# Discussion, group-work, and quiz questions

## Multiple topics

1. What is the productivity concept that unifies the following: (1) MS Word style sheets; (2) Excel formulas; (3) JavaScript programs.
2. Use the terms flowchart, pseudocode, JavaScript, and HTML to contrast the concepts of web-page formatting, algorithm design, and source code.
3. Describe how a business might use spreadsheet software to make its development of a business plan more efficient.
4. What is the role of information technology in creating and executing business plans?
5. What software could you use to create a detailed business plan, and how?
6. Explain the notion of a *named style*, giving examples from MS Word and HTML.
7. What are the differences and similarities among a *heading*, a *page header*, and a *slide footer*?
8. Compare IF as used in Excel and in JavaScript.
9. Describe the *languages* presented in the following topics in this course: Hardware; Spreadsheets; Database; Networked Computing; Web Design; Problem Solving and Programming.
10. Contrast HTML to JavaScript.
11. How is JavaScript used, with reference to HTML?
12. For topic __, see your group-work submission.
    (a) What were the main concepts presented in the course that this group work exercised or reinforced for you?
    (b) Discuss briefly any errors in your group work for this topic.
    (c) Critique the group-work submission that appears just after yours on the Discussion Board. (If yours is last, critique the first submission.)
13. Referring to chapter __ of Parsons-Oja,
    (a) What are the main IT concepts presented?
    (b) What are the main concepts presented in the topic of this course for which the chapter was assigned?
    (c) Compare and contrast the textbook presentation with what was presented in the classroom and the slides.

# Introduction

1. What is IT for?
2. What would you like to use it for?
3. How does it use you?
4. What is computing?
5. What is information?
6. Which definition of information technology do you think is best?
7. How do a user avoid repetitious tasks like formatting text the same way over and over?
8. What will you do in 5 years when you have to learn an app that doesn't exist today?
9. Are these instances of information technology? (a) laser pen; (b) cell phone
10. What is digital input, output of (a) inkjet printing process; (b) cell phone; (c) display of a film on a computer

# Topic 1 (Formatting)

1. (Group work) Download or register for an application suite among the following: Ajax Write (and others in Ajax suite); Google Documents; OpenOffice. Compare features and user interfaces. Find what features that you use already are supported in these alternative suites; find out what features that are listed in the Semester Project, #1 and #2, are supported. Compare styles of user interface with MS Office. Say what characteristics you like and don't like. Write up results of your work as a PowerPoint or as presentation notes, and post on Discussion Board, Topic 1 (Formatting) under this Group Work forum. Include names of students who participate in your group. Organize your group with roles including those of expeditor, recorder, and reporter. Be ready to report in class.
2. (HTML Group Work) Using SharPoint, FrontPage, or Windows Notepad as a text editor, create from scratch a web page in HTML that uses material about your business or organization. The web page should contain:
   a) a *comment* at the top of the HTML file (but invisible in the web page display), that gives your name, the date, the course number, and the homework number;
   b) a *title*, to appear in the blue bar at the top of the Internet Explorer window;
   c) multi-paragraph text, some of which is bold or italicized and some of which uses *headings styles* such as <h1>, <h2> (see *HTML Reference* handout);
   d) a hyperlink (e.g., to a web site related in some way to your organization or business);
   e) a picture (your logo), scaled to about 1 or 2 inches high as displayed on your monitor (or about 100 x 100 pixels);
   f) a horizontal rule;
   g) a background color;
   h) an HTML *table* coded from scratch containing some info from the MS Word table that you created for HW 2.
   i) a bulleted or numbered list;
   j) a definion and uses of the <h1> style;
   k) a table of contents using internal hyperlinks.

   *To retrieve example files posted on Discussion Board:* open the example message, right-click on the .htm file name, save the file at your user account space, open it in MS Office Sharepoint Designer.

   Code your work in the Code view of Sharepoint. To be sure that your HTML file appears as you intend, use Design View. Double-click on your HTML file in its directory to show it in a browser.
3. Why are MS Word named styles used, rather than just formatting blocks of text with the Font and Paragraph dialogs?
4. What are some file formats supported by the word-processing application you use?
5. Compare bitmap and vector formats for pictorial data.
6. For the same simple drawing, would a .GIF file or a .BMP file be larger, and why? (GIF can be exported from PowerPoint, whereas Paint generates .BMP.)
7. What features are possible with a table that are not possible with simpler formatting methods like tabs?
8. Describe how you might format a long word-processing document in such a way that the font of the subheadings can easily be changed later.
9. In web-page construction software, such as FrontPage, what are the HTML view and Preview modes used for?
10. Name two kinds of information that must be specified to create a hyperlink, and tell what a hyperlink is used for.
11. What is an HTML tag? Give examples.
12. Circle the event handler in the HTML code below [see examples].
13. Circle the line of the HTML code below that puts words into the blue bar at the top of a displayed web page. [code]
14. What is an HTML comment?
15. Distinguish the <head> tag from <h1> in HTML.
16. What are attributes of an effective slide presentation?

17. How can a word-processor document be formatted to communicate well?
18. What are some features of your word-processing or presentation app that enable flexibility?
19. Compare MS Office with OpenOffice, Star Office, or some other office suite. To do this, you may have to download and install the other office suite.
20. Why are there:
    (a) word-processor programs
    (b) standard user interfaces
    (c) changes in standard user interfaces
    (d) alternatives to MS Office
    (e) languages like HTML
    (f) named styles

### *Short answer*

1. Why is an HTML file readable on Notepad?
2. What formatting feature is needed when generating a table of contents in MS Word?
3. What do PowerPoint Master Page and Microsoft Word Page Header View have in common?
4. What method for spacing is considered better than pressing the Enter key twice?
5. How are all the slides in a presentation given a common format?
6. What does "export" mean, in a desktop application?

