Fall 2011 - CS 190
Exam 1 Study Guide

Note: this is not meant to be an exhaustive list. This is meant to give you a starting point and some directions to study. You can (and should!) also review your old quizzes, pre-class exercises, homeworks, readings from class etc.

History of robotics:
• What are some famous automatons we discussed? What was the "digesting duck?"
• What was “telautomatics’”
• Where did the term "robot" originate?
• What is the difference between autonomous and teleoperated robots?
• What is "Unimate”? Why is it significant?

Great Robot Race:
• What is the DARPA grand challenge? Why would the government issue a grand challenge instead of simply giving a university money to study a particular problem?
• Explain the different approaches taken by CMU and Stanford in terms of hardware vs. software? What are the pros/cons of each approach.
• List some of the applications/tasks a robotic vehicle such as Stanley or Mindstorm might be able to do in a military context such as Iraq or Afghanistan.

Robots in space:
• List some reasons why robots are ideal for space exploration.
• List some tasks robots could do in the course of space exploration.
• Why is teleoperation of robots in space from earth problematic?
• What are the differences between an orbiter, a lander, and a robot in terms of missions to Mars?
• What were some design challenges faced by NASA in the course of developing Spirit and Opportunity?

Programming:
• What are the different types of languages a computer can understand?
• What is the difference between a compiled and interpreted language? Which type is Python?
• Vocabulary:
  ○ variable
  ○ value
  ○ operator
  ○ expression
  ○ condition
  ○ loops
• Write expressions using variables and values.
• Mathematical operators: + - * / ** %
• What is concatenation? How do you concatenate two strings?
• What are the 4 data-types we've talked about in class? How can we change from one data type to another?
• What are comments? How do you write them? Why do you use them?
• Functions. Why do you use functions when programming? How do you define them? How do you invoke/call them?
• What are parameters? How do you use them in a function? Why would you use them in a function?
• What are loops? How do you define them? When would you use a for loop vs. a while loop?
• How does the range function work?
• How can you get input from users? What are some of the pitfalls of working with user input?