

- 1- What is a helper function? Explain the pros and cons.
- 2- There are three access modifiers in class to limit or grant access to attributes and methods, name them and explain what they do.
- 3- Having the following Dynamic array of doubles class, write the code for the Constructor and copy constructor and destructor.

```
class DoubleArray {
    double* m_array;
    int m_size;
public:
    DoubleArray(int size) {

    }
    DoubleArray(const DoubleArray& D) {

    }
    ~DoubleArray() {

    }
};
```

- 4- Explain what a reference is and support it with an example.
- 5- Convert the following function to a template so it can be used for any type of object. Make sure your conversion is done in a way that least amount of requirement is needed for an object to work with this template.  
This function check to make sure the “value” is in acceptable range between maxVal and MinVal inclusive:

```
bool isInRange(int maxVal, int minVal, int value) {
    bool ret = false;
    if (maxVal >= value && minVal <= value) {
        ret = true;
    }
    return ret;
}
```

- 6- Modify the following cout statements to support the format specified:

```
char name[41] = "Fred";
double rate = 12.34;
cout << "*" << name << "*" << endl;
cout << "*" << rate << "*" << endl;
```

```
*                                Fred*, right justified, 40 spaces
*000012.340*, right justified, 3 digits after decimal, 10 spaces padded with 0
```

- 7- If Class Base has a virtual function called act(), and the Class Derived which inherits the Base class has a function called act().
  - 1- Is act() of Derived virtual too?
  - 2- If Derived has another function and calls act() which act will be called, Base's or Derived's? How can you call act() in this function to make sure the Base's act() is called.

- 8- How can you make sure that the destructor of Derived is always called when a dynamic Derived is pointed by base's pointer?