##### OBJECT ORIENTED PROGRAMMING LAB

##### LAB RECORD

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

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**Table of Contents**

|  |  |
| --- | --- |
| **Lab Exercise with topic** | **Page No.** |
| Lab Exercise 1: Revisiting C | 3 |
| Lab Exercise 2: Revisiting C | 8 |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**Lab Exercise 1: Revisiting C**

***//1. Write a program to find the number of digits in a given number.***

#include<stdio.h>

void main(){

long long int i,n;

printf("Enter the Number = ");

scanf("%lli",&n);

for(i=0;n>0;i++,n/=10);

printf("%d",i);

}

***//2. Write a program to calculate factorial of a number N using recursion.***

#include<stdio.h>

int fact(int n);

void main(){

int n;

printf("Enter the Number = ");

scanf("%d",&n);

printf("\n%d",fact(n));

}

int fact(int n){

int f=n;

if(n==1){

return 1;

}

else{

return (fact(n-1)\*f);

}

}

***//3. Write a program to print �Hello JUET!� without main() function.***

#include<stdio.h>

void phello(void);

void main()

{

phello();

}

void phello(void){

printf("Hello JUET!");

}

***//4.Write a program to print "Hello JUET !" without using any semicolon.***

#include<stdio.h>

void main(){

switch(printf("hello world")){}

}

***//5. Write a program to round off an integer �i� to the next largest multiple of another //integer //�j�. For example, you will get 259 if i=256 is rounded off to the next largest //multiple of j=7.***

#include<stdio.h>

void main(){

int i,j;

printf("Enter the Number i and j = ");

scanf("%d %d",&i,&j);

//i=(i-1)+(i%j);

while(i%j!=0){

i++;

}

printf("%d %d",i,j);

}

***//6. Write a program which finds a four digit number AABB which is a perfect square.***

***//A and B represent different digits. For example 7744 is a four digit perfect square***

***//number which is also satisfying the condition AABB ie.***

***//first two digits (AA=77) are same and last two digits (BB=44) are same.***

#include<stdio.h>

int sqr(int x);

void main(){

int i,j,A,B;

for(A=1;A<10;A++){

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

j=A\*1000+A\*100+B\*10+B\*1;

sqr(j);

}

}

}

int sqr(int x){

int i;

for(i=0;i<x/4;i++){

if(i\*i==x){printf("%d %d\n",x,i);}

}

***//7. Write a function which takes a string as input from user and returns the length of that //string without using any string library functions. Call this function from mail function.***

#include<stdio.h>

int len(char \*c);

void main(){

char str[20];

printf("Enter the String = ");

scanf("%s",str);

printf("Length of string = %d",len(str));

}

int len(char \*c){

int i=0;

while(c[i]!='\0'){

i++;

}

return i;

}

***//8. Write a function strcat(s,t) which concatenates the string t to the end of string s.***

***//Call this function from main function.***

#include<iostream>

#include<string.h>

using namespace std;

void Strcat(char s[],char t[]);

int main(){

char s[50],t[50];

cout<<"Enter the String 1 = ";

cin>>s;

cout<<"Enter the String 2 = ";

cin>>t;

//cout<<"Concatenated String = "<<

Strcat(s,t);

return 0;

}

void Strcat(char ns[],char t[]){

int i=0,k=0,l1,l2;

l1=strlen(ns);

l2=strlen(t);

for(i=l1;i<l1+l2;i++,k++){

ns[i]=t[k];

}

ns[i+1]='\0';

cout<<"new String = "<<ns<<endl;

}

**Advance practice problems -**

***//1. Given an array A of size N-1 and given that there are numbers from 1 to N with one //element missing;***

***// Write program to find the missing number.***

***// Test case 1: Given array: 1 2 3 5; missing element is 4.***

***// Test case 2: Given array: 1 2 3 4 5 6 7 8 10; missing element is 9.***

#include<iostream>

using namespace std;

int main(){

int n,m=0;

cout<<"Enter the Size = ";

cin>>n;

int A[n-1];

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

cout<<"Enter the Values = ";

cin>>A[i];

if(((A[i])-A[i-1])!=1){

m=(A[i]-1);

}

}

cout<<"Given Array is => ";

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

cout<<A[i]<<" ";

}

cout<<endl<<"Missing number is "<<m;

return 0;

}

***/\* 2. Write the function strend(s,t), which returns 1 if the string t occurs at the end of the string s, and zero otherwise.***

