

CS116 - Intro to Programming, C++

Summer 1998

Homework 2

Due in class Monday 8/10/98

To get started

- In your home directory, create a new directory for this assignment (just like last homework). You may call it `hw2` if you wish.
- Make sure your programs are correct by testing them extensively. If you can't get a program fully to work, make sure you know on what kind of input it works and on what kind of input it fails.
- Use meaningful and descriptive variable and function names and put plenty of comments in your code.
- Create a writeup file called **README**, containing:
 - A *brief* overview of the design of your programs.
 - An explanation of which programs work correctly.
 - An explanation of which programs do not work correctly (if any), what specifically are the problems, and what you think causes the problems.

To turn in an online copy of your assignment, from within the assignment directory do:

```
> submit hw2
```

In addition to the online submission, turn in a hardcopy of all your source files together with your **README** in class. You can print a file on the MacLab A laser printer via the command

```
> enscript -2r -PMacLabA filename
```

Problem 1 [15 pts]

- (a) Write a function `bool even(int num)` which returns `true` on even arguments.
- (b) Use the above function to write another function `void displayCheckerBoard(int numRows, int numCols)` which outputs a checker board-like rectangle of the given dimensions with `x`'s and `o`'s (see below sample run).
- (c) Write a program `checkerboard` which prompts the user for two positive integers, one for the number of rows and the other for the number of columns, and displays a checker board rectangle of the appropriate dimensions.

Here is a sample run:

```
> checkerboard
Please enter the number of rows: 4 <return>
Please enter the number of columns: 5 <return>
xoxox
oxoxo
xoxox
oxoxo
>
```

Hint: The position (row, column) has an `x` if the sum of row and column is even, otherwise it has an `o`.

Problem 2 [15 pts]

Write a program called `lights` which simulates the light switching game discussed in class. It will have 150 light bulbs, numbered from 1 to 150, each one originally turned off, and it will go through 150 rounds of flipping the switches, where round i flips every i -th switch (first round flips every switch, second round flips switches 2, 4, 6, . . . , etc.) At the very end, your program reports which light bulbs are on. (Note that this program takes no inputs.)