Object-Oriented Programming (3190)

Homework 9

Spring 2023

1. [5 points] Use a text editor to create a file of integers separated by one space character as shown below. Then complete the application program to find if a given integer is in the file.

14 17 24 32 11 72 43 88 99

Application File:

```
// Implement SearchFromFile function

int main()
{
	vector<int> nums = {17, 72, 73};

	for (auto i = 0; i < nums.size(); i++)
	{
		int value = nums[i];
		cout << "Search the integer to look for: " << value << endl;
		// Printing the result
		if (SearchFromFile("File1.txt", value))
		{
			cout << value << " is in the file. " << endl;
		}
		else
		{
			cout << value << " is not in the file!" << endl;
		}
	}

	printf("\n Press Any Key to Terminate ...\n");
	getchar();
	return 0;
}
```

Possible Output:

```
Search the integer to look for: 17
17 is in the file.
Search the integer to look for: 72
72 is in the file.
Search the integer to look for: 73
73 is not in the file!

 Press Any Key to Terminate ...
```

Your solution should fulfill the following requirements:

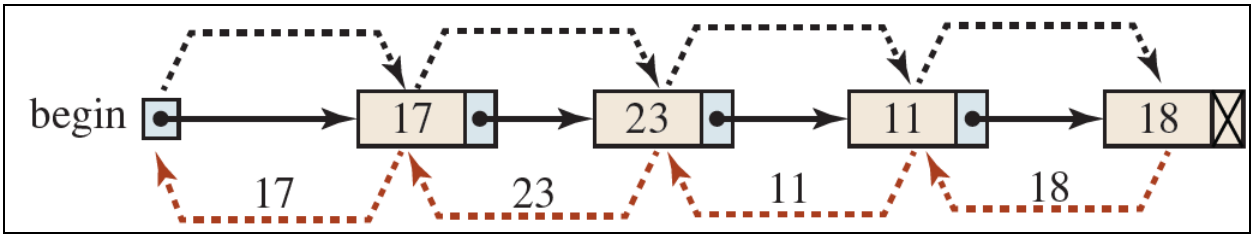
(a) Implement ***SearchFromFile*** function using ***fstream*** to read the file.

(b) You may use ***fstream***'s ***open***, ***fail***, ***eof***, ***get***, ***close*** member functions.

(c) Ensure that your program's output matches the provided sample output, considering the application file.

(d) Submit your complete program in a single file.

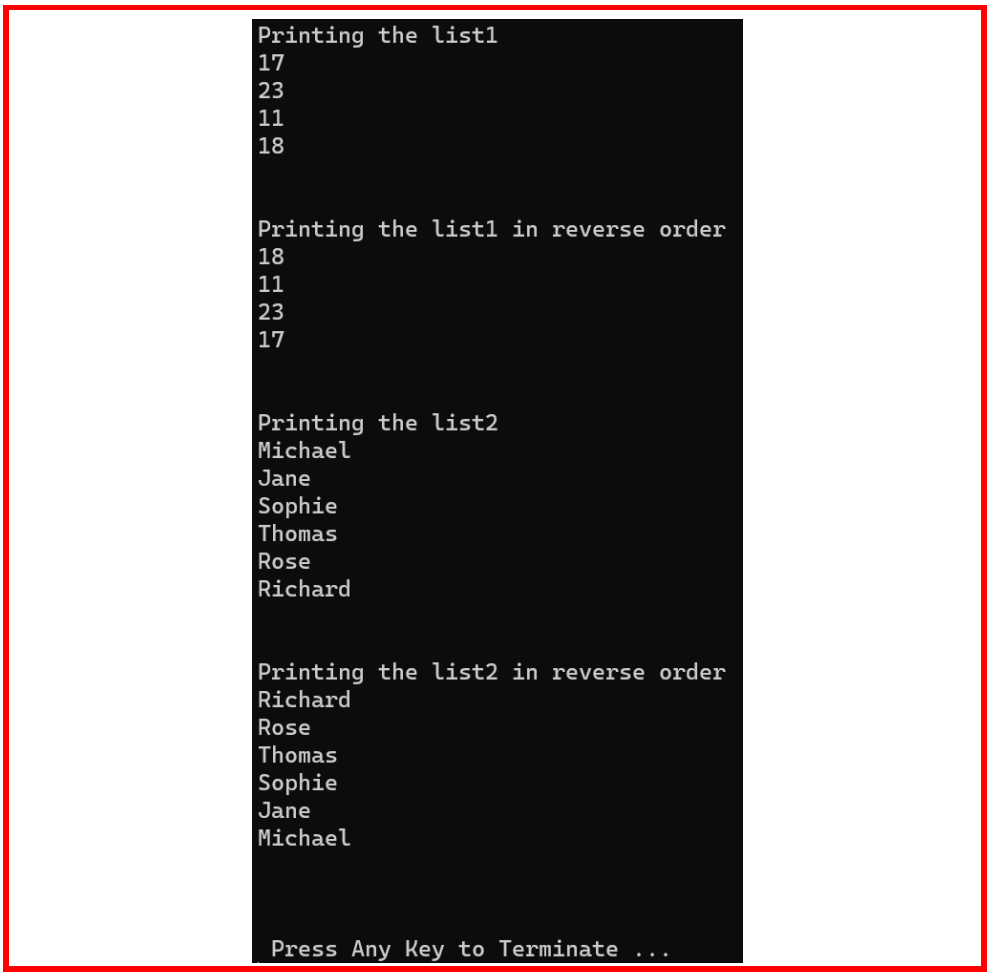
2. [5 points] Please refer to the ***List*** class in the lecture slides. Add void ***print*** function and void ***reversePrint*** function to the ***List*** class so that we can print the contents of the linked list in order and reverse order respectively. The functions start from the first node and move to the end of the list using the ***next*** pointer and print the data value of each node as shown below.



