CSCI 13500 Midterm S22 v1 EMPLID

NAME: FIRST LAST

SEAT ROW NUMBER

1. (30 points) Answer the following questions.
   (1) Declare an array of ints called values with size 5. Initialize the elements, from the first one to the last one, to be 1, 6, 5, 9, 8.

   (2) Declare function foo whose input parameter is a string (pass by value) and return is an int. You just need to write the function header, no implementation is needed.

   (3) Write code to generate a random floating point number in [-2, 1].

   (4) Given array of strings as follows
   string greetings[] = {"Hi", "Hello", "Great!"};
   What is the value for greetings[2][5]?

   (5) How to run the default compiled runnable file generated by g++ on a correct cpp file?

(6) What is the output of the following code?

```
int value = 1;
for (int i = 2; i <= 6; i += 3)
{
    value += i;
    cout << value << endl;
}
```

(7) Write code to calculate the square root of a, where a is a positive double number. Hints: you may use sqrt function.

(8) If m is 3 and n is 1, what is the value of 1 / 2.0 * m * n?

(9) Suppose n is an int >= 10, write code to extract its last two digits. For example, suppose n is 21, after your code, you get 21; if n is 1265, then your code gets 65.

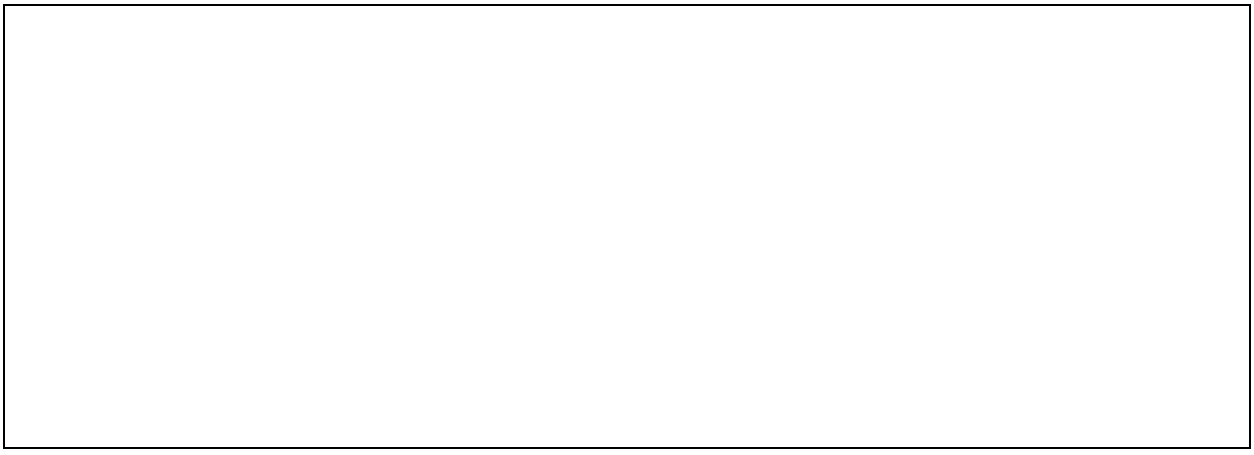
(10) What is the output of the following code?

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

void foo(int size);

int main()
{
   foo(4);
   return 0;
}

void foo(int size)
{
  for (int numAsts = size; numAsts >= 1; numAsts--)
  {
     for (int i = 0; i < size - numAsts; i++)
        cout << "#";
     for (int i = 0; i < numAsts; i++)
        cout << "*";
     cout << endl;
  }
}
```



2. (45 points) Short programming exercises
   (2.1) Write code in main that generate 20 random integers in [10, 100], tally how many of grades are >= 70, and how many grades are between 60 (included) and 70 (not included), and how many grades are < 60.

(2.2) Define a function, sort two given strings according to their lengths, return type is void. For example, suppose string a is “seller” (six letters) and string b is “buyer” (five letters), after calling this function, a is changed to “buyer” and b is changed to “seller”. Suppose a is “good” and b is “better”, then after the function, a and b do not change.

(2.3) Write code.

Create an ifstream object fin that reads text file named data.txt.

Write code to ignore the first line of data.txt.

Hints: you might want to use ignore method of file stream.

```
istream& ignore (streamsize n = 1, int delim = EOF);
```

Extract and discard characters

Extracts characters from the input sequence and discards them, until either *n* characters have been extracted, or one compares equal to *delim*.

Suppose data.txt has only a column of decimal numbers. Write code to find out and print the minimum value.

Call close method of fin.

3. (10 points) **Define a function**, for a given string str, return true if all its characters are only letters ‘a’, ‘b’, or ‘c’, otherwise, return false.

4. (15 points) Define a function, for a given int, return how many digits are 2. For example, if the given integer is 20, then the number of 2's is 1, if the given integer is 101, then the number of 2's is 0.