CSCI 3232 Systems Software Assignment 4

Upload all your files to the dropbox in Folio before the deadline --- **11:30PM Feb 8, Wednesday, 2017.**

**Note:** Make all your codes compilable and runnable under Ubuntu. Do not put your codes in Word or PDF documents. Make them separate files as you would compile them. **Include a Makefile to compile all your programs.**

1. (20 points) Below is a C++ program. What is the output of this program? You should be able to tell the output without running the program.

#include <iostream>

using namespace std;

class programming

{

protected: int variable;

public:

programming()

{

cout << "In constructor\n"; input\_value();

}

~programming()

{

cout << "In destructor\n"; output\_value();

}

void input\_value()

{

cout << "In function input\_value\n"; variable = 100;

}

void output\_value()

{

cout << "Variable is "<< variable << "\n";

}

void onemorefunction() { if(variable%2) cout<< "Variable is odd\n";

else cout<< "Variable is even\n";}

};

int main(int argc, char \*argv[])

{

programming object;

object.onemorefunction();

return 0;

}

1. (35 points) Write a C++ program A3p2.cpp with a class of your own design. The class should contain a protected **int** variable *var*, which is initialized with an integer value between 1 and 50 in a constructor. The class should contain a public member function called *play* that should print out a sequence of integers as a result of iteratively applying a function *f* to the integer *var*. The function *f* is defined as f(x)=3x+1 if x is odd and f(x)=x/2 if x is even. Stop the iteration when the value 1 is reached. (Example: When *var* is 6, the *play* function’s output sequence should be 6,3,10,5,16,8,4,2,1.) In your main function create an object of this class whose member *var* should be initialized with a value on the command line argument (that is, argv[1]) and then call the *play* member function to output the sequence of desired integers.
2. (35 points) Write a C++ program A3p3.cpp with a class that is a derived class of the class in problem 2. Add a private **int** member *var2* to this class. Initialize the member variables *var* and *var2* with a value between 1 and 50 using a constructor. Add a public member function called *getgcd* that should print out the greatest common divisor of *var* and *var2*. (You can refer to gcd.c in Folio’s sample codes directory for how to compute the greatest common divisor of two integers.) In your main function, create an object of this class, initialize the members *var* and *var2* with values on the command line arguments (that is, argv[1] and argv[2]) and then call the *play* and *getgcd* functions.
3. (10 points) What is the output of the following C++ program? You should be able to tell the output without running the program.

#include <iostream>

using namespace std;

int main(int argc, char \*argv[])

{

int arr[2][3]={{5,16,27},{38,49,50}};

cout<<arr[0][1]+\*(\*(arr+1)+2);

return 0;

}

1. Note: You need to supply a makefile to compile your programs in problems 2 and 3. Without a correct makefile, 5 points will be deducted.