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# CS160 ROBOTICS PROJECT

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The purpose of this project is to operate as a team and to build and program a LEGO robot, according to the specifications below. You must also answer the questions contained in problem #4. Each team member must be present for the next three classes to receive full credit for the assignment. You are allowed to discuss problems or issues with other teams to reach a solution. The instructor is available to help, as a last resort. Have Fun !!....

1. Inventory your robotics kit. Make sure that you have a count of all the parts listed on the parts sheet.
2. Under **Robot Educator** in the LEGO Mindstorms software, complete projects 01 through 08 under **Common Palette**. Once you have built your robot, demonstrate project 08: *Drive in a Square*, to your instructor to receive credit for this portion of the assignment.
3. Attach the ultrasonic sensor to your robot. Using the Mindstorms software, implement the following pseudocode. Use the Mindstorms help and the **Robot Educator** tutorials to learn how to use and program the sensor. Test your programs using your robot and demo your solutions to your instructor.
  - A.. until (300 seconds) do
    - if (ultrasonic sensor is within 25cm of an object) then
      - stop
      - turn 90 degrees right
    - else
      - move forward
    - end if
  - end loop

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B.  until (300 seconds) do
      if (ultrasonic sensor is within 25cm of an object) then
        stop
        generate random number between 1 and 100
        if(random number < 50) then
          turn 90 degrees right
        else
          turn 90 degrees left
        end if
        move forward
      end if
    end loop
```

4. Type the answers to the following questions into a MS Word file and upload into Moodle. You will need to use Chapter 5 and Chapter 6 from your textbook as a reference for the answers.

- a. Explain, in your own words, how the concept of abstraction is implemented within the robotics kit.
- b. Give an example of syntax and semantics used in the robotics programming language.
- c. Explain how an iterative structure is implemented in the robotics programming language.
- d. Explain how a conditional statement is implemented within the robotics project?
- e. How are the three elements necessary for a loop implemented within the programming structure of the robotics programming language?

5. If you have time, do the extra-credit project.

6. Take your robot apart, and inventory the parts again. Are you missing anything? Leave a list of missing parts inside your kit, and notify your instructor.