Application File:

```
// Extend the List class
// Implement print member function
// Implement reversePrint member function

int main()
{
	// Instantiation of a List object
	List <int> list1;
	// Insert six nodes in the list
	list1.insert(0, 17);
	list1.insert(1, 23);
	list1.insert(2, 11);
	list1.insert(3, 18);

	// Printing the value of list in forward direction
	cout << "Printing the list1" << endl;
	list1.print();
	cout << endl << endl;
	// Printing the value of list in reverse direction
	cout << "Printing the list1 in reverse order" << endl;
	list1.reversePrint();
	cout << endl << endl;

	// Instantiation of a List object
	List <string> list2;
	// Insert six nodes in the list
	list2.insert(0, "Michael");
	list2.insert(1, "Jane");
	list2.insert(2, "Sophie");
	list2.insert(3, "Thomas");
	list2.insert(4, "Rose");
	list2.insert(5, "Richard");
	// Printing the value of list in forward direction
	cout << "Printing the list2" << endl;
	list2.print();
	cout << endl << endl;
	// Printing the value of list in reverse direction
	cout << "Printing the list2 in reverse order" << endl;
	list2.reversePrint();
	cout << endl << endl;

	printf("\n Press Any Key to Terminate ...\n");
	getchar();
	return 0;
}
```

Possible Output:



Your solution should fulfill the following requirements:

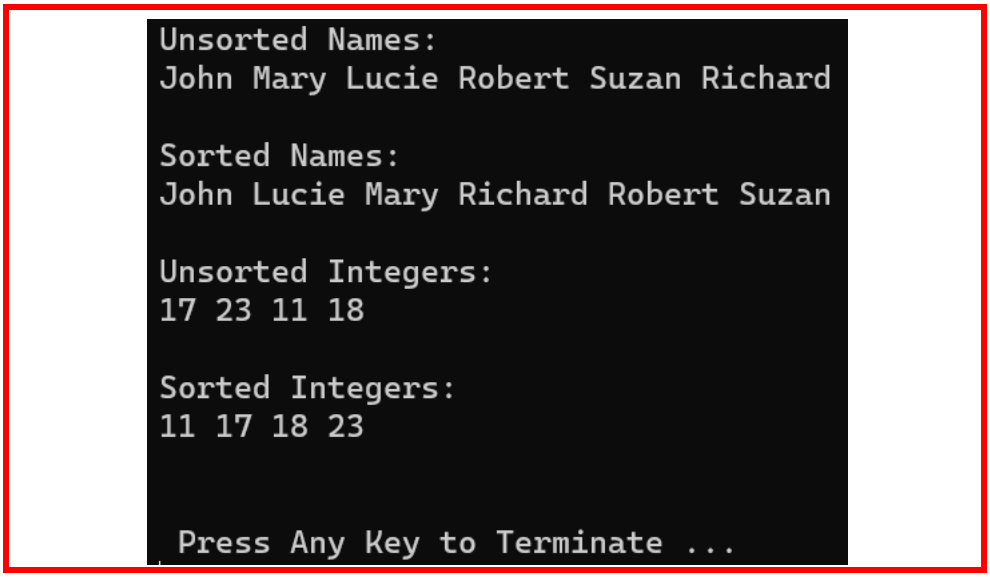
(a) Implement ***void print*** and ***void reversePrint*** member functions to the List class.

(b) Ensure that your program's output matches the provided sample output, considering the application file.

(c) Submit your complete program in a single file.

3. [5 points] Write a program that creates a vector of a few values. Then print the values, sort the values, and print the sorted values.

Possible Output:



Your solution should fulfill the following requirements:

(a) Use ***std::vector*** to store the values using ***push_back*** member function.

(b) Use ***for_each*** function to print the values.

(c) Use ***sort*** function to sort the values in the vector.

(b) Ensure that your program's output matches the provided sample output.

(c) Submit your complete program in a single file.

End of Assignment.