

Friday, October 16

Name _____ SOLUTIONS _____

Email _____ 6.818-www@mit.edu _____

6.818 Fall 2020

Miniquiz #17

5 Minutes

1. Consider the same MITScript program from the previous miniquiz:

```
x = {a:1; b:2; p:None};  
y = 3;  
x.p = x;  
x.b = y;  
y = x.a;  
x = 4;
```

Now assume that either a mark-and-sweep collector or a copying collector is used to perform garbage collection:

- a) For each object that was allocated in the program (including all the integer constants, the None constant, and the record object), state whether it is still reachable from the root set at the end of the program. If the object is still reachable, also state how it can be reached from the root set. (Assume the root set contains all variables that are in scope.)
 - `Integer(1)`: Reachable (from `y`)
 - `Integer(2)`: Unreachable
 - `Integer(3)`: Unreachable
 - `Integer(4)`: Reachable (from `x`)
 - `None`: Unreachable
 - `{a:1; ...}`: Unreachable
- b) Which objects can be safely deallocated if either a mark-and-sweep collector or a copying collector is invoked at the end of the program?

`Integer(2), Integer(3), None, and the record object {a:1; ...}`