### *Multiple choice*

1. An MS Word named style is like the PowerPoint Master Slide View in that (a) it is stored on disk; (b) it is stored in the processor; (c) it is hardware; (d) it offers global control of format; (e) none of these
2. Which of the following is considered a graphical file format? (a) *.xls*; (b) *.ppt*; (c) *.gif*; (d) *.exe*; (e) all are graphical file formats
3. An internal hyperlink is different from an external one in that (a) it references a location in the same file that contains the hyperlink; (b) it is in the HTML file; (c) it is on the server; (d) it is on the user's computer
4. The screen image in a Windows system may be saved to the Clipboard using (a) Paint; (b) Copy; (c) PrtScr; (d) NumLock; (e) none of these
5. The MS Office 2007 interface has (a) a menu named "File"; (b) keyboard shortcuts for every command; (c) customizable menus everywhere; (d) a context-sensitive Ribbon with command groups; (e) none of these
6. Which of the following is not an office suite? (a) Windows; (b) MS Office; (c) Google Docs; (d) Open Office; (e) all are office suites
7. Automatic generation of tables of contents requires (a) user knowledge of the subject matter; (b) artificial intelligence; (c) use of named styles for chapter headings; (d) special formatting of footers; (e) none of these
8. Named styles (a) are particular to MS Word; (b) are particular to HTML; (c) are available only in PowerPoint; (d) are common to word processing and HTML; (e) are an oxymoron
9. In an HTML file, the <body> information (a) is not visible; (b) is shown in the title bar; (c) contains definitions; (d) is shown in the browser window; (e) none of these
10. In web pages, images are normally (a) embedded in an HTML file; (b) stored in separate files from the HTML file; (c) inaccessible; (d) stored in PDF files; (e) none of these
11. Tables (a) have no special formatting; (b) are supported by Word but not HTML; (c) are supported by HTML but not by Word; (d) are supported by Word and HTML; (e) none of these
12. Vertical spacing is considered best provided by (a) the space-after attribute; (b) pressing the space bar; (c) pressing Enter twice; (d) features only available to experts; (e) none of these

# Topic 2 (Spreadsheets)

13. Give examples of how Excel provides spreadsheet calculation features, visual presentation features, and database features.
14. What common formatting features are shared by word-processing and spreadsheet software?
15. Describe two statistical functions available in a spreadsheet application.
16. How would you find out the monthly payment due for a 30-year mortgage on a house costing $350,000 at 4.7% interest?
17. Explain why relative references are sometimes used in spreadsheets, and why at other times absolute references must be used.
18. Provide an example of the use of VLOOKUP.
19. If you had a piece of numeric data on one worksheet of a spreadsheet file, and wanted to put it into a different worksheet as well, how would you do that?
20. Explain two ways to use spreadsheet data directly within a word-processor file.
21. Describe the IF function (AND, OR)
22. What is a parameter? Give an example in the context of spreadsheets.
23. Distinguish absolute and relative references.
24. What is a *range* used for in spreadsheets?
25. How would you display the largest sales figure in a row of such figures in a spreadsheet?
26. How would you make sure that the column headers in a spreadsheet stayed on the screen even when the user scrolled the data?
27. How would you make sure that your spreadsheet data fits all on the same page when it is printed?
28. Give two reasons why it is is considered better to write formulas for sums, averages, and so forth, in spreadsheets, rather than type in all the numbers?
29. Suppose you paste a selection from an Excel spreadsheet into a Word document, and the spreadsheet grid is too wide for the page, and no column could be narrowed by eliminating space. How would you fit the data without completely reformatting it?
30. Why are formulas used in spreadsheets, when entering the numbers might be just as convenient?
31. What would you look for if you saw "#NAME?" as the contents of a spreadsheet cell?
32. How would you format a cell so that a whole sentence could be displayed in it, on multiple lines?
33. How would you cause the heading, "Budget for 2006," to appear centered above *two* columns of a spreadsheet?
34. How would you cause negative numbers to appear formatted with parentheses instead of minus signs?
35. What are the items in a journal?
36. What items to a journal and a budget have in common?
37. What items in a budget could be obtained from a journal using cell references?
38. What is an advantage of using named cells in a spreadsheet?

*Write formulas to calculate:*

39. *Monthly payment* required on a thirty-year loan of $550,000, at 7% annual interest
40. *Sums* of each row and each column of a grid of numbers representing each of three products sold in each of four quarters:

```
159  250  195  690
346  883  790  686
276  292  337  192
```

41. *Median* value of a list of values displayed horizontally: 100, 40, 0, 30, 300
42. Number of non-empty cells in a range (e.g., for attendance at meetings:)

```
Jan. 2  Jan 9   Jan. 16  Jan. 23 Attendance
          x                x        2
```

43. Use a lookup table and formula to apply the labels "vapor", "liquid", or "ice" to the following observed water-temperature values (in ºF): 100, 40, 0, 30, 300.
44. Why are there:
    (a) spreadsheet software
    (b) spreadsheet formulas

### *Short answer*

1. How would you make sure that the value for ten dollars appears exactly as "$10.00" in a spreadsheet?

2. What does "#####" in a cell mean? How do you fix it?
3. Write a spreadsheet formula that displays the average of the values in cells B3, B4, and B5.
4. How is an MS Word named style like a formula in Excel?
5. What does "B5:C8" specify in Excel?
6. If the formula "=B2+C2" is copied from cell D2 to D3, what will the new formula be?
7. If the formula "=F6+E$5" is copied to the cell below the cell containing the formula, what will the new formula be?
8. What does "=budget!C6" refer to?
9. What kind of chart would be appropriate for the expense categories of a business?
10. What kind of chart would be appropriate for displaying spending on education for the years 2001-2005?

