CSE 2341 – Fall 2016

Homework Assignment 1

Due: September 28, 2016 at 11:00 pm
Upload to Blackboard

Submission Checklist:

- ❏ Am I submitting a PDF?
- ❏ Does the name of the file I'm submitting start with my last name?
- ❏ Does the name of the file I'm submitting have **-hw01** after my last name?
- ❏ Is my name inside the document header?
- ❏ Are all the diagrams contained in my submission computer created (and not hand-drawn)?
- ❏ Is any code that I've included as part of my submission typeset in a fixed-point font such as courier?

1. Determine the output of each of the following expressions. If a single letter is printed, be specific about which letter in a word the expression prints. For instance, if the word is "color" and the expression refers to an 'o', indicate which 'o' of "color" it is. [2 points each]

```
char data[6][10] = {"camera", "lens", "printer", "tripod", "lights", "clock"}
```

a. `cout << data[3];`

b. `cout << *(data + 2) + 3;`

c. `cout << *data + 1;`

d. `cout << *(*(data + 4) + 2);`

e. `cout << **data;`

2. Draw a memory diagram for the following block of code. [10 points]

```
void myFunction(int * myPtr)
{
   int* x = myPtr + 1;
   x[2] = 10;
   myPtr = new int[5];
   for (int i = 0; i < 5; ++i)
         myPtr[i] = x[0] + i + 3;
   //Draw state of memory here.

}

int main ()
{

   int* data = new int[6];
   data[0] = -2;
   for (int i = 1; i < 6; i++)
         data[i] = *(data + i - 1) + 2;

   *data = 10;
   int* temp = data;

   myFunction(data);

   return 0;
}
```

(Copy and paste your memory diagram here)

3. If an object is managing dynamically allocated memory, what three member functions should you always implement? [3]

4. Assume that a job/internship interview. Below is a sequence of questions that the interviewer asks you. Provide your response to each. [7]

Interviewer: "Let's talk about binary search and Big-O. First, tell me why binary search doesn't work on an unsorted array."
You:

Interviewer: "OK. A standard Binary Search algorithm is said to be O(lg n). Linear search is said to be O(n). Can you briefly tell me what it means for an algorithm to be in O(g(n))? In other words, if I tell you Algorithm ABC is O(g(n)), what does that mean?"
You:

Interviewer: "Groovy. Now, convince me that Binary Search is actually in O(lg n) when starting with a sorted data set."
You:

5. Assume you're adding functionality to a basic singly-linked list. Write a method that will print the contents of the linked list out in reverse order. [10]

```
template<class T>
class SLList
{
private:
    //assume a ListNode has a T& getData() method
    //
    ListNode* front;
    int numNodes;
public:
    //Other important methods such as constructors, etc.

    //Add your method here to print the list in reverse order.
    //You may assume that every type has the << operator
    //overloaded.


};
```