Lab Assignment 1

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Name: Prathamesh Sadashiv Gadekar

Roll no.:14

Batch: S1

Class :SE-IT

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#include <cstring>

#include <iostream>

using namespace std;

struct student

{

char student\_name[20];

float SGPA;

int Roll\_no;

};

int n;

class student\_data

{

private :

struct student s1[15];

public :

void viewdata()

{

cout<<"\n\n Student Name SGPA Roll No. \n-----------------------------------------------------\n";

for (int i = 0; i < n; i++)

{

cout<<" "<<i+1<<". "<<s1 [i].student\_name ;

cout<<"\t\t";

cout<<s1[i].SGPA ;

cout<<"\t\t";

cout<<s1[i].Roll\_no<<endl;

}

}

void add()

{ cout<<"\n Enter no. of Student details to be added (max 15) : ";

cin>>n;

cout<<"\n Filling data such as Name, SGPA, Roll no. \n------------------------------------------------------";

for ( int i =0; i <n; i++)

{

cout<<"\n\n# Details of Student no. "<<i+1<<" - \n\n Enter Name of Student : ";

cin>>s1[i].student\_name;

cout<<"\n Enter Student SGPA : ";

cin>>s1[i].SGPA;

cout<<"\n Enter Student Roll no. : ";

cin>>s1[i].Roll\_no;

}

cout<<"---------------- Addition Done Successfully ! ----------------";

student\_data :: viewdata();

}

void search\_sgpa(float r) //linear search on SGPA

{

cout<<"\n\n< Searching in SGPA using Linear Search...>\n-----------------------------------------------";

int t = 0;

for (int i = 0; i < n; i++)

{

if(s1[i].SGPA == r)

{

cout<<"\n\n#"<<t<<" Details of Student with SGPA "<<s1[i].SGPA;

cout<<"\n\n Student Name SGPA Roll\_No.\n"; cout<<" "<<i+1<<". "<<s1[i].student\_name;

cout<<" \t "<<s1[i].SGPA<<" \t "<<s1[i].Roll\_no;

cout<<"\n--------------------------------------------------------------";

t++;

continue;

}

}

if(t == 0)

{

cout<<"\n Student '"<<r<<"' not found or Input correct SGPA";

}

}

void sort\_names() //insertion sort for sorting names

{

for (int k=n-1; k>0; k--)

{

struct student temp = s1[k];

int j = k-1;

while (j >= 0 && strcmp(temp.student\_name, s1[j].student\_name) < 0)

{

s1[j+1] = s1[j];

j = j-1;

}

s1[j+1] = temp;

}

}

void sort\_SGPA(int l, int k) //sorting SGPA using quick sorting

{

int r = k-1;

if (l>=r) return;

int i=l;

int j=r+1;

struct student prec;

int p = s1[l].SGPA; //Select pivot element

prec = s1[l]; //temporarily storing pivot record prec

while(1)

{

do{ i++; } while (s1[i].SGPA < p && i <= r);

do{ j--; } while (s1[j].SGPA > p && j >= l);

if(i >= j) break;

struct student temp;

temp = s1[j];

s1[j] = s1[i];

s1[i] = temp;

}

s1[l] = s1[j];

s1[j] = prec;

sort\_SGPA(l,j-1); //left list

sort\_SGPA(j+1,r); //right list

}

void sort\_RollNo() //sorting roll no. in ascending order using bubble sort

{

for (int i = 0; i < n; i++)

{

for (int j = 0; j < n-1-i; j++)

{

if((s1[j].Roll\_no) > (s1[j+1].Roll\_no)) //Swapping

{

struct student temp;

temp = s1[j];

s1[j] = s1[j+1];

s1[j+1] = temp;

}

}

}

student\_data :: viewdata();

}

void search\_name()

{

cout<<"\n Enter student name to be searched : ";

char search[10];

cin>>search;

cout<<"\n< Searching name using Binary Search...>";

int lower = 0, upper, mid;

upper = n - 1;

mid = (lower + upper)/2;

student\_data :: sort\_names();

while (lower <= upper)

{

if(strcmp(s1[mid].student\_name, search)<0)

{

lower = mid + 1;

}

else if(strcmp(s1[mid].student\_name, search)==0)

{

cout<<"\n\n# Details of Student with name "<<s1[mid].student\_name<<" -";

cout<<"\n\n Student Name SGPA Roll\n No. No.\n--------------------------------------------------------------\n";

cout<<" 1. "<<s1[mid].student\_name;

cout<<" \t "<<s1[mid].SGPA<<" \t "<<s1[mid].Roll\_no;

cout<<"\n--------------------------------------------------------------";

break;