### *Multiple choice*

1. B3:G3 is a (a) value; (b) format; (c) range; (d) formula; (e) none of these
2. A well-designed budget spreadsheet may well contain a cell (a) that references a value computed in the non-budget part of the spreadsheet; (b) that contains a range as its value; (c) that literally contains a number that could be computed from another number in the budget; (d) that references another cell that references the current cell
3. To solve a loan amortization problem with a spreadsheet, it is sufficent to use (a) the SUM function; (b) a range; (c) an expression that uses the operations of addition, subtraction, multiplication, and division; (d) the PMT function; (e) none of these is sufficient
4. An Excel filter corresponds to (a) a query; (b) a script; (c) a formula referencing a cell; (d) a JavaScript program; (e) an HTML file
5. Which of the following may *not* be in the cell of a spreadsheet? (a) a function definition; (b) a formula; (c) a function call; (d) a literal numeric value; (e) a label
6. Absolute and relative references are found in (a) PowerPoint slides and Word files; (b) logic gates and assembler code; (c) hyperlinks and spreadsheet formulas; (d) pivot tables and filters; (e) all of these

# Topic 3 (Database)

1. What is a database table?
2. What is required for an efficient search of a database?
3. What is database filtering?
4. What is a way in MS Excel to find the correlation among values of fields in a database table?
5. Distinguish a pivot table from a database relation or table.
6. What do columns in a database table represent?
7. What do rows represent in a database table?
8. In a pivot table, where do the independent variables go? The dependent variables?
9. What is a database query?
10. Contrast selection queries with projection queries.
11. Give a case where a database table may represent a relationship between two entities.
12. Referring to slide 10 (Entity-Relationship Design), design a database to represent three entities, each entity represented by one table with a primary key. The entities are: customers, products, transaction detail. Detail is one instance of a product purchased, possibly along with other products. Describe the relationships among these entities. Create a small Excel table for each entity.
13. Following the pattern in the previous question, where the third entity represents a joining of one instance of each of the other two entities, design three-table databases for the following:
    (a) job applicants being hired for jobs, so that a sheet can be generated with information about all the new hires for a given period of time;
    (b) poems being published in journal issues, so that a sheet can be generated listing all the poems published for a given journal issue;
    (c) attendees signing up for workshops at a research conference, so that a report can be generated listing all the attendees at a given workshop;
    (d) home buyers visiting open houses, so that a list can be generated of all the home buyers who visited a given house;
    (e) customers buying CDs at music stores, so that a sales slip can be generated;
    (f) CD vendors selling shipments of music to music stores, so that a vendor can list all the shipments made to a certain music store.
14. With copies of the table in *listing.xls*, perform filter operations to
    (a) select all listings for electric-heated homes in Framingham and Natick with 3 bedrooms or fewer;
    (b) show how many homes there are with each number of bathrooms available;
    (c) show average cost of Wellesley homes;
    (d) show cost of the most expensive listing in Wayland
    (e) select all listings for colonial-style homes in Framingham.
15. Create pivot tables to do the following, with reference to *listing.xls*:
    (a) show the effect of number of bedrooms and bathrooms on maximum cost
    (b) show the the average costs of houses, by number of bedrooms and number of acres of land.
    (c) show the numbers of houses that are listed, by town and heating type
    (d) show the average costs of houses, by architectural style and town
    (e) show the effect of the lot size and number of baths on minimum cost
    (f) Find total values of oil-heated listings in Natick under $300,000.
16. What important feature of good database design may *listing.xls* not appear to have? Give arguments that it hs the feature and arguments that it doesn't.
17. Why are there:
    (a) database management systems
    (b) database design principles
    (c) primary keys

### *Short answer*

### *Multiple choice*

1. To assure that all records are different, database designers use (a) a sort field; (b) queries; (c) data analysis (d) searches; (e) a primary key
2. In a pivot table, (a) independent variables are correlated with each other; (b) dependent variables are correlated; (c) the effect of independent variables on dependent ones is shown; (d) the effect of dependent variables on independent ones is shown; (d) none of these
3. A database normally consists of (a) pixels; (b) tables; (c) keys; (d) protocols; (e) none of these
4. A selection query corresponds to (a) a table; (b) a view; (c) a logical assertion; (d) a set of records; (e) all of these
5. Which of the following is *not* associated with database management? (a) query design; (b) table design; (c) global control of formatting; (d) entities and relationhips; (e) all of these are associated
6. In databases, an object or instance correspondes to a (a) record; (b) table; (c) bit; (d) relation; (e) all of these
7. In databases, an entity or class of objects is implemented by a (a) record; (b) table; (c) bit; (d) relation; (e) all of these
8. To display information from a database, we use a (a) format command; (b) named style; (c) master page; (d) query; (e) all of these
9. Non-duplication of data in tables is enforced by use of (a) formulas; (b) primary keys; (c) formats; (d) protocols; (e) all of these
10. A database table's columns correspond to (a) records; (b) tables; (c) instances; (d) attributes; (e) all of these

## Topic 4 (Hardware and Operating Systems)

1. What are some significant ways that processor-based systems as used in IT differ from living organisms?
2. Relate processor, RAM, and I/O.
3. Contrast two or three categories of physical media or devices used in data storage.
4. In what way is the binary system of numerals relevant to information technology?
5. Support or refute: All information processed or communicated by information technology takes a common form.
6. In what way may it be said that bits have no meaning, in themselves?
7. How is it possible for a single processor to execute multiple computer programs concurrently?
8. In what sense does an operating system *manage memory*?
9. Explain how when you use a program like MS Word, you sometimes are making use of the Windows operating system.
10. What is a file?
11. What is a folder?
12. How many bits are there in a kilobyte?
13. Is a shortcut to a folder itself a folder? Explain why or why not.
14. When we speak of your "Y: drive," in My Computer, are we speaking of a physical disk drive? Explain.
15. What is a dialog box? A pop-up menu?
16. Distinguish radio buttons from check boxes.
17. In what part of an IT system is the *arithmetic logic unit* found and what else is found there?
18. Relate the following concepts: bits, characters, 32-bit words, bytes, registers, and megabytes.
19. What is a way that analog information is converted to digital form? Digital to analog?
20. Contrast digital and analog devices, giving one example of each.
21. What are some features of a machine language as opposed to a different kind of language?
22. What are the smallest elements of a color image displayed on a monitor, and how are the colors represented?
23. Where is the program counter and what does it do?
24. Give an example of random access and an example of sequential access.
25. Are all the files in a folder located in the same part of a disk? Explain.
29. Convert to decimal: 110, 1010101; 1111000; 110011; 111010
30. Convert to binary: 4
31. Does a bit have an inherent meaning? Why/why not?
32. Distinguish an analog device from a digital one.
33. Order the following according to distance from the user's perception: operating system, application, hardware
34. Order the following according to distance from the processor control unit: cache, hard drive, RAM, program counter, accumulator
35. What two *kinds* of components does a port connect?
36. A device driver provides the interface between what kind of software and what kind of hardware?
37. In Windows and some other user interfaces, what does right-clicking on an object enable the user to do?
38. Distinguish the functions of the Backspace and Delete keys.
39. Relate the following: mouse pointer, cursor, Insertion Point.
40. What does the Clipboard store and in what part of the hardware is the Clipboard located?
41. What steps are recommended, in order, if an application stops responding?
42. How do you make a window disappear while leaving it available in the Task Bar?
43. Since Word documents and web sites contain data, why could it be more risky to open a Word document or to click a Web link than to open a text file?
44. What happens if you double-click a file whose name ends, ".exe"?

