Task 3.2P Answer Sheet

Name: Charlie Peters
Student ID: 103982457

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

    Two Counter objects were created.

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?

    In C# variables are required to be initialized before being used, therefore the ‘new’ keyword was deemed appropriate when creating new class instances. The ‘new’ keyword is now used to help assign where in the ‘long term memory’ the instance must be kept. Variables without the ‘new’ keyword are stored in the heap and class instances with the ‘new’ variable are stored in stack.

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

    Since myCounters[2] was assigned to the value of myCounters[0], myCounters[2] does not have a value in the memory allocated to hold its _count variable, instead it contains a pointer for the value of myCounters[0]. Therefore, when resetting either of these two counters, both will be reset.

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.

    Statically allocated memory only allows memory allocations before the program begins, dynamically allocated memory allows memory allocations at any point during the program.

    This allows programs to be built under the assumption that the required amount of memory for the program to run is unknown, in static memory too little or too much memory allocated is a possibility.

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

   At runtime objects exist on the heap.

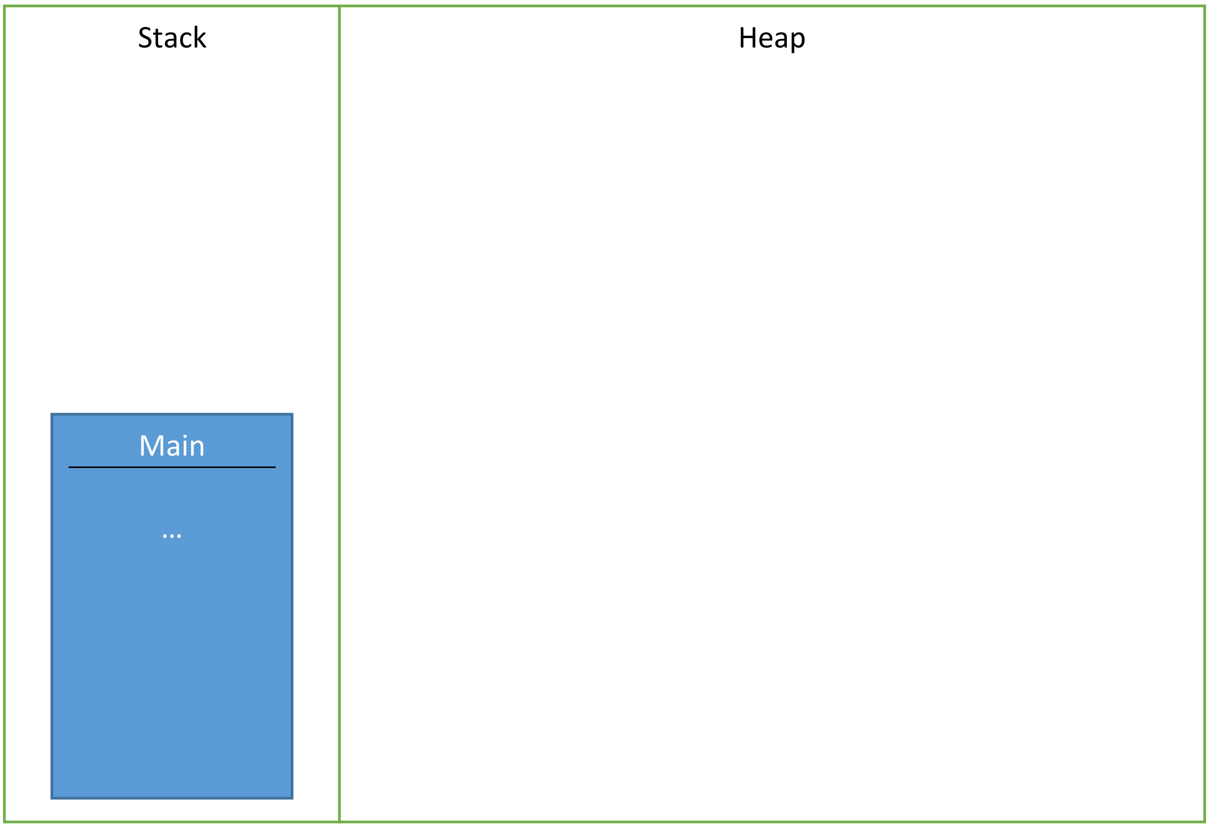
6. What does the new() method do when called for a particular class, and what does it return?

   A no method error would appear since the new() method has not been specifically defined.

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

   myCounter would not contain any value, calling the line “Counter myCounter;” only allocates the memory required for the object to be initialized and therefore only then a value is added.

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.


Stack
Heap
Main
…