Swinburne University of Technology

COS20007 Object Oriented Programming

The Stack and Heap

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Task 3.2P Answer Sheet

1. In 2.2P, how many Counter objects were created?

There were 2 Object, 1 for the reference object.

2. Variables declared without the "new" keyword are different to the objects created when we call "new". Referring to the main method in task 2.2P, what is the relationship between the variables initialised with and without the "new" keyword?

The variable created with new keyword creates a new object. Which allocates a new memory in the heap. The variables initiated without a new keyword uses a already existing Object in the heap. Whereas for the variable which do not point to any object are stored in the stack .

3. In 2.2P, explain why resetting the counter in myCounters[2] also changed the value of the counter in myCounters[0].

As they are included in the same reference to the object.

4. The key difference between memory on the heap and memory on the stack is that the heap holds "dynamically allocated memory". What does this mean? In your answer, focus on the size and lifetime of the allocations.

Stack use a method call LIFO (Last in first out) the memory in stack is fixed allocation and limited lifetime , whereas heap uses dynamical allocation/ deallocation of memory blocks without a set sequence. The Dynamical allocation is more useful as we don't know how much memory we require for the program beforehand.

5. Are objects allocated on the heap or the stack? What about local variables?

Objects are allocated on heap while references objects on stack
Local variable allocated as stack

6. What does the new() method do when called for a particular class, and what does it return?

Ed When new () method is called for a particular class it will allocates the required memory on the disk and call for the constructure returning the reference to the object.

7. Assuming the class Counter exists in my project, if I wrote the code “Counter myCounter;” (note there is no “=”), what value would myCounter have? Why?

Null, as the variable has only been initialized with the data type “counter” without assigning a value.

8. Based on the code you wrote in task 2.2P, draw a diagram showing the locations of the variables and objects in main and their relationships to one another.