**DATA STRUCTURES LAB**

LAB RECORD

submitted by

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**Table of content**

|  |  |
| --- | --- |
| Lab Exercise with Topic | Page No. |
| Lab Exercise 1: Revisiting C |  |
| Lab Exercise 2: Revisiting C |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

**Lab Exercise 1: Revisiting C**

***//1. WAP to find out largest element of an array.***

#include<iostream>

//#include<conio.h>

using namespace std;

int main(){

int l=0,ar[6]={4,2,1,5,3,6};

for(int i=0;i<6;i++){

if(ar[i]>l){l=ar[i];}

}

cout<<l<<endl;

// getch();

return 0;

}

***//2. WAP to search an element in array.***

#include<iostream>

//#include<conio.h>

using namespace std;

int main(){

int e,arr[6]={2,5,3,1,7,8};

cin>>e;

for(int i=0;i<6;i++){

if(e==arr[i]){

cout<<"element found at index = "<<i<<endl;

break;

}

}

// getch();

return 0;

}

***//3. WAP to check whether the number is prime or not.***

#include<iostream>

//#include<conio.h>

using namespace std;

int main(){

int n,d=0;

cin>>n;

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

if(n%i==0){

d++;

if(d>2){

cout<<"Element is not Prime"<<endl;

break;

}

}

}

if(d<=2){

cout<<"Element is Prime"<<endl;

}

// getch();

return 0;

}

***//4. WAP to calculate xy where x and y are two integer numbers entered by the user. [do not use pow() function]***

#include<iostream>

//#include<conio.h>

using namespace std;

int main(){

int x,y,a=1;

cin>>x>>y;

while(y--){

a\*=x;

}

cout<<a;

// getch();

return 0;

}

***//5. WAP to replace a character by another character in a string. Take both the choices from the user.***

#include<iostream>

//#include<conio.h>

using namespace std;

int main(){

string s="qwerty";

cout<<s<<endl;

char x,y;

cin>>x>>y;

for(int i=0;s[i]!='\0';i++){

if(s[i]==x){

s[i]=y;

}

}

cout<<s<<endl;

// getch();

return 0;

}

***//6. WAP to find the reverse of given string.***

#include<iostream>

#include<cstring>

//#include<conio.h>

using namespace std;

int main(){

char s1[]="hello123";

cout<<s1<<endl;

int l=strlen(s1);

cout<<l;

char s2[l];

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

l--;

s2[i]=s1[l-1];

}

cout<<s2<<endl;

//getch();

return 0;

}

***//7.WAP to sort the array and ask the choice from user for ascending/descending***

#include<iostream>

using namespace std;

int main(){

int arr[10]={2,5,10,7,1,9,4,3,6,8};

char ch;

cin>>ch;

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

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

if(arr[i]<arr[j] && ch=='d'){

arr[j]=arr[j]+arr[i];

arr[i]=arr[j]-arr[i];

arr[j]=arr[j]-arr[i];

}

else if(arr[i]>arr[j]&& ch=='a'){

arr[j]=arr[j]+arr[i];

arr[i]=arr[j]-arr[i];

arr[j]=arr[j]-arr[i];

}

}

}

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

cout<<arr[i]<<endl;

}

return 0;

}

**Lab Exercise 2: Revisiting C**

***//1. WAP to generate a Fibonacci series up to n terms.***

#include<iostream>

using namespace std;

int main(){

int a=0,b=1,n;

cout<<"Enter the number = ";

cin>>n;

cout<<a<<" "<<b;

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

b=a+b;

a=b-a;

cout<<" "<<b;

}

return 0;

}

***//2. WAP to find out series sum of 1^2 + 2^2 + .... + n^2***

#include<iostream>

using namespace std;

int main(){

int sn,n;

cout<<"Enter thew value of n = ";

cin>>n;

sn=(n\*(n+1)\*(2\*n+1))/6;

cout<<"sum of n^2 terms = "<<sn<<endl;

return 0;

}

***//3. WAP to find out GCD of two numbers.***

#include<iostream>

using namespace std;

int main(){

int a,b,cd;

cout<<"Enter the 2 numbers = ";

cin>>a>>b;

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

if(a%i==0 && b%i==0){cd=i;}

}

cout<<cd<<endl;

return 0;

}

***//4. WAP to multiply two numbers by using addition.***

#include<iostream>

using namespace std;

int main(){

int a,b,m=0;

cin>>a>>b;

while(b--){

m=m+a;

}

cout<<m<<endl;

return 0;

}

***//5. WAP to convert a binary number into decimal.***

#include<iostream>

#include<math.h>

using namespace std;

int main(){

int a,b,d=0;

cin>>a;

for(int i=0;a!=0;i++){

d=d+(a%10)\*pow(2,i);

a=a/10;

}

cout<<d<<endl;

return 0;

}

***//6. WAP to convert a decimal into binary number.***

#include<iostream>

using namespace std;

int main(){

int d,b=0,m=1,B=0;

cin>>d;

for(int i=0;d!=0;i++){

if(d%2==0){

b=(b\*10)+0;

if(b==0){

m=m\*10;

}

}

else{

b=(b\*10)+1;

}

d=d/2;

}

for(int i=0;b!=0;i++){

B=(B\*10)+(b%10);

b/=10;

cout<<B<<" "<<b<<endl;

}

B=B\*m;

cout<<B;

return 0;

}

***//7. WAP to display lower triangular matrix of a given n by n size matrix entered by user.***

#include<iostream>

using namespace std;

int main(){

int n;

cin>>n;

int \*\*arr = new int\*[n];

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

arr[i]=new int[n];

}

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

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

if(i+j+2<=(n+1)){

arr[i][j]=0;

}

else{

arr[i][j]=i+j+2;

}

}

}

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

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

cout<<arr[i][j]<<"\t";

}

cout<<'\n';

}

for(int i=0;i<n;i++){delete [] arr[i];}

delete [] arr;

return 0;

}

***//8. WAP to find out nCr factor of given numbers.***

#include<iostream>

using namespace std;

int fact(int n){

int f=1;

for(int i=1;i<=n;i++){f=f\*i;}

return f;

}

int main(){

int n,r,res;

cin>>n>>r;

res=fact(n)/(fact(n-r)\*fact(r));

cout<<res<<endl;

return 0;

}