

# CIS 1.5 Fall 2009 Homework II

## Instructions

- This is the second homework assignment for CIS 1.5.
- The entire assignment will be worth 10 points, that is 10% of your semester grade.
- **It is due by midnight on Friday October 9th** and must be submitted by email (as below).
- **Follow these emailing instructions:**
  1. Create a mail message addressed to *parsons@sci.brooklyn.cuny.edu* with the subject line **CIS 1.5 HW2**.
  2. Write your name, that is the name under which you registered for the course, in the email (when I get an email from *deathmetal@aol.com* or *pinkprincess@yahoo.com*, I can usually guess whose program it is, but that is not as good as *knowing* whose program it is).
  3. Attach **ONLY** the **.cpp** file as I tell you below. (For this homework you will work on a single program, adding lots of things to it.)
  4. Use a **zip** utility to bundle all your files together and send them as **ONE** attachment to the email.
    - on a PC: use **WinZip**
    - on a Mac: use **File - Create Archive...**
    - on Linux: use **zip**
  5. Failure to follow these instructions will result in points being taken away from your grade. The number of points will be in proportion to the extent to which you did not follow instructions... (which can make it a lot harder for me to grade your work — grrrr!)

## Random Roomba

(1 point)

- Start with the program `roomba.cpp` which we worked on in class.
- Save this program with the name `roombaPlus.cpp`
- If you don't have a copy, you can download it from the class website, from the page for Unit II.
- Recall that the robot is working in a room that is 11 by 11 squares.
- Initialise the robot to a random location within the room. In other words use `rand` to generate an `x` and `y` value for the robot that is between 0 and 10 (inclusive).

## Adding dirt

(2 points)

- The Roomba is a vacuum cleaner, so we need to add some dirt to our program.
- Download the file `dirt.txt` from the class website, from the page for Unit II.
- This file has 6 integers in it, they are the coordinates (`x` and `y` values) of three smudges of dirt.
- Create variables to hold these six values.
- Now modify the program so that it loads the six numbers from the file into the variables you have just created.

## Showing dirt

(1 point)

- Make your program print out the location of the three smudges of dirt.

## Finding dirt

(1 point)

- When the robot is at the same location as one of the smudges of dirt make your program print out:  
I found some dirt!!

## Count moves

(1 point)

- Create a new variable moves.
- Use moves to make your program keep a running count of the number of moves that the robot has made.

## Dead battery

(2 points)

- As the robot moves, it uses up its battery and eventually the battery will go flat.
- Make your program check the number of moves the robot has made and if the number is 20 or more, have the program print out the message:  
My battery is flat!  
and then quit.
- The user should still be able to terminate the program by entering q.

## Scoring it

(2 points)

- The aim of the user should be to find all the dirt in the minimum amount of time.
- We'll create a score to see how well the user does.
- Declare a variable score.
- When the robot finds a smudge of dirt, score increases by 10.
- When the robot makes a move, score goes down by 1.
- Print out the value of score when the program exits.

## Extra credit

(1 point)

- Make the program quit automatically if the robot finds all three smudges of dirt.

## Submission

- You will be submitting one files:
  - `roombaPlus.cpp`
- Make sure that you have a **comment** at the top of the file that contains the name of the file, **your name**, "CIS 1.5 HW 1" and the submission date (October 9th).
- As above, use the zip utility to create an archive containing the files.  
Attach that archive to an email message to me.
- The subject line of your email should say: CIS 1.5 HW 2