

## Task 3.1P Answer Sheet

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1. How many Counter objects were created?

A total 2 counter objects were created.

2. Variables declared in main() are different to the objects created when we call new. What is the relationship between the declared variables in main and the objects created?

Variables are stored by value in the stack whereas objects are stored in the stack by reference. The objects are stored in the Heap and the address of the object is placed in the stack.

3. Resetting the counter in myCounters[2] also changes the value of the counter in myCounters[0]. Why does this happen?

myCounter[2] and myCounter[0] are the reference to the same object.

4. The key difference between memory on the heap compared to the stack and the heap is that the heap holds dynamically allocated memory. What does this mean ?

Variables allocated to the stack are dealt with when the program is compiled and Heap memory allocation is done in runtime. The size of the stack is fixed when the thread is created but the heap can grow as needed by asking the OS for more memory.

5. On which are objects allocated (heap or stack) ? On which are local variables allocated (heap or stack) ?

Objects are allocated on the heap and local variables are allocated to the stack.

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

When new is called on a class it creates a new instance of the object and allocates a memory for it on the heap and then stores the address of that heap space on the stack then it returns an object.

7. Draw a diagram showing the locations of the variables and objects in main.

