Object Oriented Programming

Final Exam

By

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**Solution 1:**

#include <iostream>

using namespace std;

void max( int \*arr, int size)

{

//Finding the Largest Value in the Array

int x, y, maxval, maxindice;

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

{

for(y=x+1; y<size; y++)

{

if(\*(arr+x) < \*(arr + y)) {

maxval = \*(arr + y);

maxindice = y;

}

}

}

//Printing out the Max Value

cout << endl;

cout << "Largest number in the Array is " << maxval << " at indice " << maxindice << endl;

}

void min( int \*arr, int size)

{

//Finding the Smallest Value in the Array

int x, y, minval, minindice;

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

{

for(y = x+1; y<size; y++)

{

if(\*(arr+x) > \*(arr+y)) {

minval = \*(arr+y);

minindice = y;

}

}

}

cout << "Smallest number in the Array is " << minval << " at indice " << minindice << endl;

}

void descsort( int \*arr, int size)

{

//Making a Descending Sort Function.

int x, y, temp;

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

{

for(y=x+1; y<size; y++)

{

if(\*(arr + y) > \*(arr + x)) {

temp = \*(arr + x);

\*(arr + x) = \*(arr + y);

\*(arr + y) = temp;

}

}

}

//Printing out the Descending Sort Output

cout << endl;

cout << "Array Sorted into a Descending Order is as follows" << endl;

cout << "--------------------------------------------------" << endl;

cout << "Sorted Array: ";

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

{

cout << \*(arr + x) << " ";

}

}

int main() {

//Defining the size of the Array

int n = 10;

//Creating the array

int num[n];

//Getting User Input for the Array

cout << "Enter the values for Elements of the Array Below" << endl;

cout << "------------------------------------------------" << endl;

cout << endl;

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

{

cout << "Set the Value for Element " << i << ": ";

cin >> num[i];

}

//Printing the initial array for comparison purposes

cout << endl;

cout << "So the array made from these elements is as follows:" << endl;

cout << "----------------------------------------------------" << endl;

cout << endl;

cout << "Array Entered: ";

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

{

cout << num[j] << " ";

}

//Getting the Largest and Smallest Values from the array.

cout << endl;

cout << "Max and Min Values from the Array are as follows:" << endl;

cout << "-------------------------------------------------" << endl;

max(num, n);

min(num, n);

//Sorting the array.

descsort(num, n);

cout << endl;

cout << endl;

return 0;

}

int x, y, temp;

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

{

for(y=x+1; y<size; y++)

{

if(\*(arr + y) > \*(arr + x)) {

temp = \*(arr + x);

\*(arr + x) = \*(arr + y);

\*(arr + y) = temp;

}

}

}

//Printing out the Descending Sort Output

cout << endl;

cout << "Array Sorted into a Descending Order is as follows" << endl;

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cout << "Sorted Array: ";

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

{

cout << \*(arr + x) << " ";

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int main() {

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int n = 10;

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int num[n];

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cout << endl;

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

{

cout << "Set the Value for Element " << i << ": ";

cin >> num[i];

}

//Printing the initial array for comparison purposes

cout << endl;

cout << "So the array made from these elements is as follows:" << endl;

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cout << endl;

cout << "Array Entered: ";

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

{

cout << num[j] << " ";

}

//Getting the Largest and Smallest Values from the array.

cout << endl;

cout << "Max and Min Values from the Array are as follows:" << endl;

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max(num, n);

min(num, n);

//Sorting the array.

descsort(num, n);

cout << endl;

cout << endl;

return 0;

}

//Making a Descending Sort Function.

int x, y, temp;

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

{

for(y=x+1; y<size; y++)

{

if(\*(arr + y) > \*(arr + x)) {

temp = \*(arr + x);

\*(arr + x) = \*(arr + y);

\*(arr + y) = temp;

}

}

}

//Printing out the Descending Sort Output

cout << endl;

cout << "Array Sorted into a Descending Order is as follows" << endl;

cout << "--------------------------------------------------" << endl;

cout << "Sorted Array: ";

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

{

cout << \*(arr + x) << " ";

}

}

int main() {

//Defining the size of the Array

int n = 10;

//Creating the array

int num[n];

//Getting User Input for the Array

cout << "Enter the values for Elements of the Array Below" << endl;

cout << "------------------------------------------------" << endl;

cout << endl;

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

{

cout << "Set the Value for Element " << i << ": ";

cin >> num[i];

}

//Printing the initial array for comparison purposes

cout << endl;

cout << "So the array made from these elements is as follows:" << endl;

cout << "----------------------------------------------------" << endl;

cout << endl;

cout << "Array Entered: ";

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

{

cout << num[j] << " ";

}

//Getting the Largest and Smallest Values from the array.

cout << endl;

cout << "Max and Min Values from the Array are as follows:" << endl;

cout << "-------------------------------------------------" << endl;

max(num, n);

min(num, n);

//Sorting the array.

descsort(num, n);

cout << endl;

cout << endl;

return 0;

}

cout << "Array Entered: ";

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

{

cout << num[j] << " ";

}

cout << endl;

cout << "Max and Min Values from the Array are as follows:" << endl;

cout << "-------------------------------------------------" << endl;

max(num, n);

min(num, n);

//Sorting the array.

descsort(num, n);

cout << endl;

cout << endl;

return 0;

}

cout << "So the array made from these elements is as follows:" << endl;

cout << "----------------------------------------------------" << endl;

cout << endl;

cout << "Array Entered: ";

