**CS 2341 – Fall 2020**

**Homework Assignment 1**

Due: Sep 2, 2020 @ 11pm

Uploaded to Canvas

*Submission Directions:*

* **Put your name inside the document in the header of the Word doc (or some equally**

**conspicuous place)**

* Complete the questions below. Point values are indicated in square brackets.
* For questions that require diagrams, create the diagrams on your computer (no hand-

drawn/scanned diagrams). You can do this with PowerPoint, Google Draw, LibreOffice Draw, etc. Then copy-and-paste the diagrams into the correct place in the document you submit.

* For any code or pseudocode, please use a fixed-point mono font (courier for example) and consider

appropriate spacing and indentation.

* Please **submit a PDF** file of your solutions.

1. There are some issues in the following program, but none are compile time errors. What’s wrong? [5]

#include <cstring>

#include <iostream>

using namespace std;

class HW1

{

public:

 char \*word;

 HW1() { }

 ~HW1() {

 delete [] word;

 }

};

void foo(HW1 a)

{

//some operation here

}

int main()

{

 HW1 a;

 a.word = new char[80];

 strcpy(a.word, "abc");

 foo(a);

 return 0;

}

2. What is the output of the program below? Give any output, any errors, and an explanation or a memory diagram of what occurred. [5]

void foo(int a)

{

 cout << a << endl;

}

int main()

{

 int \*b = new int;

 foo(\*b);

 \*b = 5;

 foo(\*b);

 b--;

 foo(\*b);

 b++;

 (\*b)--;

 foo(\*b);

 ~~foo(reinterpret\_cast<int>(b));~~ (update 08/28- remove this line)

 return 0;

}

3. What is the output of the code shown ~~above~~ below? Give the output, any errors, and an explanation or a

memory diagram of what occurred. Bonus: show an explain the memory leak that occurs in the code

above. [5]

void foo(int \*&a)

{

 int \*b = a;

 int c = 5;

 a = &c;

 \*b = 6;

}

int main()

{

 int \*a = new int;

 foo(a);

 cout << \*a << endl;

 return 0;

}