Please write a documented research paper of at least 600 words on a topic chosen by your and approved by me. Sources should be peer-reviewed or from edited periodicals, conference proceedings, or books. Include references within the text of your paper and a bibliography at the end in standard bibliographic format, including author name and publication information.

Research should be in some area covered by the course, with meaningful references to the course’s textbook, sources, or handouts. Reference to the course material will be an important aspect of the research paper. Some technical aspect about AI research should be included.

The work will be done in three stages, each time with feedback.

Submit all items with your name, date, course number and name, my name, university name. Paginate your paper and subdivide it into sections.

Proposal (due October)
Include:

- title (which like anything else in your proposal, you may change later);
- initial abstract: a paragraph or so about the topic, including some factual assertion about the topic and and optionally a statement of what you hope to learn);
- short initial list of 2-3 sources in bibliographic format (see syllabus). Include at least one non-encyclopedia academic source (journal paper, conference paper, non-textbook scholarly book).

For links to papers with sample abstracts and sample bibliographic format, see www.framingham.edu/faculty/dkeil.

For information on formatting and documenting research see, for example, http://owl.english.purdue.edu/handouts/research/r_apa.html or http://webster.commnet.edu/apa/apa_intro.htm.

Preliminary draft (due November)
Draft, to be submitted in April, should respond to instructor comments on proposal, and should be at least 300 words. Embed references. Use diagrams to illustrate points made.

Final draft (due December)
Final draft should respond to instructor comments about preliminary draft and should be worthy of posting at instructor’s web site.

Desired features of research papers
- organization
- presentation
- definition of terms
- abstract, with research question or thesis
- relevance to course material technical aspect
- social or philosophical aspect (optional)
- writing
- specific factual evidence to support thesis
- acknowledgement of alternative views (optional)
Exercises for Introduction and Background

I. Response to classroom discussion

In sentences, please describe the following, based on your reading, the slides, or the class discussion about this topic:

a. an idea that you haven’t considered in the same way before;

b. a concept that is least clear to you.

II. Self-introduction and reading reflection

A. Please post a reply to the message “Self-introduction” at the Discussion Board, topic “Introduction”, giving some information about your interests and your background in computing, including knowledge of programming languages.

Also, you are invited to express any expectations or questions you have about CS I and introduce yourself in other ways: sports, hobbies, work, family. (See questions on slide 2 of the Introduction slide set.)

You may wish to post a link to your Blackboard Home Page.

Option: Give some tentative answers to questions on slides 3-4 of the Introduction slide set.

B. What did you notice about your reading? What was new, or particularly useful to you? Would you suggest changes? Please give specifics.

III. Group work and presentation

Do the following after taking the Pre-Test, and depending on the results of the test.

Form a group with two other students in the class. Divide the questions listed under “Background Concepts” in the list headed, “Problems on Introduction and Background,” that correspond to your group number, so that each group member has one question.

Prepare presentations on solutions to the problems. Presentations may describe an effort to solve the problem and may request help in this effort.

Give your group number and restate each problem with your solution.

Submit problem solutions as one batch for the group, with the names of group members who solved the problems or who helped to solve them.

IV. Individual work on problems that assess background concepts

For each background-concept objective that you would like to study more (for a make-up version of the Pre-Test), please submit a solution on paper to a member of the problem set, corresponding to your classroom number (last digit if necessary).
Exercises for topic 1

I. Response to classroom discussion
   In sentences, please describe the following, based on your reading, the slides, or the class discussion about this topic:
   a. an idea that you haven’t considered in the same way before;
   b. a concept that is least clear to you.

II. Reflection on reading
   What did you notice about your reading? What was new, or particularly useful to you? Would you suggest changes? Please give specifics.

III. Problems on core outcomes
   From each of the headings under “Problems on topic 1” marked “core” in the heading, solve the problem whose number corresponds to your student classroom ID (See “My grades” for your ID.) If not enough questions are listed, use the last digit of your classroom ID or wrap around to the beginning of the list of questions. Restate problems as the first step of solving them.

