

## Task 3.1P Answer Sheet

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1. How many Counter objects were created?

= 2 counter objects were created mycounters[0] , mycounters[1]. Mycounters[2] was replicated from mycounters[0]

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?

= In programming, references are not held by variables. However, their corresponding class is referred to by objects.

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

= The references to the same class are stored in mycounter[2] and mycounter[0]. This means that any modifications made to an object are also applied to the referred class. Hence, if another object shares the same allocated memory of the changed class, any modifications made to it will also be reflected in that 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 ?

= Memory allocation techniques involve two memory segments known as stack and heap. The primary distinction between these two segments is the way the memory is allocated. Stack memory involves a linear and sequential allocation process used for static memory allocation, while heap memory acts as a pool of storage area, randomly allocating memory for dynamic memory allocation. Though both segments have different working, the major factor that distinguishes them is speed. In terms of speed, stack allocation is significantly faster than heap allocation.

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

= Objects are allocated on the heap  
Local variables are allocated on the stack

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

= Upon calling the `new` function on a class, the required memory gets allocated on the disk, the constructor is called and a memory address is returned as a reference to the object.

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

