

### Lab Exercise -2A

1. **Write a program to display "Lets start programming" on the standard output device.**

```
#include<iostream.h>
main()
{
    cout<< "lets start programming";
}
```

2. **Write a program to accept and display 2 integer values.**

```
#include<iostream.h>
main()
{
    int a,b;
    cout<<"Enter any two integer values";
    cin>>a>>b;
    cout<<"The accepted numbers are" << a <<b;
}
```

3. **Write a program to accept & display all vowels.**

```
#include<iostream.h>
main()
{
    char a,b,c,d,e;
    cout<<"Enter all vowels";
    cin>>a>>b>>c>>d>>e;
    cout<<"Entered vowels are" <<a<<b<<c<<d<<e;
}
```

4. Write a program to accept 2 numbers and display the value obtained by raising one to other.  
(eg: given 2 and 3, the result should be displayed as 8).

```
#include<iostream.h>
#include<math.h>
Main()
{
    Int a,b,c;
    Cout<<"Enter any two numbers";
    Cin>>a>>b;
    C = pow(a,b);
    Cout<< c;
}
```

```
#include<iostream.h>
int power(int b, int e);
main()
{
    int x,y;
    cin>>x>>y;
    cout << power(x,y);
}
int power(int b,int e)
{
    int r = 1;
    for(int i = 0; i < e; ++i)
        r *=b;
    return r;
}
```

5. **Write a program which given 2 numbers, calculates their sum, difference, multiplication and division.**

```
#include<iostream.h>
#include<conio.h>
main()
{
int a,b,s,d,m,di;
clrscr();
cout<<"Enter any two numbers";
cin>>a>>b;
s = a+b;
d = a-b;
m = a*b;
di = a/b;
cout<<"The sum of two numbers are "<<s<<endl;
cout<<"The difference of two numbers are"<<d<<endl;
cout<<"The multiplication of two numbers are"<<m<<endl;
cout<<"The division of two numbers are"<<di<<endl;
}
```

6. **Write a program to receive the two numbers in variables, and then swap the values of variables.**

```
#include<iostream.h>
#include<conio.h>
main()
{
clrscr();
int a,b,t;
cout<<"Enter any two numbers";
cin>>a>>b;
t =b;
b = a;
a=t;
cout<<"The swapped numbers are"<<a<<b;
}
```

7. **Write program which accepts an amount, time period and rate of interest and calculates the simple interest.**

```
#include<iostream.h>
#include<conio.h>
void main()
{
    int a,t, r,s;
    clrscr();
    cout<<"Enter the amount, time of period and rate of interst";
    cin>>a>>t>>r;
    s= (a*t*r)/100;
    cout<<"The simple interst is"<<s;
}
```

### Lab Exercise -3

1. **Write a program to display a list of all odd and even numbers from 1 to 100.**

```
#include<iostream.h>
#include<conio.h>
main()
{
    int i;
    clrscr();
    cout<<"Even numbers are";
    for(i=1;i<=100;i++)
    if(i%2==0) cout<< i<<"\t";
    cout<<endl<<"Odd numbers are";
    for(i=1;i<=100;i++)
    if(i%2 != 0) cout<<i<<"\t";
}
```

2. **Write a program to accept an alphabet and display if it is a vowel or not and which one. Do this program using 'if' and using 'switch'.**

```
#include<iostream.h>
#include<conio.h>
main()
{
char c;
cout<<"Enter any one alphabet";
cin>>c;
if(c=='a'||c=='e'||c=='i'||c=='o'||c=='u')
cout<<"Entered character is vowel";
else
cout<<"Entered character is not a vowel";
}
```

```
#include<iostream.h>
#include<conio.h>
main()
{
clrscr();
char c;
cout<<"Enter any one alphabet";
cin>>c;
switch(c)
{
case 'a':
cout<<"Entered alphabet is vowel"<<c;
break;
case 'e':
cout<<"Entered alphabet is vowel"<<c;
break;
case 'i':
cout<<"Entered alphabet is vowel"<<c;
break;
case 'o':
cout<<"Entered alphabet is vowel"<<c;
break;
case 'u':
cout<<"Entered alphabet is vowel"<<c;
break;
}
```