IV. Group work and presentation
   Divide the non-core subtopic outcome problems among group members, so that for each subtopic outcome, at least one group member solves a problem.
   Share solutions to problems with other group members, helping each other see how you solved your problems.
   Also, support a group member to prepare a presentation of at least one problem solution. If your group cannot solve a certain problem, describe an effort to solve the problem and request help in this effort. Choose one member of your group to present the solution in class. Rotate in this role from topic to topic.
   For each group member to do: Describe the group process briefly.

V. Glossary (optional, extra credit)
   See heading, “Terminology,” above the Topic 1 problems. Review the terms numbered with the same last digit as your classroom number. See wiki, “Glossary,” at Blackboard, Course Tools / Wikis. Define any undefined term you find or review the definition of a term that corresponds to your classroom number and correct or improve the definition if appropriate. Put your name after the definition, and any sources you used.
Exercises for topic 2

I. Response to classroom discussion

In sentences, please describe the following, based on your reading, the slides, or the class discussion about this topic:

a. an idea that you haven’t considered in the same way before;

b. a concept that is least clear to you.

II. Reflection on reading

What did you notice about your reading? What was new, or particularly useful to you? Would you suggest changes? Please give specifics.

III. Problems on core outcomes

From each of the headings under “Problems on topic 2” marked “core” in the heading, solve the problem whose number corresponds to your student classroom ID (See “My grades” for your ID.) If not enough questions are listed, use the last digit of your classroom ID or wrap around to the beginning of the list of questions. Restate problems as the first step of solving them.

IV. Group work and presentation

Divide the non-core subtopic outcome problems among group members, so that for each subtopic outcome, at least one group member solves a problem.

Share solutions to problems with other group members, helping each other see how you solved your problems.

Also, support a group member to prepare a presentation of at least one problem solution. If your group cannot solve a certain problem, describe an effort to solve the problem and request help in this effort. Choose one member of your group to present the solution in class. Rotate in this role from topic to topic.

For each group member to do: Describe the group process briefly.

V. Progress on semester project

Please read the research paper description and consider possible topics. Nothing to turn in.

VI. Glossary (optional, extra credit)

See heading, “Terminology,” above the Topic 2 problems. Review the terms numbered with the same last digit as your classroom number. See wiki, “Glossary,” at Blackboard, Course Tools / Wikis. Define any undefined term you find or review the definition of a term that corresponds to your classroom number and correct or improve the definition if appropriate. Put your name after the definition, and any sources you used.
Exercises for topic 3

I. Response to classroom discussion
   In sentences, please describe the following, based on your reading, the slides, or the class discussion about this topic:
   a. an idea that you haven’t considered in the same way before;
   b. a concept that is least clear to you.

II. Reflection on reading
   What did you notice about your reading? What was new, or particularly useful to you? Would you suggest changes? Please give specifics.

III. Problems on core outcomes
   From each of the headings under “Problems on topic 3” marked “core” in the heading, solve the problem whose number corresponds to your student classroom ID (See “My grades” for your ID.) If not enough questions are listed, use the last digit of your classroom ID or wrap around to the beginning of the list of questions. Restate problems as the first step of solving them.

IV. Group work and presentation
   Divide the non-core subtopic outcome problems among group members, so that for each subtopic outcome, at least one group member solves a problem.
   Share solutions to problems with other group members, helping each other see how you solved your problems.
   Also, support a group member to prepare a presentation of at least one problem solution. If your group cannot solve a certain problem, describe an effort to solve the problem and request help in this effort. Choose one member of your group to present the solution in class. Rotate in this role from topic to topic.
   For each group member to do: Describe the group process briefly.

