Lab 8

Due Date: Oct 23, 2019
Total Points: 15 points

The purpose of this lab is to practice writing basic searching and sorting algorithms and recursive functions.

Program 1:

Write a program that sorts a vector of names alphabetically using the selection sort and then searches the vector for a specific name using binary search. To do that, you need to write three functions:

1. void selSort (vector <string> & v): sorts the vector using selection sort
2. void display (const vector <string> & v): displays the vector contents
3. int binSearch (const vector <string> & v, string key): searches the vector for a key, returns the index of the key if found and -1 if the index is not found

Your main program should instantiate a vector of strings, names, and initialize it to the names specified below. Then call the functions in the order specified by the comments.

```
int main()
{
	// Vector of string initialized to specific names
	vector<string> names {"Joe Garcia", "Amelia Perez", "Bob
	Haynes", "Tim Ducrest", "Kevin Garcia", "Suzy Walter", "Fang
	Yi", "Robert James", "Mary Andres"};

	//Call the function display to print the vector contents

	//Call the selSort function to sort the vector in ascending order

	// Call the function display to print the sorted vector contents

	// Call the binSearch function to search for "Kevin Garcia "

	// Call the binSearch function to search for "Joe James"

	return 0;
}
```

Program 2:

Write a recursive function *multiply* that takes two integers *x* and *y*. The function should return the value of *x* times *y*.

You may test your function by entering two integers:

- 4 and 7

- 1 and 5
- 0 and 2
- 8 and 0

Program 3:

Write a recursive function *numChars* that counts the number of times a specific character appears in a string. For example:

- the character ‘l’ appears 4 times in string “Hello Bello”
- the character ‘a’ appears 0 times in string “Hello Bello”
- the character ‘I’ appears once in string “I”…

You may test your function by counting the number of ‘l’, ‘a’, ‘h’ occurrences in the string “Hello Bello” .

Extra Practice:

Write a recursive function *sumAll* that accepts an integer argument and returns the sum of all the integers from 1 up to the number passed as an argument. For example, if 50 is passed as an argument, the function will turn the sum of 1, 2, 3, 4, ..50.