**default:**

```
cout<<"Entered alphabet is not a vowel"<<c;
}
}
```

3. **Write a program to**

- 1. Accept a temperature in centigrade and convert it to Fahrenheit.**
- 2. Accept a temperature in Fahrenheit and convert it to centigrade.**

```
#include<iostream.h>
```

```
main()
```

```
{
int c,f ;
cout<<"Enter centigrade value";
cin>>c;
f= 32+((9*c)/5);
cout<<f;
}
```

```
#include<iostream.h>
```

```
main()
```

```
{
int c,f ;
cout<<"Enter fahrenheit value";
cin>>f;
c= ((f-32)*5)/9;
cout<<c;
}
```

**4. A book and stationary store decides to give its customers 10% discount on a purchase greater than 10,000/-. The program should accept the quantity purchased the price of the items and then calculate the amount payable. Further based on the total amount, appropriate discount should be given and final payable amount should be displayed.**

```
#include<iostream.h>
main()
{
int p,q,t,d ;
cout<<"Enter price of product and quantity values";
cin>>p>>q;
t=p*q;
if(t>10000)
{
d= t*10/100;
t=t-d;
cout<<"Payable amount is"<<t;
}
else
cout<<"Payable amount is"<<t;
}
```

**5. Write a program to accept a number and display if it is an Armstrong number. (hint: Armstrong number is a number, whose every digit cubed and totaled results in the same number, eg:  $153=1^3+5^3+3^3=153$ ).**

```
#include<iostream.h>
main()
{
int p,q,r,d ;
cout<<"Enter any three digit number";
cin>>p;
q=p;
while(q != 0)
{
r= q%10;
d= d+r*r*r;
q=q/10;
}
cout<<p;
if (p == d) cout<<" is armstrong number";
else cout<<" is not a armstrong number";
}
```

**6. Write a program to accept an year and display whether it is leap year or not. (using && and || logical operators).**

```
#include<iostream.h>
main()
{
int y;
cout<<"Enter year in yyyy format";
cin>>y;
if (y%4 ==0 || y%400 ==0)
cout<<"It is a leap year";
else cout<<"It is not a leap year";
}
```

**7. Write a program to accept 3 numbers and find the greatest of them, using if.....else statements.**

```
#include<iostream.h>
main()
{
int x,y,z,b;
cout<<"Enter three numbers";
cin>>x>>y>>z;
if (x>y)
b=x;
else b=y;
if(b<z)
cout<<"Biggest value is"<<z;
else cout<<"Biggest values is"<<b;
}
```



8. Write a program to accept 5 subject marks and then display the grades as under:

<b>&gt;=60%</b>	<b>Grade A</b>
<b>50% - 59%</b>	<b>Grade A-</b>
<b>40% - 49%</b>	<b>Grade B+</b>
<b>&lt;=40%</b>	<b>Grade B-</b>

```
#include<iostream.h>
main()
{
int a,b,c,d,e,t,av;
cout<<"Enter five subject marks";
cin>>a>>b>>c>>d>>e;
t=a+b+c+d+e;
av = t/5;
if (av>=60)
cout<<"Grade is A";
else if(av>=50 &&av<60) cout<<"Grade is A-";
else if(av>=40 && av<50) cout<<"Grade is B+";
else cout << "Grade is B-";
}
```

### **Lab Exercise-4**

1. WAP to print even numbers between 1 to 100 and also print how many numbers are there.

```
#include<iostream.h>
main()
{
int i, count=0;
cout<<"The Even numbers are";
for(i=0; i<100; i= i + 2)
{
cout<< i <<"\t";
count++;
}
cout<<"The number of even numbers between 1 to 100 are"<<count;
}
```