}

else

{

upper = mid - 1;

mid = (lower + upper)/2;

}

}

if(lower > upper)

{

cout<<"\n Student '"<<search<<"' details not found or Input correct name";

}

}

};

int main()

{

student\_data std;

float r;

cout<<"--------------------------------------------------------------------\n\t\t----- SE IT Student Database -----\n--------------------------------------------------------------------\n";

char stopApp;

stopApp = 'Y';

while(stopApp == 'Y')

{

cout<<"\n\nSelect action from following : \n";

cout<<"\n1.ADD RECORDS\t2.SEARCH SGPA\t3.SORT NAME \t4.SORT SGPA(Toppers)\t5.SORT ROLL NO.\t 6. SEARCH NAME\t7. EXIT\n";

cout<<"Enter choice (1/2/3/4/5/6/7): ";

int choice;

cin>>choice;

switch(choice)

{

case 1:

std.add();

break;

case 2:

cout<<"\n Enter Student SGPA to be searched : ";

cin>>r;

std.search\_sgpa(r);

break;

case 3:

cout<<"\n< Sorting name alphabetically using Insertion Sort...>";

std.sort\_names();

std.viewdata();

break;

case 4:

cout<<"\n< Sorting top 10 SGPA using Quick Sort...>";

std.sort\_SGPA(0, 10);

std.viewdata();

break;

case 5:

cout<<"\n< Sorting Roll No. wise using Bubble Sort...>";

std.sort\_RollNo();

break;

case 6:

std.search\_name();

break;

case 7:

cout<<" >Exited successful<\n --| END OF CODE |--";

return 0;

default :

cout<<"\n Invalid choice !";

}

cout<<"\n\nDo you want to continue (Y/N) ? : ";

cin>>stopApp;

if (stopApp == 'N' | 'n')

{

cout<<" ----------------| END OF CODE |----------------\n";

}

}

return 0;

}

OUTPU:

--------------------------------------------------------------------

----- SE IT Student Database -----

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Select action from following :

1.ADD RECORDS 2.SEARCH SGPA 3.SORT NAME 4.SORT SGPA(Toppers) 5.SORT ROLL NO. 6. SEARCH NAME 7. EXIT

Enter choice (1/2/3/4/5/6/7): 1

Enter no. of Student details to be added (max 15) : 15

Filling data such as Name, SGPA, Roll no.

------------------------------------------------------

# Details of Student no. 1 -

Enter Name of Student : PREM

Enter Student SGPA : 6.66

Enter Student Roll no. : 6

# Details of Student no. 2 -

Enter Name of Student : PRAJANYA

Enter Student SGPA : 7.88

Enter Student Roll no. : 7

# Details of Student no. 3 -

Enter Name of Student : Prathamesh

Enter Student SGPA : 8.36

Enter Student Roll no. : 14

# Details of Student no. 4 -

Enter Name of Student : GAURAV

Enter Student SGPA : 5.21

Enter Student Roll no. : 16

# Details of Student no. 5 -

Enter Name of Student : TEJAS

Enter Student SGPA : 7.66

Enter Student Roll no. : 13

# Details of Student no. 6 -

Enter Name of Student : AADESH

Enter Student SGPA : 5.58

Enter Student Roll no. : 46

# Details of Student no. 7 -

Enter Name of Student : ADITYA

Enter Student SGPA : 9.87

Enter Student Roll no. : 39

# Details of Student no. 8 -

Enter Name of Student : SWAPNIL

Enter Student SGPA : 8.12

Enter Student Roll no. : 42

# Details of Student no. 9 -

Enter Name of Student : PRANAV

Enter Student SGPA : 6.23

Enter Student Roll no. : 49

# Details of Student no. 10 -

Enter Name of Student : OM

Enter Student SGPA : 5.39

Enter Student Roll no. : 58

# Details of Student no. 11 -

Enter Name of Student : ADESH

Enter Student SGPA : 6.77

Enter Student Roll no. : 30

# Details of Student no. 12 -

Enter Name of Student : ANAGH

Enter Student SGPA : 6.78

Enter Student Roll no. : 63

# Details of Student no. 13 -

Enter Name of Student : RITESH

Enter Student SGPA : 7.39

Enter Student Roll no. : 64

# Details of Student no. 14 -

Enter Name of Student : HARSH

Enter Student SGPA : 7.28

Enter Student Roll no. : 68

# Details of Student no. 15 -

Enter Name of Student : DHYEY

Enter Student SGPA : 6.17

Enter Student Roll no. : 24

---------------- Addition Done Successfully ! ----------------

Student Name SGPA Roll No.