V. Progress on semester project
   Please turn in the Proposal for the research paper.

VI. Glossary (optional, extra credit)
   See heading, “Terminology,” above the Topic 3 problems. Review the terms numbered with the same last digit as your classroom number. See the wiki, “Glossary,” at Blackboard, Course Tools / Wikis. Define an undefined term you find, or review the definition of a term that corresponds to your classroom number and correct or improve the definition if appropriate. Put your name after the definition, and any sources you used.
Exercises for topic 4

I. Response to classroom discussion
   In sentences, please describe the following, based on your reading, the slides, or the class discussion about this topic:
   a. an idea that you haven’t considered in the same way before;
   b. a concept that is least clear to you.

II. Reflection on reading
   What did you notice about your reading? What was new, or particularly useful to you? Would you suggest changes? Please give specifics.

III. Problems on core outcomes
   From each of the headings under “Problems on topic 4” marked “core” in the heading, solve the problem whose number corresponds to your student classroom ID (See “My grades” for your ID.) If not enough questions are listed, use the last digit of your classroom ID or wrap around to the beginning of the list of questions. Restate problems as the first step of solving them.

IV. Group work and presentation
   Divide the non-core subtopic outcome problems among group members, so that for each subtopic outcome, at least one group member solves a problem.
   Share solutions to problems with other group members, helping each other see how you solved your problems.
   Also, support a group member to prepare a presentation of at least one problem solution. If your group cannot solve a certain problem, describe an effort to solve the problem and request help in this effort. Choose one member of your group to present the solution in class. Rotate in this role from topic to topic.
   For each group member to do: Describe the group process briefly.

V. Glossary (optional, extra credit)
   See heading, “Terminology,” above the Topic 4 problems. Review the terms numbered with the same last digit as your classroom number. See the wiki, “Glossary,” at Blackboard, Course Tools / Wikis. Define an undefined term you find, or review the definition of a term that corresponds to your classroom number and correct or improve the definition if appropriate. Put your name after the definition, and any sources you used.
Exercises for topic 5

I. Response to classroom discussion
   In sentences, please describe the following, based on your reading, the slides, or the class discussion about this topic:
   a. an idea that you haven’t considered in the same way before;
   b. a concept that is least clear to you.

II. Reflection on reading
   What did you notice about your reading? What was new, or particularly useful to you? Would you suggest changes? Please give specifics.

III. Problems on core outcomes
   From each of the headings under “Problems on topic 5” marked “core” in the heading, solve the problem whose number corresponds to your student classroom ID (See “My grades” for your ID.) If not enough questions are listed, use the last digit of your classroom ID or wrap around to the beginning of the list of questions. Restate problems as the first step of solving them.

IV. Group work and presentation
   Divide the non-core subtopic outcome problems among group members, so that for each subtopic outcome, at least one group member solves a problem.

   Share solutions to problems with other group members, helping each other see how you solved your problems.

   Also, support a group member to prepare a presentation of at least one problem solution. If your group cannot solve a certain problem, describe an effort to solve the problem and request help in this effort. Choose one member of your group to present the solution in class. Rotate in this role from topic to topic.

   For each group member to do: Describe the group process briefly.

V. Progress on semester project
   Please turn in the Preliminary draft of the research paper.

VI. Glossary (optional, extra credit)
   See heading, “Terminology,” above the Topic 5 problems. Review the terms numbered with the same last digit as your classroom number. See the wiki, “Glossary,” at Blackboard, Course Tools / Wikis. Define an undefined term you find, or review the definition of a term that corresponds to your classroom number and correct or improve the definition if appropriate. Put your name after the definition, and any sources you used.
Exercises for topic 6

I. Response to classroom discussion
In sentences, please describe the following, based on your reading, the slides, or the class discussion about this topic:
   a. an idea that you haven’t considered in the same way before;
   b. a concept that is least clear to you.

II. Reflection on reading
What did you notice about your reading? What was new, or particularly useful to you? Would you suggest changes? Please give specifics.

III. Problems on core outcomes
From each of the headings under “Problems on topic 6” marked “core” in the heading, solve the problem whose number corresponds to your student classroom ID (See “My grades” for your ID.) If not enough questions are listed, use the last digit of your classroom ID or wrap around to the beginning of the list of questions. Restate problems as the first step of solving them.