**2. WAP to print the factorial of a given number.**

```
#include<iostream.h>
main()
{
int n,f=1;
cout<<"Enter any integer number";
cin>>n;
while (n>0)
{
f = f * n;
n--;
}
cout<<"The factorial of given number"<<f;
}
```

**3. WAP to check whether a given number is prime.**

```
#include<iostream.h>
main()
{
int n,i=2,c=0;
cout<<"Enter any integer number";
cin>>n;
while(i<n/2)
{
if(n%i == 0)
c=c+1;
i = i+1;
}
if(c==0) cout<<"The given number is prime";
else
cout<<"The given number is a not prime";
}
```

4. **WAP to find the sum of digits of a given number (eg: Given number is 4567 the output is 4+5+6+7=22)**

```
#include<iostream.h>
main()
{
int n,s=0;
cout<< "enter any integer value";
cin>> n;
while(n>0)
{
s= s +(n%10);
n = n/10;
}
cout <<s;
}
```

5. **WAP to create a menu for Q:5 of Lab\_exercise 2A with the help of do...while loop.**

1. **Sum**
2. **Division**
3. **Multiplication**
4. **Exit**

**Enter choice (1-4)**

```
#include<iostream.h>
main()
{
int a,b,c;
cout<< "Enter any two numbers";
cin>>a>>b;
cout<<"\n";
do
{
cout<< "1. Sum"<<"\n";
cout<< "2. Division"<<"\n";
cout<< "3. Multiplication"<<"\n";
cout<< "4. Exit"<<"\n";
cin>> c;
if (c == 1) cout<< a+b;
if (c == 2) cout<< a/b;
if (c == 3) cout<< a*b;

}
while (c != 4);
}
```

**6. WAP to print Fibonacci series.**

**0 1 1 2 3 5 8 13 21 34 55**

```
#include<iostream.h>
main()
{
int f=0, s=1, t=0, i =2;
cout << "Fibonacci Numbers are"<<"\n";
cout <<f<<"\n"<<s<<"\n";
while (i <10)
{
t = f + s;
cout<<t<<"\n";
i++;
f = s;
s = t;
}
}
```

**7. WAP using 2 for loops to print the following pattern of asterixes.**

**\*  
\*\*  
\*\*\*  
\*\*\*\*  
\*\*\*\*\***

```
#include<iostream.h>
main()
{
int i,j;
for(i=0; i<= 5; i++)
{
for(j=0; j<=i; j++)
cout << "*";
}
cout << "\n";
}
```

8. WAP in C++ to generate multiplication table of number N until the limit m. where m and N are accepted from keyboard.

For example: if N=5 and m=20, then the output:

5 \* 1 = 5

5 \* 2 = 10

.....

5 \* 20 = 100

```
#include<iostream.h>
main()
{
int m,n,i;
cout<<"Enter which table you want";
cin>>n;
cout<<"\n"<<"Enter upto which number you want";
cin>>m;
for(i=1; i<=m;i++)
cout<<n <<"*"<<i<<"="<<n*i<<"\n";
}
```

### **Lab Exercise-5**

1. Create a one dimensional integer array to accept 10 numbers and display them.

```
#include<iostream.h>
main()
{
int a[10],i;
cout<<"Enter any ten numbers";
for(i=0;i<10;i++)
cin>>a[i];
cout<<"Entered numbers are";
for(i=0;i<10;i++)
cout<<a[i]<<endl;
}
```

2. **Create a one dimensional integer array to accept 10 numbers and find their sum and display.**

```
#include<iostream.h>
main()
{
int a[10],i, s=0;
cout<<"Enter any ten numbers";
for(i=0;i<10;i++)
{
cin>>a[i];
s = s+a[i];
}
cout<<"Sum of entered numbers are";
cout<<s;
}
```

3. **Design an array to accept 50 numbers, sort them in ascending and descending order and display.**

```
#include<iostream.h>
main()
{
int a[10],i,j, t=0;
cout<<"Enter any five numbers";
for(i=0;i<5;i++)
cin>>a[i];
for(i=0;i<5;i++)
for(j=0;j<5;j++)
{
if(a[i]<a[j])
{
t=a[i];
a[i] = a[j];
a[j] = t;
}
}
cout<<"The sorted numbers are ";
for(i=0;i<5;i++)
cout<<a[i]<<endl;

}
```

