**Assignment Number : 12**

**Subject :Data Structure and Algorithms**

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**Class : S.E**

**Division: B**

**Batch :B1**

**Title/Problem Statement :**

Write C++ program to store first year percentage of students in array. Write function for sorting array of floating point numbers in ascending order using quick sort and display top five score.

**CODE**

#include<iostream>

#include<limits>

using namespace std;

int l;

int u;

class quick

{

private:

int i,j,cn,size;

float \*a,temp,pivot;

public:

void display();

void getdata();

void sort(int,int);

void top();

};

void quick:: getdata()

{

cout<<"enter the strength of the class"<<endl;

for(;;)

{

if(cin>>size)

{

break;

}

else

{

cout<<"please enter a valid no"<<endl;

cin.clear();

cin.ignore(numeric\_limits<streamsize>::max(), '\n');

}

}

a = new float[size];

l = 0;

u= size -1;

cout<<"enter the percentage of studemts"<<endl;

for(i=0;i<size;i++)

{

for(;;)

{

if(cin>>a[i])

{

if(a[i]>100)

{

cout<<"it is not valid"<<endl;

}

else

{

break;

}

}

else

{

cout<<"please enter a valid no"<<endl;

cin.clear();

cin.ignore(numeric\_limits<streamsize>::max(), '\n');

}

}

}

cout<<"displaying the marks of students"<<endl;

for(i=0;i<size;i++)

{

cout<<a[i]<<endl;

}

}

void quick::sort(int l, int u)

{

if(l<u)

{

pivot=a[l];

i=l;

j=u;

while(i<j)

{

while(a[i] <= pivot && i<j )

i++;

while(a[j]>pivot && i<=j )

j--;

if(i<=j)

{

temp=a[i];

a[i]=a[j];

a[j]=temp;

}

}

temp=a[j];

a[j]=a[l];

a[l]=temp;

cout <<"\n";

sort(l,j-1);

sort(j+1,u);

}

}

void quick :: display()

{

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

cout<<a[i]<<endl;

}

void quick::top()

{

int c;

c=size-1;

if(size<5)

{

cout<<"Top "<<size<<" students are :"<<endl;

do

{

cout<<a[c]<<endl;

c--;

}while(c>=0);

}

else

{

cout<<"top 5 students are"<<endl;

cn=0;

while(cn!=5)

{

cout<<a[c]<<endl;

c--;

cn++;

}

}

}

int main()

{

int ch;

quick o;

do

{

cout<<" enter your choice"<<endl;

cout<<"1.getdata"<<endl<<"2.sort"<<endl<<"3.display"<<endl<<"4.top scores"<<endl<<"0 exit"<<endl;

for(;;)

{

if(cin>>ch)

{

break;

}

else

{

cout<<"please enter a valid no"<<endl;

cin.clear();

cin.ignore(numeric\_limits<streamsize>::max(), '\n');

}

}

switch(ch)

{

case 1:

o.getdata();

break;

case 2:

o.sort(l,u);

break;

case 3:

o.display();

break;

case 4:

o.top();

break;

default:

if(ch!=0)

cout<<"INVALID!!!!!!!!"<<endl;

break;

}

cout<<endl;

}while(ch!=0);

return 0;

}

/\*

OUTPUT

enter your choice

1.getdata

2.sort

3.display

4.top scores

0 exit

1

enetr the strength of the class

6

enter the percentage of studemts

23.4

45.2

67.2

12.3

89.2

45.1

displaying the marks of students

23.4

45.2

67.2

12.3

89.2

45.1

entr yur choice

1.getdata

2.sort

3.display

4.top scores

0 exit

2

enter your choice

1.getdata

2.sort

3.display

4.top scores

0 exit

3

12.3

23.4

45.1

45.2

67.2

89.2

enter your choice

1.getdata

2.sort

3.display

4.top scores

0 exit

4

top 5 students are

89.2

67.2

45.2

45.1

23.4

enter your choice

1.getdata

2.sort

3.display

4.top scores

0 exit

\*/