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Subject: DS

Practical 10

Aim: Sorting techniques :
create a data file with 1000 numbers using a random function.

Problem Statement :

The sorting function will read the data file and sort the numbers, storing the sorted numbers in another file.

Coding:

Prac10.cpp

```cpp
#include <iostream>

#include <fstream>

#include <vector>

#include <algorithm>



using namespace std;



// Function to generate a data file with random numbers

void generateDataFile(const string& filename, int size) {

   ofstream file(filename);
```

```
    if (!file.is_open()) {
        cout << "Error opening file for writing." << endl;
        return;
    }

    srand(time(NULL));

    for (int i = 0; i < size; ++i) {
        file << rand() % 1000 << " "; // Assuming random numbers between 0
and 999
    }

    file.close();
}

// Function to read data from a file and perform sorting
void sortDataFile(const string& inputFilename, const string&
outputFilename) {
    ifstream inputFile(inputFilename);
```

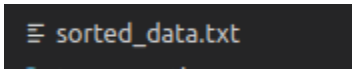
```
if (!inputFile.is_open()) {

    cout << "Error opening input file." << endl;

    return;

}



// Read numbers from the file into a vector

vector<int> numbers;

int num;



while (inputFile >> num) {

    numbers.push_back(num);

}



inputFile.close();



// Sort the numbers

sort(numbers.begin(), numbers.end());



// Write the sorted numbers to the output file
```

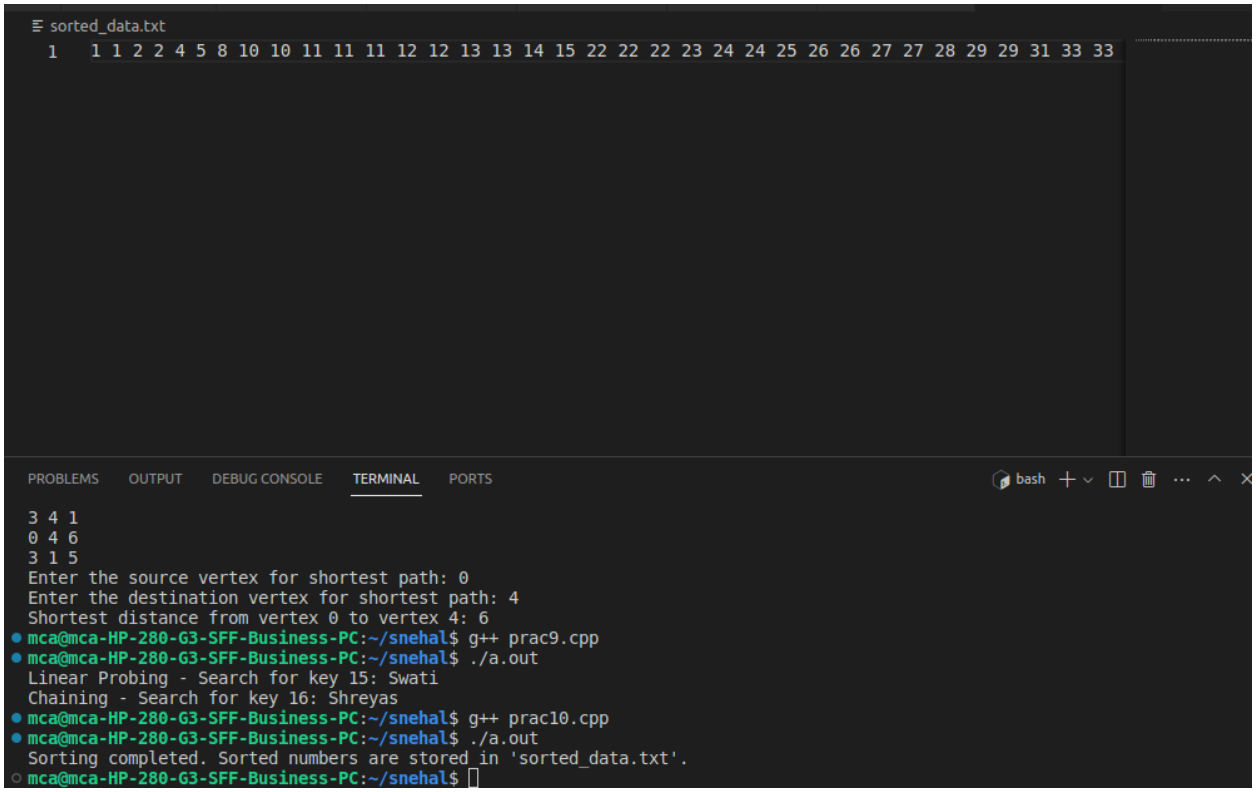
```
    ofstream outputFile(outputFilename);



    if (!outputFile.is_open()) {

        cout << "Error opening output file." << endl;

        return;

    }



    for (int i : numbers) {

        outputFile << i << " ";

    }



    outputFile.close();

}



int main() {

    const string dataFilename = "data.txt";

    const string sortedFilename = "sorted_data.txt";

    const int dataSize = 1000;
```

```
    // Generate the data file with random numbers

    generateDataFile(dataFilename, dataSize);



    // Sort the data file and store the sorted numbers in another file

    sortDataFile(dataFilename, sortedFilename);



    cout << "Sorting completed. Sorted numbers are stored in '" <<
sortedFilename << "'." << endl;



    return 0;

}
```

OUTPUT :

```
mca@mca-HP-280-G3-SFF-Business-PC:~/snehal$ g++ prac10.cpp
mca@mca-HP-280-G3-SFF-Business-PC:~/snehal$ ./a.out
Sorting completed. Sorted numbers are stored in 'sorted_data.txt'.
mca@mca-HP-280-G3-SFF-Business-PC:~/snehal$
```




sorted_data.txt
1 1 1 2 2 4 5 8 10 10 11 11 11 12 12 13 13 14 15 22 22 22 23 24 24 25 26 26 27 27 28 29 29 31 33 33
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
bash
3 4 1
0 4 6
3 1 5
Enter the source vertex for shortest path: 0
Enter the destination vertex for shortest path: 4
Shortest distance from vertex 0 to vertex 4: 6
mca@mca-HP-280-G3-SFF-Business-PC:~/snehal$ g++ prac9.cpp
mca@mca-HP-280-G3-SFF-Business-PC:~/snehal$ ./a.out
Linear Probing - Search for key 15: Swati
Chaining - Search for key 16: Shreyas
mca@mca-HP-280-G3-SFF-Business-PC:~/snehal$ g++ prac10.cpp
mca@mca-HP-280-G3-SFF-Business-PC:~/snehal$ ./a.out
Sorting completed. Sorted numbers are stored in 'sorted_data.txt'.
mca@mca-HP-280-G3-SFF-Business-PC:~/snehal$