**OR**

```

#include<iostream.h>
main()
{
int a[10],i,j, t=0;
cout<<"Enter any ten numbers";
for(i=0;i<10;i++)
cin>>a[i];
for(i=0;i<10;i++)
for(j=i+1;j<10;j++)
{
if(a[i]<a[j])
{
t=a[i];
a[i] = a[j];
a[j] = t;
}
}
cout<<"The sorted numbers are ";
for(i=0;i<10;i++)
cout<<a[i]<<endl;
}

```

**4. Write a program in C++ to do the following:**

- (a). Accept a string (character array) and find its length (equivalent of strlen()).**
- (b). Accept a string and reverse print it. (equivalent of strrev()).**
- (c). Accept two strings and concatenate them and display the resultant string. (equivalent of strcat()).**

```

#include<iostream.h>
#include<string.h>
main()
{
char a[80];
int i=0;
cout<<"Enter a string";
cin.get(a,79);           // get upto 79 or newline
cout<<a;
//cout<<strlen(a);
while(a[i] !='\0')
i++;

```

```
cout<<i;  
}
```

```
#include<iostream.h>  
#include<string.h>  
#include<conio.h>  
main()  
{  
clrscr();  
char a[80], b[80];  
int i=0,j = 0;  
cout<<"Enter a string";  
cin.get(a,79);  
while(a[i] !='\0')  
i++;  
j = i+1;  
i=0;  
while(a[i] !='\0')  
{  
b[j] = a[i];  
i++;  
j--;  
}  
for(j=0; j<=i+1;j++)  
cout<<b[j];  
}
```

```
#include<iostream.h>  
#include<string.h>  
#include<conio.h>  
main()  
{  
clrscr();  
char a[80], b[80],c[80];  
int i=0,j = 0;  
cout<<"Enter a string";  
cin.getline(a,79);  
cin.getline(b,79);  
while(a[i] !='\0')  
{
```



```

c[j]=a[i];
i++;
j++;
}
i=0;
while(b[i] !='\0')
{
c[j] = b[i];
j++;
i++;
}
cout<<c;
}

```

**5. Write a program in C++ to count the number of vowels and spaces in a sentence and display the count.**

```

#include<iostream.h>
#include<string.h>
#include<conio.h>
main()
{
clrscr();
char a[80];
int i=0,s = 0,v =0;
cout<<"Enter a string";
cin.getline(a,79);
while(a[i] !='\n')
{
if (a[i] == ' ')
s++;
if(a[i] == 'a' || a[i] == 'e' || a[i] == 'i' || a[i] == 'o' || a[i] == 'u')

```

```
v++;  
i++;  
}  
cout<< s<<endl;  
cout<< v;  
}
```

**6. Use arrays to perform the addition of two 3\*3 matrices.**

```
#include<iostream.h>  
main()  
{  
int a[3][3],b[3][3],c[3][3],i,j,k;  
cout<<"Enter 3 X 3 matix values";  
for(i=0;i<3;i++)  
for(j=0;j<3;j++)  
cin>>a[i][j];  
cout<<"Enter 3 X 3 matix values";  
for(i=0;i<3;i++)  
for(j=0;j<3;j++)  
cin>>b[i][j];  
for(i=0;i<3;i++)  
for(j=0;j<3;j++)  
c[i][j] = a[i][j] + b[i][j];  
for(i=0;i<3;i++)
```

```
{  
for(j=0;j<3;j++)  
cout<<c[i][j]<<"\t";  
cout<<endl;  
}  
}
```

