Problem 1. Short answers.

(a) [10 points]

Please fix errors in the following code so it compiles and computes the sum of two variables a and b. When you run the program, the correct code should display a+b equals 6.2 on the screen.

```
#include using
namespace std;

double mySum(double a, double b){

     return a+b;
}
int main(){

 double a = 3.5;
 double b = 2.7;
 cout << "a+b equals ";
 cout << mySum(a, b)<< endl;


 return 0;
}
```

(b) [5 points] **what will the following code output?**

```
#include <iostream>
using namespace std;

void printNumber(int num) {
cout << "Integer: " << num << endl;
}

void printNumber(double num) {
cout << "Double: " << num << endl;
}

void printNumber(int num1, int num2) {
```

```
cout << num1 <<" and " << num2 << endl;
}

int main() {

double a = 4.1;
int b = 3;

printNumber(a);
printNumber(b);
printNumber(a, b);

return 0;

}
```

Output:
Double: 4.1
Integer: 3
4 and 3

(c) **[5 points] what will the following code output?**

```
#include <iostream>
using namespace std;

void doubleNumber(int num){

num = num*2;

}
int main(){

int num = 35;
doubleNumber(num);
cout << num << endl;

return 0;
```

```
}
```
Output:
35

(d) [5 points] **If this code is compiled with g++ on the mac, the output is:**

```
product=6
product=-2139095038
```

Please explain what went wrong. Compile this code on your own machine and report the output.

```
#include <iostream>
using namespace std;

void somefunc1(float a)
{
     float b=3;
     cout << "product=" << a*b << endl;
}
void somefunc2(int c)
{
     int d;
     d++;
     cout << "product=" << c*d << endl;
}
int main() {
     somefunc1(2);
     somefunc2(2);
}
```

The variable d was declared but never given a value to use in the code.

Problem 2. (25 points) Write a C++ program to Generate the following multiplication table **using nested for loops** and save it a text file "MultiplicationTable.txt".
No write-up is required for this problem. Please submit your .cpp file as "yourLastName_hw6_prob2.cpp".

```
1
2   4
3   6   9
4   8  12  16
5  10  15  20  25
6  12  18  24  30  36
7  14  21  28  35  42  49
8  16  24  32  40  48  56  64
9  18  27  36  45  54  63  72  81
```

Problem 3. (25 points) Write a C++ function:

```
int countRabbit(int nRabbits, int nYears)
```

The function takes two input argument: the first one is the initial population of rabbits and the second one is the total time span in years. Given the initial population of rabbits, each year, 5% of the population of the previous year dies off, and each year exactly 5 new rabbits are born. (Note: it should be impossible for "partial rabbits" to exist. For example, the population should never be 13.7— we're not interested in 70% of a rabbit. You should always round the population down to a whole number). The program should return to total rabbit population after n years. Write a C++ program to call the function in order to compute the rabbit population after 50 years given the initial population of rabbits is 15 at year 0.

Report your result in the write-up. Please submit your .cpp file as "yourLastName_hw6_prob3.cpp".

Output:

There are 93 rabbits after 50 years.

Problem 4. (25 points) Write a C++ function

```
int reverseInteger(int n)
```

that takes a signed integer n and returns the integer with reverse digits. For example, (1) input: 123 the output should be 321, (2) input: -123 the output should be -321 (3) input: 120 the output should be 21.

Report your results for testing the above three cases in the write-up. Please submit your .cpp file as "yourLastName_hw6_prob4.cpp".

Output:

student@student-VirtualBox:~/Desktop/Lab-6$ ./run-4
please enter an integer you want to reverse: 123
321
student@student-VirtualBox:~/Desktop/Lab-6$ ./run-4
please enter an integer you want to reverse: -321
-123
student@student-VirtualBox:~/Desktop/Lab-6$ ./run-4
please enter an integer you want to reverse: 120
21

Submission Instructions:

There should be 4 files in your submission:

1. A write up (any type- .txt, .docx, .pdf are all fine) that contains your answers to all questions in problem 1, 3 and 4.
2. The .cpp file for problem 2.
3. The .cpp file for problem 3.
4. The .cpp file for problem 4

Please make sure your last name is included in the filename.