Objectives

Practice do-while loop, data type validation, Random class.

Problem

Write a program that simulates an ant trying to crawl up a building of certain height. The ant starts on the ground, at height 0. Each iteration, the ant either crawls up one step, or slips off and falls all the way back to the ground. There is a 50% chance on each iteration that the ant will slip. The program should keep going until the ant gets to the top of the building. It should then print out the number of falls that the ant took before it finally reached the top.

Requirements

- Must provide all the method
- Must follow the requirements
- You can come up with your own solution but make sure that there are at lease 3-4 methods including the main method
- Your output will not match my output since we are using the random class and numbers are being generated randomly.
- Refer to the rubric regarding the comments , indentation, proper naming, and other requirements.

Methods

Public static int getHeighet(Scanner kb): this methods asks the user for the height of the building. As long as the user is not entering a valid height, your program must ask the user again. Must use a while in this method. Refer to the video for the sample code. The height that user enters must be an integer greater than zero.

public static int move (int height, Random rand): This method gets **the height of the building** and a Random object as its parameters. **NO System.out.println in this method**

Declare variables distance and fall before the do-while loop and set them to 0.

This method uses a do-while loop. Do the following inside the loop

- A random number must be generated at each iteration. There is a 50% chance on each iteration that the ant will slip.
- If the generated random number is a one then
    - the ant will move one step up
    - the distance traveled by the ant must be incremented by one.
- If the generated random number is a zero then
    - the ant will fall to the ground and the number of the falls must be incremented
    - and distance traveled by the ant must be reset to zero.

- The do-while loop continues until the distance traveled by the ant is equal to the height of the building. Once the do-while ends, return the number of the falls.

Public static void run (Random rand, Scanner kb): This method uses a while loop so that the program can run many times.

boolean repeat = true;

While(repeat)

{

//call the method getHeight, pass the proper parameters, remember that the method getHeight returns an integer. Make sure to store the return in a variable since you need to pass it to the method move.

// call the method move, pass the proper parameters, this method returns the number of the falls, make sure to store it in a variable since you need to display it it.

// display the number of the falls

// ask the user if they want to run the program again

//if the user says "no" then repeat = false;

}

public static void main (String [] args): this method creates objects of Scanner and Random and then calls the method run.

Sample output, note that your output will not match this output

What is the height of the building: 12'
What is the height of the building: 2'
What is the height of the building: 23$
What is the height of the building: weer
What is the height of the building: 12
To climb up the building of height 12 steps the ant sliped 6251 times
another run: yes
What is the height of the building: 34
To climb up the building of height 34 steps the ant sliped 127979418 times
another run: yes
What is the height of the building: 5
To climb up the building of height 5 steps the ant sliped 70 times
another run: yes
What is the height of the building: sddf
What is the height of the building: 23
To climb up the building of height 23 steps the ant sliped 380495 times
another run: no