*Carry out these operations:*

45. Check free disk space
46. Rename file
47. Sort directory by date, by file name

48. Control directory view to show file names and dates at left
49. Create folder, move files to folder, move folder
50. Create shortcut
51. View print queue
52. Create folders in your network student account area for files associated with this course and other projects. Design a file organization for your materials. For example, you may wish to create folders within the course folder for each topic, or a folder homeworks and one for the project, etc. Submit a screen shot of your student account file directory using Word or Paint.
53. Download the program *asm_setup.exe* (see below) and use it to install the program *asm.exe* in your student account (see below). Run *asm.exe,* and use it to step through the program *xy.asm* (below, and available in Blackboard under Course Documents), choosing step mode. To open *xy.asm* within *asm.exe*, use File / Open.

```
        input   x
        load    x
        add     x
        add     x
        store   y
        print   y
        stop
x       data    0
y       data    0
```

Test the program for two or more different input values.
(a) From your observation, what occurs when the fifth line of the program, *store y,* executes?
(b) Based on your observation, write a formula that accurately describes the relationship between input and output of program *xy.asm*. (Your formula could be of the form "Output is *n* larger than input," or "Output is random," or "Output is same as input.")
(c) Suggest a name for the program that describes what it does better than the name *xy.asm,* and better names for the data labels *x* and *y*.
(d) Using a text editor such as Notepad, copy into your homework file a listing of *xy.asm*, the program, and *xy.out*, the record of your test of the program. The file *xy.out* is created when *asm.exe* runs *xy.asm*. (*Optional:* add a comment with your answer to (b) and rename the program and variables per (c).)
54. Describe in your own words the process of executing a program at the hardware level, referring to the processor, machine language, bits, registers, RAM, and I/O.

### *Short answer*

1. What is the basic unit of information storage in a *file*?
2. Name two operating systems.
3. What is a smaller unit of information than a byte?
4. What feature is found in all instances of information technology?
5. What keypress places the screen image on the Clipboard?

### *Multiple choice*

1. In a user PC on the FSC network, the "Y: drive" is (a) a processor; (b) a physical device; (c) a folder on the user computer's hard drive; (d) located on the server; (e) none of these
2. An example of analog representation is (a) a file stored on a computer; (b) a message sent on the Internet; (c) the sound heard from an IPod; (d) a picture in RAM; (e) a register in a processor
3. A bit's value (a) is 0 to 255; (b) is 0 or 1; (c) fills a register; (d) fills a memory cell; (e) corresponds to a color pixel
4. An operating system provides services for (a) applications; (b) remote sites; (c) hardware; (d) Microsoft Corp.; (e) surgeons
5. Which is not hardware? (a) general-purpose computer; (b) operating system; (c) video game console; (d) printer; (e) all are hardware.
6. The two standard ways to access data from storage include sequential and (a) binary; (b) wireless; (c ) random; (d) arbitrary; (e) reverse.
7. Components of a CPU include (a) RAM; (b) control unit; (c ) track; (d) packet; (e) software
8. Right-clicking on an object (a) opens or executes it; (b) deletes it; (c) selects it; (d) displays its operations and attributes; (e) none of these

9. Of the following, the smallest is: (a) bit; (b) kilobyte; (c) megabyte; (d) byte; (e) word
10. Which is not an operating system: (a) LINUX; (b) Internet Explorer; (c) Windows; (d) Mac OS; (e) all are operating systems
11. All data is communicated and stored by computers in what form? (a) analog; (b) digital; (c) megabyte; (d) packet; (e) other
12. Which type of language is closest to that used by a processor? (a) query; (b) formula; (c) markup; (d) assembler; (e) transfer-protocol
13. The two standard ways to access data from storage include sequential and (a) binary; (b) wireless; (c) random; (d) arbitrary; (e) reverse.
14. Consider the following eras: (i) Internet-connected computers; (ii) mainframe computers; (iii) locally-networked PCs. Computing has proceeded from (a) i to ii to iii; (b) ii to i to iii; (c) iii to ii to i; (d) iii to i to ii; (e) ii to iii to i
15. The fastest-accessible of the following is: (a) RAM; (b) hard disk; (c) cache; (d) register; (e) web site
16. What is fetched in the fetch-execute cycle? (a) instruction; (b) operand; (c) record; (d) byte; (e) file
17. The kind of desktop display in our classroom is (a) PDF; (b) CRT; (c) LCD; (d) ABC; (e) none of these

