CSCI 002 **Exam #2**
Spring 2020 Data Structures using C++ Name Harry Patel

Part II: (*Write your answer in the provided box…20 points*)

1. **By hand:** a. Write code that instantiates an integer list and then populate it with 3 random integers. b. Sort the list. c. Write a for loop that prints the contents using an iterator.

```
① list <int> myList;
  list <int>:: iterator itr;

  myList.Pushback (rand()%11);
  myList.Pushback (rand()%11);
  myList.Pushback (rand()%11);

② myList.sort();

③ for(itr = myList.begin(); itr != myList.end();
       itr++){
     cout << (*itr) << endl;
  }
```

2. Given the following structure and map definition.

```
struct Person {
        string name;
        int age;

        Person(string arg1, int arg2) {
                name = arg1;
                age = arg2;
        }
};

map<int, Person*> personMap;
```

Unique Id	name	age
123	Joe	22
524	Mary	25
375	Jane	21

a. Write three lines of hard code that populates personMap with the data given in the above table.

```
personMap[123] = new Person("Joe", 22);
personMap[524] = new Person("Mary", 25);
personMap[375] = new Person("Jane", 21);
```

b. Write three lines of code that prints first name and age of each element.

```
cout << personMap[123]->name << personMap[123]->age << endl;
cout << personMap[524]->name << personMap[524]->age << endl;

cout << personMap[375]->name << personMap[524]->age << endl;
```

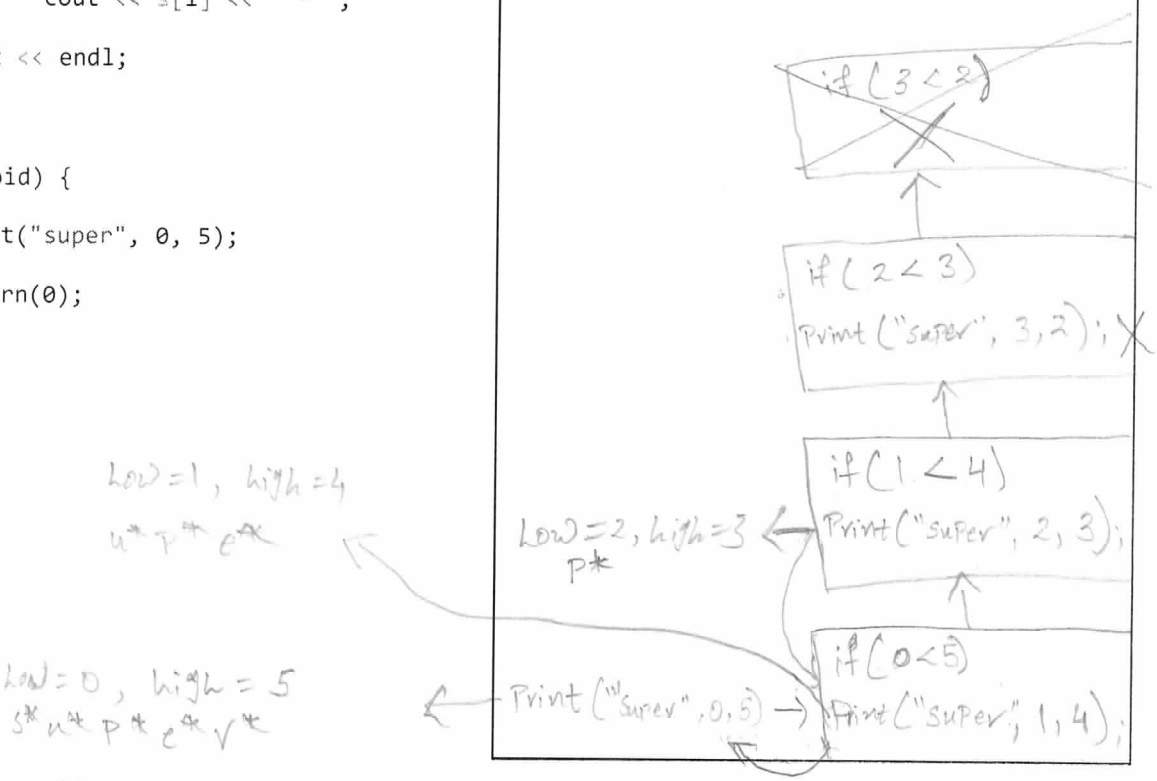
3. Show a ***clear*** trace AND the output of the following:

```
void print(string s, int low, int high) {

        if (low < high) {
                print(s, low + 1, high - 1);
        }

        for (int i = low; i < high; i++) {
                cout << s[i] << " * ";
        }
        cout << endl;

}

int main(void) {

        print("super", 0, 5);

        return(0);
}
```

Output:

p*
u* p* e*
s* u* p* e* r*

Trace:



4. Beginning with an empty binary search tree, illustrate the tree that is formed by inserting the following numbers in order.

8.6 12.4 2.8 6.5 1.1 5.2 7.4 9.6