### **Lab Exercise-6**

1. **Use pointers to display the address of a character and an integer variable.**

```
#include<iostream.h>  
main()  
{  
int i,*p;  
char j, *q;  
cout<<"Enter integer value";  
cin>>i;  
cout<<"Enter character value";  
cin>>j;  
p= &i;  
q= &j;  
cout<<p <<endl;  
cout<<q;  
}
```

2. **Write program in C++, to read an integer array, using a pointer.**

```
#include<iostream.h>
main()
{
int a[5],*b[5], i;
for(i=0;i<5;i++)
cin>>a[i];
for(i=0;i<5;i++)
{
b[i]=&a[i];
//cout<<"The address of"<<a[i]<<"is" <<b;
}
for(i=0;i<5;i++)
cout<<"The address of"<<a[i]<<"is" <<b[i];
}
```

3. **Make use of pointers, to perform an addition of 2 numbers, which have been accepted from the user.**

```
#include<iostream.h>
main()
{
int i,j,*pi,*pj;
cout<<"Enter any two numbers";
cin>>i>>j;
pi=&i;
pj=&j;
cout<<"Sum is"<<*pi+*pj;
}
```

4. **Design a program, which uses pointers to perform the following actions, addition, subtraction, multiplication and division of given 2 numbers.**

```
#include<iostream.h>
main()
{
int i,j,*pi,*pj;
cout<<"Enter any two numbers";
```

```

cin>>i>>j;
pi=&i;
pj=&j;
cout<<"Sum is"<<*pi+*pj;
cout<<"Difference is"<<*pi-*pj;
cout<<"Multipliation is"<<*pi * *pj;
cout<<"Division is"<<*pi / *pj;
}

```

5. Write a program to perform the functionality of any one of the following functions, using pointers. (strlen() / strcat() / strrev() ).

```

#include<iostream.h>
#include<string.h>
main()
{
char *string = "Borland International";
cout<< strlen(string);
}
#include<iostream.h>
#include<string.h>
main()
{
char *string[80], s[80] ;
int i = 0;
cin.get(s,70);
while(s[i] != '\0')
{
string[i]= &s[i];
i++;
}
}

```

```
cout<< strlen(*string);  
}
```

### **Lab Exercise-7**

**1. Create a function to add 2 integers. Show function prototype, function call and function definition in your code.**

```
#include<iostream.h>  
  
int add(int,int);  
  
main()  
{  
    int x,y;  
    cout<<"Enter two  values";  
    cin>> x>>y;  
    cout<<" The addition of given nos" <<add(x,y);  
}  
  
int add(int a, int b)  
{
```

```
int c;  
  
c = a+b;  
  
return(c);  
  
}
```

**2. Write a program in C++ to pass integer value to a function and return its factorial.**

```
#include<iostream.h>  
  
int fact(int);  
  
main()  
{  
  
int x,y;  
  
cout<<"Enter a value";  
  
cin>> x;  
  
//y = fact(x);  
  
cout<<" The factorial of a given no" <<fact(x);  
  
}
```

```
int fact(int a)  
{  
  
if (a ==1)  
  
return 1;  
  
else  
  
return(a * fact(a-1));  
  
}
```

**3. Write a program to show difference between call by value and call by reference.**

```
#include<iostream.h>  
  
#include<conio.h>
```

```

void swapv(int, int);

void swapa(int *, int *);

void swapr(int &, int &);

void main()
{
    clrscr();

    int a = 10,b = 20;

    swapv(a,b);    //call by value. No effect in main function values

    cout << a<<b<<endl;

    swapa(&a,&b); //call by address

    cout << a<<b<<endl;

    swapr(a,b);    //call by reference

    cout << a<<b<<endl;

}

void swapv(int i, int j)
{
    int t;

    t = i;

    i = j;

    j = t;

    cout << i << j;

}

void swapa(int *i, int *j)
{
    int t;

    t = *i;

```



```
*i = *j;
```

```
*j = t;
```

```
//cout << *i << *j;
```

```
}
```

```
void swapr(int &i, int &j)
```

```
{
```

```
int t;
```

```
t = i;
```

```
i = j;
```

```
j = t;
```

```
}
```