# Topic 5 (Networked computing)

1. Describe what happens, out of your sight, when you enter a query to a web search engine.
2. In using web-based information for an academic research paper, what are some concerns researchers should have?
3. Describe some advantages and inconveniences of networked computing as opposed to the use of standalone workstations.
4. Describe your network account: How you use it and how its data is organized.
5. Distinguish the World Wide Web from the Internet.
6. In what language are web pages communicated to the browser?
7. Name advantages and disadvantages of the use of email attachments.
8. Just after you send an email, where does your message reside, physically?
9. Give two well-known transfer protocols, by initial and name.
10. What are the components of a URL?
11. What is a network server?
12. What is a web server?
13. What does the client communicate to a web server, and what does the server communicate to the client?
14. What are packets and how are they used?
15. What is an IP address?
16. Distinguish a URL from and IP address.
17. Describe some features of E commerce that differ from traditional commerce.
18. What must be assured in electronic transaction processing?
19. What is a nonlinear feature of web pages?
20. What is a browser?
21. Why would a wholesale supplier wish to create an HTML file?
22. What are two ways to invoke a URL?
23. What interaction occurs on the Internet, out of the user's view, when a URL is invoked by a browser?
24. Upload an HTML file, under the name index.htm, and your picture file, to the FSC server, following instructions on the handout, "How to create and upload HTML files at FSC." Send instructor a link to that location, via email or Digital Dropbox.
25. Describe synchronous and asynchronous cases of:
    - phone communication
    - IM
    - email
26. What are factors that determine bandwidths of different media of communication?
27. Where might middleware be used to support networked computing that you do?
28. Distinguish distributed computing, client/server computing, and Web surfing.
29. What information other than a URL would a reader of your research results want to have if the reader were interested in evaluating your research?
30. Where does an HTML file reside physically, (a) just before the page displays on your browser; (b) while the page displays?
31. Post a clipping from the Web that refers to *networked computing* in one paragraph or more. Comment briefly on it in relation to the course material.
32. Is it ethical to connect to an unknown, unsecured, wireless network? Give *technical* reasons for your answer.
33. Is file sharing more of an ethical and legal issue today than copyright infringement of media was twenty years ago? Why?
34. What transactions recorded by networked computers have you carried out today?
35. Upload an HTML file, under the name *index.htm*, to the FSC server, following instructions on the handout, "How to create and upload HTML files at FSC." Post a link to that location.
36. On your laptop, run *Spybot Search & Destroy*, which has been recommended by FSC Information Technology Services. Post a screen view of the report given.

37. *Critical Thinking*: "How do you use the Internet? What advantages does it provide for you? What are your pet peeves about the Internet as it currently works ...? What would be your ideal Internet?" (P-O, p. 292)
38. *Group Project*: "create a LAN [imaginary] to connect your [dorm] computers ... describe the number, type, and location of the computers that will form your network ... what type of network technology you want to use ... Create a shopping list of the network components you need to purchase, and then use the Web to locate prices for each item on your list" giving URLs for sites used." (P-O, p. 292)
39. *Cyberclassroom*: Ping Google from your laptop, a home machine, and a wireless laptop, record results. (To Ping, go to *Programs/Accessories/Command Prompt*, or *Programs/Run/cmd*. On the black-background window, type *ping google.com*.)
40. *Globalization*: "Suppose that you are organizing a high school debate about global communications technology... devise a controversial question on which the debate will be based. ... write 'pro' and 'con' paragraphs." Give sources you find to help support debate. *Ideas:* global access to Internet; World Bank; sharing of information; access to news reports; the Digital Divide; privacy; intellectual property; protection of children; free expression. (Relate any of these issues to concepts discussed in slides on Topic 5.)
41. *Issue*: Examine one or more aspects of the free wireless-LAN controversy, consulting e.g. the Free WLAN InfoWeb, www.course.com/np/concepts9/ch05 (you must register there to access this text).
42. *Computers in Context*: "Identify a topic you'd like to learn about [on networking], write a brief description of your topic, why it interests you, and what you would like to learn about it... use a search engine ... to locate online tutorials about your topic.... provide URLs." Provide identifying info about these sources. (P-O, 9ed., p. 293).
43. (*Individual work:*) List a few qualifications and skills you'll need for your possible ideal job (not necessarily 10) and explore the Internet for resources to help obtain those skills, listing at least two URLs related to this. (See Parsons-Oja 9ed, p. 292, "Resume Builder.")

### *Short answer*

### *Multiple choice*

1. Visiting a web site is a case of
   (a) client/server computing; (b) FTP;
   (c) database design; (d) machine language;
   (e) procedural language
2. Ethernet (a) is wireless networking;
   (b) involves shared use of a bus for all data communicated; (c) the Internet Protocol;
   (d) a form of hypertext; (e) none of these
3. Which of these is *not* a way to extend HTML?
   (a) XML; (b) CGI scripts; (c) JavaScript;
   (d) machine code; (e) all are ways to extend HTML
4. Data is always transferred on the Internet in the form of (a) packets; (b) kilobytes; (c) files;
   (d) folders; (e) queries
5. Which of the following is invoked when you type a query in Google? (a) a web crawler;
   (b) Internet Explorer; (c) a search engine;
   (d) a browser function; (e) none of these
6. The Hypertext Transfer Protocol is used in
   (a) any asynchronous communication
   (b) clicking links; (c) packet formation;
   (d) database querying on a single workstation;
   (e) email exchanges
7. Which of the following is not primarily designed to support interoperability:
   (a) HTML; (b) XLS; (c) CGI; (d) XML;
   (e) all are primarily designed for that

8. Packets are created and routed according to the standards of (a) Windows; (b) Intel; (c) the Internet and Transfer Control Protocols; (d) Internet Service Providers; (e) none of these
9. The text that will display in the user's web browser is in which section of an HTML file? (a) <head>; (b) <html>; (c ) <style>; (d) <body>; (e) none of these
10. An IP address (a) is an email address; (b) is a URL; (c) contains a domain name; (d) has 32 bits; (e) has 4 bits

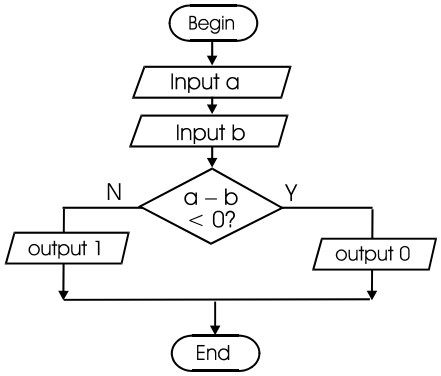
# Topic 6 (Problem solving and programming)