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

{

cout << num[j] << " ";

}

//Getting the Largest and Smallest Values from the array.

cout << endl;

cout << "Max and Min Values from the Array are as follows:" << endl;

cout << "-------------------------------------------------" << endl;

max(num, n);

min(num, n);

//Sorting the array.

descsort(num, n);

cout << endl;

cout << endl;

return 0;

}

**Solution 2:**

#include <iostream>

#include <algorithm>

using namespace std;

//Creating the structure

struct professor {

string FirstName;

string LastName;

float Height;

int Age;

};

struct professor arr[10];

//Calculating the Sum of height and age of each Professor and finding the highest sum

void maxSum(professor \*arr){

int sum = 0,ind;

for (int i = 0; i < 10; i++){

if(arr[i].Age+arr[i].Height > sum){

sum = arr[i].Age+arr[i].Height;

ind = i;

}

}

//Printing the name and last name of the Professor with the highest sum

cout<<"First Name: " <<arr[ind].FirstName<<endl

<<"Last Name : " <<arr[ind].LastName<<endl;

}

//Getting structure value from user for each element of array (10 structure value should enter by user)

int main(){

for(int i=0;i<10;i++){

cout<<"Firstname : ";

cin>>arr[i].FirstName;

cout<<arr[i].FirstName<<endl;

cout<<"Lastname : ";

cin>>arr[i].LastName;

cout<<arr[i].LastName<<endl;

cout<<"Height : ";

cin>>arr[i].Height;

cout<<arr[i].Height<<endl;

cout<<"Age : ";

cin>>arr[i].Age;

cout<<arr[i].Age<<endl;

cout<<"------------------------"<<endl;

}

maxSum(arr);

}

cout<<"------------------------"<<endl;

}

//Getting the maxing sum of the array

maxSum(arr);

return 0;

}

**Solution 3:**

#include <iostream>

#include <string>

#include <algorithm>

using namespace std;

//Creating the class

class People {

private:

string firstname;

string lastname;

int age;

//Initialize private attributes with constructor

public:

People(string x=" ", string y=" ", int z= 0 )

{

firstname = x;

lastname = y;

age = z;

}

//Initialize private attributes with set function

void setFirstname(string s){

firstname = s;

}

void setLastname(string s){

lastname = s;

}

void setAge(int temp){

age = temp;

}

//Returns the value of the private attributes with get function

string getFirstname(){

return firstname;

}

string getLastname(){

return lastname;

}

int getAge(){

return age;

}

//Sort ages in ascending order

void sorter(People \*arr){

for(int i=1;i<=10;i++){

for (int j = 1; j <= 9; j++)

if (arr[j].getAge() > arr[j+1].getAge())

swap(arr[j], arr[j+1]);

}

}

};

int main(){

People arr[11];

//Printing result with the test value

string names[10] = {"test1","test2","test3","test4","test5","test6",

"test7","test8","test9","test10"};

string surnames[10] = {"test1","test2","test3","test4","test5","test6",

"test7","test8","test9","test10"};

int ages[10] = {30,21,4,2,11,10,50,23,85,25};

//Differentiate the test value

for(int i=1;i<=10;i++){

//Values with index less than 4 must be initialize by constructor

if(i<=4){

arr[i] = {names[i-1],surnames[i-1],ages[i-1]};

} else {

arr[i].setFirstname(names[i-1]);

arr[i].setLastname(surnames[i-1]);

arr[i].setAge(ages[i-1]);

}//Values with index more than 4 must be initialize by set function

}

//Printing values based on ascending order of age

People inst;

inst.sorter(arr);

for(int i=1;i<=10;i++){

cout<<arr[i].getFirstname()<<" "<<arr[i].getLastname()<<" "<<arr[i].getAge()<<endl;

}

}

//Returns the value of the private attributes with get function

string getFirstname(){

return firstname;

}

string getLastname(){

return lastname;

}

int getAge(){

return age;

}

//Sort ages in ascending order

void sorter(People \*arr){

for(int i=1;i<=10;i++){

for (int j = 1; j <= 9; j++)

if (arr[j].getAge() > arr[j+1].getAge())

swap(arr[j], arr[j+1]);

}

}

};

int main(){

People arr[11];

//Printing result with the test value

string names[10] = {"test1","test2","test3","test4","test5","test6",

"test7","test8","test9","test10"};

string surnames[10] = {"test1","test2","test3","test4","test5","test6",

"test7","test8","test9","test10"};

int ages[10] = {30,21,4,2,11,10,50,23,85,25};

//Differentiate the test value

for(int i=1;i<=10;i++){

//Values with index less than 4 must be initialize by constructor

if(i<=4){

arr[i] = {names[i-1],surnames[i-1],ages[i-1]};

} else {

arr[i].setFirstname(names[i-1]);

arr[i].setLastname(surnames[i-1]);

arr[i].setAge(ages[i-1]);

}//Values with index more than 4 must be initialize by set function

}

//Printing values based on ascending order of age

People inst;

inst.sorter(arr);

for(int i=1;i<=10;i++){

cout<<arr[i].getFirstname()<<" "<<arr[i].getLastname()<<" "<<arr[i].getAge()<<endl;

}

}

for(int i=1;i<=10;i++){

cout<<arr[i].getFirstname()<<" "<<arr[i].getLastname()<<" "<<arr[i].getAge()<<endl;

}

return 0;

}