##### OBJECT ORIENTED PROGRAMMING LAB

##### LAB RECORD

###### ***Submitted by***

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**Lab Exercise 2: Revisiting C**

**Q1. Write a function that finds the minimum and the maximum value in an array of N integers. Inputs to the function are the array of integers, an integer variable containing the length of the array and pointers to integer variables that will contain the minimum and the maximum values. The function prototype is:**

**void minmax( int array[], int length, int \* min, int \* max);**

**Write a main function that uses this function to find and display the minimum and the maximum values of an array of integers.**

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

//This program is developed by Tanishq Agarwal (Er. No:211B326)

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#include <iostream>

using namespace std;

void minmax(int array[],int length,int \*minq,int \*maxq) //function declaration and definition

{

\*maxq=array[0];

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

if(array[i]>(\*maxq)){

\*maxq=array[i];

}

}

\*minq=array[0];

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

if(array[i]<(\*minq)){

\*minq=array[i];

}

}

return ;

}

int main() //Driver Main function

{

int len,minq,maxq=0;

cout<<"Enter an array of integers..\n";

cout<<"Enter the array size first:";

cin>>len;

int \*n= new int[len];

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

cout<<"Enter element at position"<<i<<":\n";

cin>>n[i];

}

minmax(n,len,&minq,&maxq);

cout<<"The maximum value in the array is:"<<maxq;

cout<<"The minimum values is the array is:"<<minq;

} return 0;

}

**Q2. Write a program to generate random numbers in given range [m, n].**

**Test case :**

**Input: m=10, n=50**

**Output: 34**

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#include <iostream>

using namespace std;

int question2(int l,int u){

srand((unsigned)time(NULL));

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

int random = l + (rand()%((u-l)+1));

cout<<random<<endl;

}

return 0;

}

int main() //main function declaration

{

cout<<"Set lower and upper limits of the random number generator profile:";

cin>>a>>b;

question2(a,b); // function calling

return 0;

}

**Q3. Write a function to reverse an array of long double types. Call this function from main function.**

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

//This program is developed by Tanishq Agarwal (Er. No:211B326)

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#include <iostream>

using namespace std;

int question3(long double ar[],int sz) // function declaration and definition

{

long double ar2[sz];

int j=0;

for(j=0;j<sz;j++){

ar2[j]=ar[sz-j];

}

for(j=0;j<sz;j++){

cout<<"The element at the position "<<j<<" in the new array is:"<<ar2[j]<<"\n";

}

return 0;

}

int main() // Driver main() Function

{

cout<<"Enter size of the long double array:";

int sz=0;

cin>>sz;

long double \*test=new long double[sz];

for(int x=0;x<sz;x++){

cout<<"Enter the value of original array for position "<<x<<"\n";

cin>>test[x];

}

question3(test,sz);

return 0;

}

**Q4. Write a program to perform the addition of two matrices**.

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

//This program is developed by Tanishq Agarwal (Er. No:211B326)

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#include <iostream>

using namespace std;

int question4() // function declaration and definition

{

int len=0;

int i,j=0;

cout<<"Enter the order of A and B matrix to be added:";

cin>>len;

int a[len][len];

int b[len][len];

int sum[len][len];

for(i=0;i<len;i++){

for(j=0;j<len;j++){

cout<<"Enter the value for A matrix at position A "<<"["<<i<<"]"<<" "<<"["<<j<<"]";

cin>>a[i][j];

}

}

for(i=0;i<len;i++){

for(j=0;j<len;j++){

cout<<"Enter the value for B matrix at position B "<<"["<<i<<"]"<<" "<<"["<<j<<"]";

cin>>b[i][j];

}

}

for(i=0;i<len;i++){

for(j=0;j<len;j++){

sum[i][j]=a[i][j]+b[i][j];

}

}

for(i=0;i<len;i++){

for(j=0;j<len;j++){

cout<<"The value for SUM matrix at position SUM "<<"["<<i<<"]"<<" "<<"["<<j<<"]"<<"is:"<<sum[i][j]<<"\n";

}

}

return 0;

}

int main() // Driver main() Function

{

question4();

return 0;

}

**Advanced Practice Problems:**

**Q1. Write a C++ program to find the highest occurring digit in prime numbers in a given range.**

**Given a range L to R, the task is to find the highest occurring digit in prime numbers lie between L and R (both inclusive). If multiple digits have same highest frequency print the largest of them. If no prime number occurs between L and R, output -1.**

**Examples:**

**Input : L = 1 and R = 20.**

**Output : 1**

**Prime number between 1 and 20 are 2, 3, 5, 7, 11, 13, 17, 19.**

**1 occur maximum i.e 5 times among 0 to 9.**

//\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

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#include <iostream>

using namespace std;

int app1() // function declaration and definition

{

int i,a,b,arcnt=0,ctr=0,maxo;

int count[10]={0,0,0,0,0,0,0,0,0,0};

int pn[10];

cout<<"Enter the values for upper limit and lower limit for check:";

cin>>a>>b;

for(i=a;i<=b;i++){

for(int j=1;j<=b;j++){

if(i%j==0){

ctr++;

}

}

if(ctr<=2){

pn[arcnt]=i;

arcnt++;

}

ctr=0;

}

for(i=0;i<arcnt;i++) {

while(pn[i]>0) {

count[pn[i]%10]++;

pn[i]=pn[i]/10;

}

}

maxo=count[0];

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

if(count[i]>maxo)

maxo=count[i];

}

for(i=9;i>=0;i--) {

if(count[i]==maxo) {

cout << "Digit: " << i << endl;

break;

}

}

return 0;

}

int main() // Driver main() Function

{

app1(); //function calling

return 0;

}