

# Advanced Application Development

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## Homework 1 *the Drunken Bug*

Imagine you have a pet bug that you keep inside an old iPhone shell. Every now and then you put your bug in a clear Pez dispenser so he (she? it?) can get some exercise without running away. Under normal circumstances the bug takes 10 steps to run from one end of the Pez dispenser to the other.

Start	step 2	step 3	.	.	.				step 10
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If the bug is sober, allow it to move forward consistently. However, your bug likes to drink. (Shocking, positively shocking.) Walking up and down the Pez dispenser becomes more difficult when impaired by alcohol. After a single drink the bug has a 20% chance of stepping backward when it meant to step forward. After two drinks the likelihood of a misstep is 35%. Three drinks makes it 50%. Four drinks will put the bug to sleep.

### **Part A**

Write an application that computes the number of steps it takes your bug to move from one end of the Pez dispenser to the other given a certain number of drinks entered by the user. Run the simulation 1000 times for that input, then and compute and display the average number of steps.

### **Part B**

Let a player enter an amount (in US Dollars) that they want to bet on the *maximum* number of steps the drunken bug will take to move to from one end to the other. This is not a simulation, so run the traversal only once. Compare the actual number of steps in the traversal to the number bet by the player. If the actual amount is less than or equal to the player's prediction, the player wins, else the player loses. Keep a running total of the player's money as they win and lose.

### **Deliverables**

E-mail me the code *and the executable* for each project. Print out and turn in the source code. Use a cover sheet and staples to complete the package you hand in.