2MD3 Assignment 1

Name: Abdulrahman Derbala

MacID: derbalaa

Student number: 400301521

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Question 1

i) C structs is used to develop a program using functions while C++ classes uses objects instead. Unlike C structs, C++ classes have access specifiers like public and private, this always the class to be more protected.

ii) During function calls, a copy constructor is important to control returning and passing of user defined types by value. If a copy constructor is not created by the user, the compiler will create its own copy constructor and might not function as intended. This can lead the constructor to act as a shallow constructor. In addition, copy constructors helps the user create a new object from a pre-existing object.

Question 2

Error/Poor design 1:

```
void Counter(int c = 10) : count(c) { }
```

The above line is a constructer, and constructers do not need a return type as they are not called from the code, instead they are called from the object initialization code.

Removing the void at the beginning of the line should fix that error.

```
Counter(int c = 10) : count(c) { }
```

Error/Poor design 2:

```
~Counter(int c){ }
```

The above line is a destructor, a destructor's purpose is to delete an object. Therefore, it doesn't require a parameter.

Removing the parameter will fix the error.

```
~Counter(){ }
```

Error/Poor design 3:

```
int getCount() {
    cout << "Counter is " << count << endl;
}
```

The following function's return value is an integer, but it does not return an integer, instead it prints it out.

There are 2 solutions to fix this, either change the return type to **void** or remove the line that prints the count and replace it with **return count**. But the second option is better as the function name is getCount not printCount.

```
int getCount() {
    return count;
}
```

Error/Poor design 4:

```
int getIncrementedCount() const{
    return ++count;
}
```

This function is not the correct place to use **const**, as it makes it read-only and we want to increment the count. A good use for **const** would be in the **getCount** function instead since we only want to return count.

To fix this error, simply remove **const** before the {.

```
int getIncrementedCount() {
    return ++count;
}
```