

Programming Fundamentals

Programming Assignment 2 – Buildings

Introduction

For this assignment, you are to create a program in Java that asks the user to enter the widths of three “buildings” and then draws them to the screen with a random number of “floors”.

Requirements

The program shall work as follows:

1. Ask the user to enter the widths for three buildings. The width needs to be an **ODD** integer. If the user enters a number that is not odd, ask him/her to reenter the number until it is odd.
2. Generate three random, **EVEN** integers in the range of 2 to 8 (inclusive) for the number of floors for each building.
3. Draw the buildings as follows. The top (“roof”) should be drawn using '_' (underscore character). Each floor will alternate between "windows" levels and "floor" levels. Both will start and end with '|' (vertical line). The "windows" will be drawn by alternating between ' ' (empty character) and '|' (vertical line). The "floor" levels will alternate between '_' (underscore) and '|' (vertical line). The output should look EXACTLY like the sample output (given the same inputs). The number of floors (random numbers from step 2) determine the number of window/floor level combinations.

Program Design Requirements

1. Your code needs to be decomposed into separate (static) methods that do particular tasks. Your main method should use these methods to implement the whole program.
2. You should have the following four methods, in addition to the main method:

`void displayHeading()` - this just displays the heading information (first 4 lines of sample output)

`int getBuildingWidth(int buildingNumber)` - this method prompts the user to enter the odd integer representing the width of building with the specified buildingNumber. It should return that width value. That can then be saved into a variable.

`int getRandomBuildingHeight()` - this method should return a random EVEN integer in the range of 2 to 8 (inclusive).

`void showBuildings(int width1, int height1, int width2, int height2, int width3, int height3)` - this method should draw the three buildings with the specified widths and heights.

Additional Requirements

3. The name of your Java Class that contains the main method should be `Buildings`. All your code should be within the same file.
4. Your code should follow good coding practices, including good use of whitespace (indents and line breaks) and use of both inline and block comments.
5. You need to use meaningful identifier names that conform to standard Java naming conventions.
6. At the top of each file, you need to put in a block comment with the following information: your name, date, course name, semester, and assignment name.
7. The output of your program should **exactly** match the sample program output given at the end.

What to Turn In

You will turn in the single `Buildings.java` file using BlackBoard.

HINT - the buildings need to be drawn from top, down in one pass (all three at once).

Sample Program Output (shows buildings with random heights of 6, 8, and 4 floors)

Programming Fundamentals

NAME: <name>

PROGRAMMING ASSIGNMENT 2

Enter the width of building 1 (an odd number): 9

Enter the width of building 2 (an odd number): 8

Invalid Input! Width needs to be odd.

Reenter the width of building 2 (an odd number): 7

Enter the width of building 3 (an odd number): 15

