

Midterm Exam 1: September 30, 2009

The screenshot displays a game engine interface with several key components:

- Scene Tree (Top Left):** A hierarchical list of objects including 'world', 'camera', 'light', 'ground', 'sixShooter', 'barrel', 'hammer', and 'trigger'.
- 3D Viewport (Top Center):** A 3D scene showing a revolver on a green field under a blue sky. Below the viewport are movement controls (arrows) and an 'ADD OBJECTS' button.
- Events Panel (Top Right):** A panel titled 'Events' with a 'create new event' button. It contains a single event: 'When the world starts, do world.my first method'.
- Method Editor (Middle):** The 'sixShooter.mysteryMethod' editor. It features a 'create new parameter' and 'create new variable' button. The code block contains:


```

123 d = 0
While d < c
  Do together
    sixShooter.hammer turn backward 0.1 revolutions duration = 1 second more...
    sixShooter.trigger turn forward 0.05 revolutions duration = 1 second more...
    sixShooter.barrel roll left 0.25 revolutions duration = 1 second more...
    sixShooter.hammer turn forward 0.1 revolutions duration = 0.1 seconds more...
    sixShooter.trigger turn backward .05 revolutions duration = .4 seconds more...
  If sixShooter.b > 0
    decrement sixShooter.b by 1 duration = 0 seconds more...
  Else
    sixShooter say I done run out of bullets! duration = 2 seconds more...
  increment d by 1 duration = 0 seconds more...
            
```
- Method Editor (Bottom):** The 'world.my first method' editor. It features 'create new parameter' and 'create new variable' buttons. The code block contains:


```

world.my first method No parameters
No variables
sixShooter.mysteryMethod c = 2
Loop 6 times times show complicated version
  sixShooter.mysteryMethod c = 2
            
```
- Properties Panels (Left Side):**
 - sixShooter's details:** 'properties' tab. Shows 'b = 5'. Includes 'create new variable', 'capture pose', and various property settings like 'color', 'opacity', 'vehicle', 'skin texture', 'fillingStyle', 'pointOfView', and 'isShowing'. Includes expandable sections for 'Seldom Used Properties', 'Sounds', and 'Texture Maps'. Credits: 'modeled by: Moshe Mahler', 'painted by: Moshe Mahler'.
 - sixShooter's details (bottom):** 'methods' tab. Shows 'mysteryMethod c'. Includes 'create new method' and 'sixShooter move', 'sixShooter turn' buttons.

The first page of the exam contains the code we will analyze for the exam. The following questions refer to that code. The program begins with a call to world.my first method.

1. Variables

- (a) (4 points) What are the parameter variables of sixShooter.mysteryMethod?
(4 points) What would be a better name?
- (b) (4 points) What are the instance variables of sixShooter.mysteryMethod?
(4 points) What would be a better name?
- (c) (4 points) What are the local variables of sixShooter.mysteryMethod?
(4 points) What would be a better name?
- (d) I have saved SixShooter as its own class. Suppose that I create a new world with 3 objects of type SixShooter in it. Next, suppose that I am in the middle of running the mysteryMethod for one of the objects.
 - (4 points) How many variables named “b” are in my world?
 - (4 points) How many named “c”?
 - (4 points) How many named “d”?

2. Structure: For any method that does not have an explicit duration, you may assume that it takes 0 seconds. **Show work for partial credit if your numbers are off, but make your answer clear.** Be careful here: a mistake on one part can really hurt all of your answers.

- (a) (6 points) In the entire program, how many times is sixShooter.mysteryMethod called?
- (b) (6 points) How long does it take sixShooter.mysteryMethod to run the 1st time it is called?
- (c) (6 points) How long does it take sixShooter.mysteryMethod to run the 2nd time it is called?
- (d) (6 points) How long does it take sixShooter.mysteryMethod to run the 3rd time it is called?
- (e) (6 points) How long does it take sixShooter.mysteryMethod to run the 4th time it is called?
- (f) (6 points) How long does it take sixShooter.mysteryMethod to run the last time it is called?
- (g) (6 points) How long does the entire program take to run?