1. Contrast machine language to JavaScript.
2. Contrast JavaScript to HTML.
3. Describe how JavaScript and HTML may be used in the same web-resident file.
4. Write a flowchart for an algorithm that inputs twenty numbers and displays their average.
5. Trace the flowchart below [see examples].
6. What does the following JavaScript code do?
   (a) var a, b, total
   (b) x = ParseInt(prompt("Enter your age", ""))
   (c ) alert("Your age is " + x)
7. Describe two meanings of "+" in JavaScript.
8. What is an algorithm?
9. Distinguish problem specification, system design, and program coding.
10. Put each of the following into one of the shapes below (rectangle, parallelogram, or diamond): (a) count < 5; (b) display total; (c) total ← total + *x*.
11. Circle the JavaScript declaration statement below. [show code]
12. Write a JavaScript statement that displays a rectangle with the word "Goodbye" in it and an "OK" button.
13. What are two ways to express an algorithm?
14. What kind of structures are the sequence, branch, and loop, and what algorithms can they be used to specify?
15. What are the three standard control structures, sufficient to specify any algorithm?
16. What is an event handler?
17. Compare the languages of *expressions* used in Excel formulas and JavaScript code.
18. What are some aspects of a system that a system requestor or specifier must consider?
19. How is "*total* ← *total* + *x*" similar to and unlike an algebraic equation?

### *Group work*

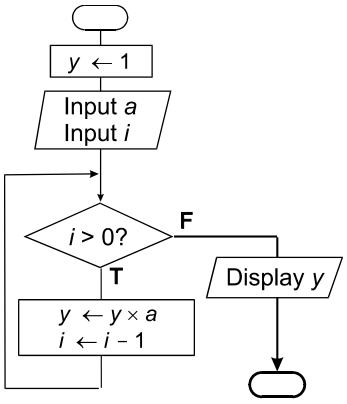
20. Consider the flowchart below. For each of the input pairs (*a*, *b*), shown below, show the resulting output:

| | ***Input** a* | ***Input** b* | ***Output*** |
|---|---|---|---|
| (a) | 2 | 1 | ____ |
| (b) | 1 | 3 | ____ |
| (c) | 4 | 2 | ____ |
| (d) | 7 | 10 | ____ |
| (e) | 3 | 2 | ____ |
| (f) | 3 | 5 | ____ |
| (g) | 6 | 2 | ____ |




Informally, what does the output of this algorithm tell about the two inputs?

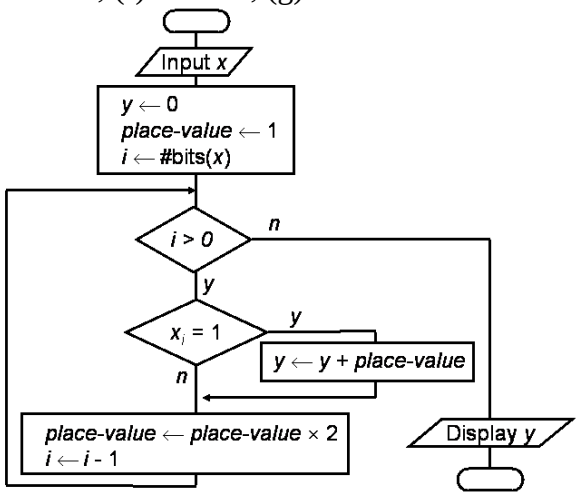
21.




Use the table below to trace the algorithm specified in the flowchart above, for inputs *a* and *i* of
(a) 2 and 3;
(b) 4 and 2;
(c) 5 and 1;
(d) 10 and 3;
(e) 12 and 2;
(f) 1 and 6;
(g) 2 and 4.

| ***a*** | *i* | ***y*** | **output** |
|---|---|---|---|
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |

22. Show a trace of this flowchart of binary-to-decimal conversion, for inputs (a) 11011; (b) 101101; (c) 101010; (d) 011001; (e) 010110; (f) 100101; (g) 100111




23. (*Challenge*) Using flowchart or pseudocode, design an algorithm or interactive process that
(a) loops to accept four numbers and displays their sum
(b) accepts two numbers and displays the larger.
(c) accepts three numbers and displays the largest;
(d) four numbers;
(e) five numbers
(f) prompts for two integers and displays their quotient, using only subtraction; show an error message if the divisor is 0.
(g) accepts a number *x* and displays the sum of all the whole numbers from 1 to *x*;
(h) accepts a number *x* and displays the product of all the whole numbers from 1 to *x*
(i) prompts for two integers and display their product, using only addition and subtraction operations in your calculations;
(j) prompts for a string and tells whether it contains any doubled-up characters.

24. Write and test programs in JavaScript whose inputs and outputs are as specified below. The program should be embedded in an HTML driver. Be sure to comment the program thoroughly, including the name of the program (HTML file name), your name, the date, and assignment number.

| *input* | *output* |
|---|---|
| (a) two numbers | their sum |
| (b) one number, *x* | $x^3$ |
| (c) two numbers, *a* and *b* | $a^2 + b$ |
| (d) two numbers | their product |
| (e) two numbers | their quotient |

25. See example file *count-yes.htm*. Modify it to create a page that works as follows:
Four buttons are displayed: "$1", "$5", "$10", "Done". The user presses the 1, 5, and 10 buttons each a certain number of times, to request these amounts. After pressing "Done," user sees a number reflecting total amount requested. To solve this problem, you need to use an expression that assigns to *OnClick* a string that starts with 'alert(', ends with ')', and contains an expression that computes the sum of the $1 amounts, $5 amounts, and $10 amounts.