-----------------------------------------------------

1. PREM 6.66 6

2. PRAJANYA 7.88 7

3. Prathamesh 8.36 14

4. GAURAV 5.21 16

5. TEJAS 7.66 13

6. AADESH 5.58 46

7. ADITYA 9.87 39

8. SWAPNIL 8.12 42

9. PRANAV 6.23 49

10. OM 5.39 58

11. ADESH 6.77 30

12. ANAGH 6.78 63

13. RITESH 7.39 64

14. HARSH 7.28 68

15. DHYEY 6.17 24

Do you want to continue (Y/N) ? : Y

----------------| END OF CODE |----------------

Select action from following :

1.ADD RECORDS 2.SEARCH SGPA 3.SORT NAME 4.SORT SGPA(Toppers) 5.SORT ROLL NO. 6. SEARCH NAME 7. EXIT

Enter choice (1/2/3/4/5/6/7): 2

Enter Student SGPA to be searched : 8.12

< Searching in SGPA using Linear Search...>

-----------------------------------------------

#0 Details of Student with SGPA 8.12

Student Name SGPA Roll\_No.

8. SWAPNIL 8.12 42

--------------------------------------------------------------

Do you want to continue (Y/N) ? : Y

----------------| END OF CODE |----------------

Select action from following :

1.ADD RECORDS 2.SEARCH SGPA 3.SORT NAME 4.SORT SGPA(Toppers) 5.SORT ROLL NO. 6. SEARCH NAME 7. EXIT

Enter choice (1/2/3/4/5/6/7): 3

< Sorting name alphabetically using Insertion Sort...>

Student Name SGPA Roll No.

-----------------------------------------------------

1. AADESH 5.58 46

2. GAURAV 5.21 16

3. PRAJANYA 7.88 7

4. PREM 6.66 6

5. Prathamesh 8.36 14

6. TEJAS 7.66 13

7. ADESH 6.77 30

8. ADITYA 9.87 39

9. PRANAV 6.23 49

10. SWAPNIL 8.12 42

11. OM 5.39 58

12. ANAGH 6.78 63

13. DHYEY 6.17 24

14. RITESH 7.39 64

15. HARSH 7.28 68

Do you want to continue (Y/N) ? : Y

----------------| END OF CODE |----------------

Select action from following :

1.ADD RECORDS 2.SEARCH SGPA 3.SORT NAME 4.SORT SGPA(Toppers) 5.SORT ROLL NO. 6. SEARCH NAME 7. EXIT

Enter choice (1/2/3/4/5/6/7): 4

< Sorting top 10 SGPA using Quick Sort...>

Student Name SGPA Roll No.

-----------------------------------------------------

1. 7.34271e+15 1090644869

2. GAURAV 5.21 16

3. PRAJANYA 7.88 7

4. PREM 6.66 6

5. Prathamesh 8.36 14

6. TEJAS 7.66 13

7. ADESH 6.77 30

8. ADITYA 9.87 39

9. PRANAV 6.23 49

10. SWAPNIL 8.12 42

11. OM 5.39 58

12. ANAGH 6.78 63

13. DHYEY 6.17 24

14. RITESH 7.39 64

15. HARSH 7.28 68

Do you want to continue (Y/N) ? : Y

----------------| END OF CODE |----------------

Select action from following :

1.ADD RECORDS 2.SEARCH SGPA 3.SORT NAME 4.SORT SGPA(Toppers) 5.SORT ROLL NO. 6. SEARCH NAME 7. EXIT

Enter choice (1/2/3/4/5/6/7): 5

< Sorting Roll No. wise using Bubble Sort...>

Student Name SGPA Roll No.

-----------------------------------------------------

1. PREM 6.66 6

2. PRAJANYA 7.88 7

3. TEJAS 7.66 13

4. Prathamesh 8.36 14

5. GAURAV 5.21 16

6. DHYEY 6.17 24

7. ADESH 6.77 30

8. ADITYA 9.87 39

9. SWAPNIL 8.12 42

10. PRANAV 6.23 49

11. OM 5.39 58

12. ANAGH 6.78 63

13. RITESH 7.39 64

14. HARSH 7.28 68

15. 7.34271e+15 1090644869

Do you want to continue (Y/N) ? : Y

----------------| END OF CODE |----------------

Select action from following :

1.ADD RECORDS 2.SEARCH SGPA 3.SORT NAME 4.SORT SGPA(Toppers) 5.SORT ROLL NO. 6. SEARCH NAME 7. EXIT

Enter choice (1/2/3/4/5/6/7): 7

>Exited successful<

--| END OF CODE |--