IV. Group work and presentation
Divide the non-core subtopic outcome problems among group members, so that for each subtopic outcome, at least one group member solves a problem.
Share solutions to problems with other group members, helping each other see how you solved your problems.
Also, support a group member to prepare a presentation of at least one problem solution. If your group cannot solve a certain problem, describe an effort to solve the problem and request help in this effort. Choose one member of your group to present the solution in class. Rotate in this role from topic to topic.
For each group member to do: Describe the group process briefly.

V. Glossary (optional, extra credit)
See heading, “Terminology,” above the Topic 6 problems. Review the terms numbered with the same last digit as your classroom number. See the wiki, “Glossary,” at Blackboard, Course Tools / Wikis. Define an undefined term you find, or review the definition of a term that corresponds to your classroom number and correct or improve the definition if appropriate. Put your name after the definition, and any sources you used.
Exercises for topic 7

I. Response to classroom discussion
In sentences, please describe the following, based on your reading, the slides, or the class discussion about this topic:

a. an idea that you haven’t considered in the same way before;
b. a concept that is least clear to you.

II. Reflection on reading
What did you notice about your reading? What was new, or particularly useful to you? Would you suggest changes? Please give specifics.

III. Problems on core outcomes
From each of the headings under “Problems on topic 7” marked “core” in the heading, solve the problem whose number corresponds to your student classroom ID (See “My grades” for your ID.) If not enough questions are listed, use the last digit of your classroom ID or wrap around to the beginning of the list of questions. Restate problems as the first step of solving them.

IV. Group work and presentation
Divide the non-core subtopic outcome problems among group members, so that for each subtopic outcome, at least one group member solves a problem.

Share solutions to problems with other group members, helping each other see how you solved your problems.

Also, support a group member to prepare a presentation of at least one problem solution. If your group cannot solve a certain problem, describe an effort to solve the problem and request help in this effort. Choose one member of your group to present the solution in class. Rotate in this role from topic to topic.

For each group member to do: Describe the group process briefly.

V. Glossary (optional, extra credit)
See heading, “Terminology,” above the Topic 7 problems. Review the terms numbered with the same last digit as your classroom number. See the wiki, “Glossary,” at Blackboard, Course Tools / Wikis. Define an undefined term you find, or review the definition of a term that corresponds to your classroom number and correct or improve the definition if appropriate. Put your name after the definition, and any sources you used.
Exercises for topic 8

I. Response to classroom discussion
   In sentences, please describe the following, based on your reading, the slides, or the class discussion about this topic:
   a. an idea that you haven’t considered in the same way before;
   b. a concept that is least clear to you.

II. Reflection on reading
   What did you notice about your reading? What was new, or particularly useful to you? Would you suggest changes? Please give specifics.

III. Problems on core outcomes
   From each of the headings under “Problems on topic 8” marked “core” in the heading, solve the problem whose number corresponds to your student classroom ID (See “My grades” for your ID.) If not enough questions are listed, use the last digit of your classroom ID or wrap around to the beginning of the list of questions. Restate problems as the first step of solving them.

IV. Group work and presentation
   Divide the non-core subtopic outcome problems among group members, so that for each subtopic outcome, at least one group member solves a problem.
   Share solutions to problems with other group members, helping each other see how you solved your problems.
   Also, support a group member to prepare a presentation of at least one problem solution. If your group cannot solve a certain problem, describe an effort to solve the problem and request help in this effort. Choose one member of your group to present the solution in class. Rotate in this role from topic to topic.
   For each group member to do: Describe the group process briefly.

V. Semester project
   Please turn in the Final draft of the research paper.

VI. Glossary (optional, extra credit)
   See heading, “Terminology,” above the Topic 8 problems. Review the terms numbered with the same last digit as your classroom number. See the wiki, “Glossary,” at Blackboard, Course Tools / Wikis. Define an undefined term you find, or review the definition of a term that corresponds to your classroom number and correct or improve the definition if appropriate. Put your name after the definition, and any sources you used.