### *Short answer*

### *Multiple choice*

1. In event-driven programming, an event is
(a) input; (b) output; (c) a sequence structure; (d) a program decision; (e) something that happens during web-site development
2. Which is *not* a feature of algorithms?
(a) precision; (b) finiteness of time; (c) step-by-step sequencing; (d) limited set of possible inputs; (e) definiteness of result
3. Which is *not* a way to express an algorithm?
(a) HTML; (b) JavaScript; (c) flowchart; (d) pseudocode; (e) machine code
4. Which of these is a control structure?
(a) hyperlink; (b) Excel worksheet; (c) database table; (d) loop; (e) register
5. Algorithms (a) are efficient; (b) take finite time; (c) are languages; (d) are a kind of program; (e) none of these
6. Design tools include (a) output; (b) flowcharts; (c) registers; (d) queries; (e) none of these
7. The loop is a (a) language; (b) control structure; (c) data structure; (d) program; (e) none of these
8. The branch is a (a) language; (b) control structure; (c) data structure; (d) program; (e) none of these
9. Control structures are used in (a) design; (b) output; (c) input; (d) formatting; (e) none of these

10. A trace of an algorithm provides (a) input; (b) a list of errors; (c) snapshots of the state of the algorithm over time; (d) a view of a table; (e) none of these (a) ; (b) ; (c) ; (d) ; (e) none of these
11. One language used for design of interactive systems is (a) HTML; (b) machine language; (c) database query language; (d) UML; (e) none of these
12. JavaScript encodes (a) web-page formatting; (b) responses to input events; (c) database design; (d) statistical analysis; (e) none of these
13. JavaScript code is likely to appear in (a) spreadsheet formulas; (b) processor registers; (c) database queries; (d) HTML files; (e) none of these
14. Variables may be assigned values in (a) JavaScript statements; (b) spreadsheet formulas; (c) named styles; (d) packet transmission; (e) none of these
15. Modular decomposition of processes is most closely associated with which kind of design? (a) web-site formatting; (b) spreadsheet; (c) database; (d) algorithm; (e) none of these
16. Of the following, which is a high level programming language? (a) assembler; (b) HTML; (c) machine; (d) JavaScript; (e) none of these

# Topic 7 (Social-professional)

1. Discuss a problem related to privacy or intellectual property issues, making reference both to technical factors and to ethical concerns.
2. How are movies on the web different from journals on the web w.r.t. intell. prop.?
3. Should plagiarism be criminalized? (Defend or refute.)
4. Should unauthorized software copying be criminalized? (Defend or refute.)
5. Should copying to avoid charges of plagiarism be considered fair use? (Defend or refute.)
6. Is limited access to some research materials on the Internet (in contrast to free library access) a problem? (Defend or refute.)
7. Is copyright a matter of policy (choices of preferred outcomes) or ethics (S. Warwick) (Defend or refute.)
8. Why should one person have exclusive rights over something that everyone could possess and use at once? (Hettinger)
9. Are rights of attribution (author recognition) and integrity (non-alteration) more important than other intellectual property rights?
10. Should electronic publishing have more, less, or the same copyright support as print publishing?
11. Should author gain more rights to authorize republication of work? (Defend or refute.)
12. Does cyberspace have unique features that justify different speech protections for sexual material? (Spinello, Tavani, p. 119)
13. Does the opportunity to broadcast negative messages to a large Internet audience preclude strong legal protection from defamation? (S&T)
14. Should simulated child pornography receive First Amendment protection? (S&T)
15. Is there a natural human right to privacy? (Defend or refute.)
16. What new privacy issues are raised by the information revolution?
17. Which aspects of the information revolution raise new privacy issues for discussion?
18. Does the IT revolution favor communitarian views, liberalistic views, or a mixture?
19. What are the main technical and integrity concerns raised in the controversy over electronic voting? (See handout, “Security of Electronic Voting is Condemned.”) You may give your opinion and support it.
20. What are the social implications of IT that could affect you? Describe what technical and legal assurances you would like to be in place to protect your computer’s security, your personal privacy, intellectual property that you create, and your right to share information with friends.

### *Short answer*

### *Multiple choice*

1. System integration (a) connects users for job networking; (b) involves data sharing in a large organization; (c) is not part of enterprise computing; (d) is the purpose of most database queries; (e) none of these
2. A major factor in raising ethical and legal issues is (a) malleability of information; (b) accuracy of processing; (c) hard-disk speed; (d) interoperability; (e) none of these
3. A major factor in raising ethical and legal issues is (a) unreliability of communication; (b) accuracy of processing; (c) opportunities for anonymity; (d) interoperability; (e) none of these
4. A major factor in raising ethical and legal issues is (a) unreliability of communication; (b) accuracy of processing; (c) hard-disk speed; (d) cheap copying; (e) none of these
5. A major factor in raising ethical and legal issues is (a) unreliability of communication; (b) ease of communication; (c) hard-disk speed; (d) cheap copying; (e) none of these
6. The social purpose of awarding intellectual property rights has been (a) to enable maximum profit; (b) to encourage innovation; (c) to discourage sharing; (d) to discover geniuses; (e) none of these
7. Fair use is (a) justice; (b) copying for purposes of comment or research; (c) copying for resale;

(d) use of copyrighted data at a fair price; (e) none of these

8. Privacy in the electronic era includes (a) anonymity at all times; (b) control of dissemination of personal information; (c) sufficient time alone; (d) freedom from exposure to undesirable ideas; (e) none of these
9. Privacy issues are raised directly by IT due to the (a) existence of data storage media; (b) existence of digital processing; (c) ease of copying and communication; (d) existence of curiosity; (e) none of these

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# Semester project

The semester project consists of a formatted text document, a slide presentation, a spreadsheet, a database table, and a web page. The project will begin by professionally describing a real or imaginary business or other organization and will include a slide presentation about the organization or one of its activities or products, a financial journal, a budget, financial charts, a contact database, and a simple web site.

1. Write a description of a real or imaginary business or other organization. Your description should contain multiple sections with headings and should contain at least one bulleted list.
   a. *Define* and use appropriately named *MS Word styles** for:
      i. A section heading, for which you should *modify* the predefined "Heading1" style, using a colored font;
      ii. A paragraph format, named using your last name;
      iii. A bulleted text list.
   b. Automatically generate a *table of contents* at the top of your document.
   c. At the end of your document, generate a mini-index with at least three entries.
   d. Use page headers and/or footers with pagination. Page header should include your name, the course number, the date, instructor name, and assignment number (i.e., 2). All homeworks should include this identifying information somewhere.
   e. Include a *table*** with multiple rows and columns; this table may, for example, list people in your organization with phone extensions.
   f. Include a section in some part of your document with multi-column formatting.
   g. Paste logo (see #2(b)) into your document near the top.

