Solution for Homework Assignment 1: CS 202

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Part B: Code Challenge (4 points)

Original Script

In the intial state, the cat points in whatever direction it was pointing to at that point of time. When the flag is clicked, the first instruction makes the cat point in the direction of 90, i.e., pointing horizontally towards right. Then, the subsequent instructions first play the sound 'meow' and then turn the cat by 15 degrees in the clockwise direction. This happens 3 times, each time the sound is played until completion first followed by the turn next.

Here are the answers for the 12 scripts in the same order:

1. It does not result in the same behavior. They differ in the starting direction. Each time this script is run, the cat will continue turning from where it left off during the previous run while the original script always starts from the direction 90 and makes the cat turn by 15 degress from there.

2. It does not result in the same behavior. This time the cat starts from the direction −90 (and proceeds as usual to turn the cat by 15 degrees after playing the sound).

3. It does not result in the same behavior. The instruction that plays the sound does not block (i.e. prevent the flow of control) and so the cat continues turning even before the first sound is played till completion, ending up playing the sound only once.

4. It results in the same behavior. The operator expression is evaluated first and then the turn is made.

5. It does not result in the same behavior. The only difference from the original behavior is that each time the turn is made, it is made by a random amount of degrees instead of a fixed amount of 15 degrees.

6. It results in the same behavior.

7. It results in the same behavior.

8. It results in the same behavior.

9. It does not result in the same behavior. This time the turn happens first and then the sound is played whereas in the original script it is vice versa.

10. It does not result in the same behavior. Since the first letter in the word 'world' is not 'a', the set of instructions within the 'if' block are skipped. As a result there is no output.

11. It does not result in the same behavior. Since the length of 'world' is 5, the control goes inside the 'if' block and executes those instructions and skips the instructions that are surrounded by the 'else' block. As a result the behavior is the same as that of script 9 above - the turn happens first followed by the sound.

12. It does not result in the same behavior. Again the 'if' conditional expression is satisfied and the set of instructions within the 'if' block result in the same behavior as the previous script and the instructions within the 'else' block are skipped altogether.