***Sample Test case1:***

***Input:***

***s=”Object Oriented Programming using C++”***

***t=”Using C++”***

***Output: 1***

***Sample Test case2:***

***Input:***

***s=”Object Oriented Programming using C++”***

***t=”Programming”***

***Output: 0 \*/***

#include<iostream>

#include<string.h>

using namespace std;

int strend(char s[], char t[]);

int main()

{

char s[100],t[50];

cout<<"Enter the the String, s = ";

cin>>s;

cout<<"Enter the String to be checked, t = ";

cin>>t;

cout<<"Output = "<<strend(s,t);

}

int strend(char s[], char t[]){

char c[50];

int l1,l2,k=0;

l1=strlen(s);

l2=strlen(t);

for(int i=(l1-l2);(i<l1);i++,k++){

c[k]=s[i];

}

c[k]='\0';

if(strcmp(t,c)==0){

return 1;

}

else{

return 0;

}

}

**Lab Exercise 2: Revisiting C**

***/\* 1. 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. \*/***

#include<iostream>

using namespace std;

int minmax(int ar[],int l, int \*min,int \*max);

int main(){

int n,max=INT32\_MIN,min=INT32\_MAX;

cout<<"Enter the Number of Elements = ";

cin>>n;

int ar[n];

cout<<"Enter the values"<<endl;

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

cin>>\*(ar+i);

}

minmax(ar,n,&min,&max);

cout<<endl<<"maximum value = "<<max;

cout<<endl<<"minimum value = "<<min;

}

int minmax(int ar[],int l, int \*min,int \*max){

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

if(ar[i]<\*min){

\*min=ar[i];

}

if(ar[i]>\*max){

\*max=ar[i];

}

cout<<"min= "<<\*min<<" max= "<<\*max<<endl;

}

return 0;

}

***// 2. Write a program to generate random numbers in given range [m, n].***

***// Test case :***

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

***// Output: 34***

#include <stdio.h>

#include <stdlib.h>

#include <time.h>

void main () {

int i,m,n;

time\_t t;

printf("Enter the Range = ");

scanf("%d %d",&m,&n);

srand((unsigned)time(&t));

for( i = m ; i < n ; i++ ) {

printf("%d\n", rand() % n);

}

}

***//3. Write a function to reverse an array of long double types. Call this function from main function.***

#include<stdio.h>

int n;

int rev(long double ar[]);

int main(void){

printf("Enter the Array Size = ");

scanf("%d",&n);

long double arr[n];

printf("Enter the Values of array=>");

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

scanf("%Lf",&arr[i]);

}

rev(arr);

return 0;

}

int rev(long double ar[]){

for(int i=0;i<n/2;i++){

int t=ar[i];

ar[i]=ar[n-1-i];

ar[n-1-i]=t;

}

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

printf("%Lf\n",ar[i]);

}

return 0;

}

***//4. Write a program to perform the addition of two matrices.***

#include<stdio.h>

void main(){

int A[3][3]={{1,2,3},{4,5,6},{7,8,9}};

int B[3][3]={{9,8,7},{6,5,4},{3,2,1}};

int ApB[3][3];

for(int i=0;i<3;i++){

for(int j=0;j<3;j++){

ApB[i][j]=A[i][j]+B[i][j];

}

}

for(int i=0;i<3;i++){

for(int j=0;j<3;j++){

printf("%d ",ApB[i][j]);

}

printf("\n");

}

}

**Advance practice problems-**

/\* 1. 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.\*/

#include<stdio.h>

static int nf[10];

int frq(int n){

static int n0=0,n1=0,n2=0,n3=0,n4=0,n5=0,n6=0,n7=0,n8=0,n9=0;

for(int i=0;n>0;i++){

int rm=n%10;

n=n/10;

rm==0?nf[0]++:(rm==1?nf[1]++:(rm==2?nf[2]++:(rm==3?nf[3]++:(rm==4?nf[4]++:(rm==5?nf[5]++:(rm==6?nf[6]++:(rm==7?nf[7]++:(rm==8?nf[8]++:(rm==9?nf[9]++:n9)))))))));

}

}

int main(){

int l,r,ele,max=0;

nf[10]=0;

printf("Enter the Range from L = ");

scanf("%d",&l);

printf("To = ");

scanf("%d",&r);

for(int i=l+1;i<r;i++){

int d=0;

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

if(i%j==0)

d++;

}

if(d<=2){

frq(i);

}

}

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

if(nf[i]>=max){

max=nf[i];

ele=i;

}

}

printf("%d",ele);

return 0;

}