   Use your imagination. Submit the *.doc* file to your E Portfolio folder for this course.

2. Create a professional-type slide presentation of at least five slides about your organization, or about one of its products or activities. Submit the *.ppt* file. Make the following part of the slide show:
   a. Slide footers with slide numbers;
   b. Using the drawing tools in your presentation-graphics software, and using a separate PPT file, create a *logo* for your organization (it can be as simple as a letter or set of initials with a word underneath it), and save this image (just one slide) as a .GIF or .WMF file. Then import that file into your master slide view as a picture, so that a small image of your logo will show on each slide.
3. Create a spreadsheet file for your business or organization. Begin by choosing a set of budget categories, for income and expenses. *Use formulas wherever appropriate*. Items a-c below should be part of the spreadsheet file. Format all numeric cells with the "accounting" option.
   a. Create a financial *journal* that records transactions, one per row (see slides). The columns should correspond to budget categories for your business or organization (not for a student). Each column should have a cell that stores total income/expenses for that category. The journal should record the net amount for each transaction (the sum of all income sub-transactions minus the sum of all expense sub-transactions) and the current balance after each transaction. Unlike in the classroom example file provided by instructor, your journal should have the beginning balance in a *named* cell. The balance after a given transaction should be computed as the beginning balance (using the name in your formula), plus the sum of all the transaction amounts from the beginning balance to the current

transaction. This is a different way to compute balances that will end up being the same as if they were computed as in the classroom example.

b. Create a *budget* sheet, in a separate worksheet from the journal, that lists income and expense categories, with amounts, plus total income and expenses, with net surplus/deficit. In addition to a *projected* column (the budget), the sheet should have an *actual* column, using formulas that reference the category-total cells in the *journal* worksheet for each budget category.

c. Generate bar and pie charts that help the viewer analyze the income and expense budget categories. These should include proper labeling of values so that a person looking at a chart will understand it.

d. Create a Word document that briefly describes your budget and has the budget spreadsheet embedded.

4. Using a text formatter that exports HTML, or a web-page editor, create a simple web page in HTML format that publicizes your organization or business. Include at least one hyperlink to an existing site on the web that is relevant in some way to your business or organization. You may do this exercise by opening the file created for #1 and saving it using Save As, choosing "Web page" as the file type.

5. Create an Excel file that is a contact or employee database related to your organization or business.

   a. Use column heads to name the attributes. Include a column that will store a data item that fits the description of a *primary key*.

   b. Write a paragraph, formatted in Excel across several columns, with word wrap, describing this table using the database terminology presented in Topic 4. In this paragraph say what is the *sort field* used in the table, and state which column is the primary key and why it is satisfactory as the primary key.

### *Submission*

The project should be submitted in two forms: electronically and in hard copy.

a. Submit electronically via an E-portfolio, with the course number in its name, in your Blackboard Content System. Give your portfolio the *shared* attribute (a URL will be sent to the instructor). For E-portfolio instructions, see a posting at end of semester. For preliminary submission, send an email with multiple attachments.
b. Submit bound in a *thin* (softcover) binder, with a table of contents and a cover page. The four components (flyer, slides, journal/budget, web page, database) should be separated by labeled tabs.

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*For info on MS Word styles, see handout, "Creating a named style," and see, e.g.: http://www.microsoft.com/office/previous/xp/columns/column14.asp

**For a tutorial on MS Word tables, see, e.g.: http://www.baycongroup.com/word2003/word07.htm

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# Intro Homework (not assigned F07)

See Parsons-Oja, p. 56, “Critical Thinking” project. Write one or two paragraphs describing the topics that are most and least interesting to you. Post your paragraphs at *http://framingham.blackboard.com*, 63.120 Intro to Information Technology, Communications / Discussion Board. You may also give your reasons for taking the class, any particular expectations you wish to mention, and your questions about the class. (This sort of communication is always welcome by email at any time.)

Your comments in the Discussion Board are public within the class. If you prefer to submit this homework privately to the instructor, send via the Drop Box in a file whose name begins with your last name.

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# Homework for topic 1 (formatting)

Due: 9/14

Write a paragraph briefly describing your background knowledge of text formatting and drawing software such as MS Word and PowerPoint, and stating any expectations you have for learning about these topics in this course. Post at *http://framingham.blackboard.com*, 63.120 Intro to Information Technology, Communications / Discussion Board / Homework 1.

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# Homework for topic 2 (Spreadsheet)

Due: 9/27

Find a clipping on the Web with a table of numbers that reflect business planning or financial reporting. You may use a newspaper or magazine article, or a report at a corporate site. In a brief comment, tell which figures are dependent on other figures in the spreadsheet. Post at Discussion Board / Homework 2.

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# Homework for topic 3 (Database)

Due: 10/12

Find a clipping on the Web that contains a table of information formatted with attributes as columns and instances as rows. Identify the attributes and tell whether any of them is a primary key. Post this at the Discussion Board, topic 4. Be ready to discuss in class. Comment on some other student's posting. Post at Discussion Board / Homework 3.

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# Homework for topic 4 (Hardware and operating systems)

Due: 10/26

Find a clipping of a news item about computer hardware or operating systems on the Web. You may use any search engine or any news source you choose. You may search on any keyword that's relevant, including keywords listed on the slides about hardware and operating-systems concepts (terminology). On the Discussion Board, post the clipping, with source, including URL and any title, together with a brief descriptive paragraph you write about your clipping. Be prepared to describe the item in class. Comment briefly on the Discussion Board about someone else's clipping.

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# Homework for topic 7 (Social/professional issues; lifetime learning)

Due: 12/7

Post on the Discussion Board a clipping from the Web that refers to social or ethical issues raised by information technology; describe briefly. Be ready to discuss this in class.