

Task 4.1P Answer Sheet

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1. How many Counter objects were created?

Since a clear context is not given, I am assuming the Counter is the Counter class in 2.1
A total of <3>.

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 main, due to the nature of main being a place to references to store values for other objects or data structures. The variables created will be on a stack and destroyed immediately when the value is returned. Variable holds a **value**

On the other hand, "new" is usually to create a object from a class and is located on the heap instead of a stack. The objects hold the **data and methods** defined by the class being initialized.

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

Because the counter objects in 2.1 , it has this relationship:

```
counter[2] = counter[0];
```

And the counter objects share the same blueprint as the Counter class, especially this function:

```
public void Reset()  
{  
    _count = 0;  
}
```

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 ?

The heaps memory it is allocated at runtime which is more flexible, while memory on the stack is located base on the program structure and size which is limited by the stack size.

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

Objects are located on a heap because you want to be flexible when working with them because they are not limited by the stack size so object could be larger. Meanwhile, local variable is better suited for a stack base memory storage because of management when a function is called and destroyed after returning a value. This is an automated process while you have to do it manually with the heap.

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

“new” is to create an instance of a particular class based on its blueprint. The reference of that object is returned for later use, for instance to use the methods defined within that class. (does not apply to a static class since methods are called directly on a static class)

6. Draw a diagram showing the locations of the variables and objects in main and their relationships to one another.

