1.

#include <iostream>

using namespace std;

int decimalToBinary(int x)

{

int a[50];

int i=0,r;

while(x!=0)

{

r = x%2;

a[i] = r;

x=x/2;

i++;

}

cout<<"Binary:\n";

for(int j=i-1;j>=0;j--)

cout<<a[j];

return 0;

}

int main()

{

int x;

cout<<"Enter the Decimal number:\n";

cin>>x;

decimalToBinary(x);

return 0;

}

2.

#include <iostream>

using namespace std;

int binaryToDecimal(int x)

{

int basepower=1;

int total=0;

while (x!=0)

{

total=total+(x%10)\*basepower;

x=x/10;

basepower=basepower\*2;

}

return total;

}

int main()

{

int n;

cout << "Enter binary number:" << endl;

cin>>n;

cout<<"Decimal:"<<binaryToDecimal(n);

return 0;

}

3.

#include <iostream>

#include <ctime>

using namespace std;

int naiveMultiplicationVersion2(int x,int y)

{

if(x%2==0)

{

x=x/2;

y=y<<x;

cout<<"Result:"<<y<<endl;

return y;

}

else if(y%2==0)

{

y=y/2;

x=x<<y;

cout<<"Result:"<<x<<endl;

return x;

}

else

{

if(x>y)

{

x=x/2;

y=y<<x;

cout<<"Result(not perfect):"<<y<<endl;

return y;

}

if(y>x)

{

y=y/2;

x=x<<y;

cout<<"Result(not perfect):"<<x<<endl;

return x;

}

}

}

int naiveMultiplication(int x,int y)

{

int sum=x;

int i;

for(i=1;i<y;i++)

{

sum=sum+x;

}

cout<<"Result:"<<sum<<endl;

}

int main()

{

clock\_t st;

int m,n;

cout<<"Enter the elements you want to multiply:"<<endl;

cin>>m>>n;

st=clock();

naiveMultiplication(m,n);

cout<<"Required time:"<<clock()-st/CLK\_TCK<<" s\n";

naiveMultiplicationVersion2(m,n);

return 0;

}

4.

#include <iostream>

using namespace std;

int naiveMultiplicationVersion2(int x,int y)

{

if(x%2==0)

{

x=x/2;

y=y<<x;

cout<<"Result:"<<y<<endl;

return y;

}

else if(y%2==0)

{

y=y/2;

x=x<<y;

cout<<"Result:"<<x<<endl;

return x;

}

else

{

if(x>y)

{

x=x/2;

y=y<<x;

cout<<"Result(not perfect):"<<y<<endl;

return y;

}

if(y>x)

{

y=y/2;

x=x<<y;

cout<<"Result(not perfect):"<<x<<endl;

return x;

}

}

}

int main()

{

int m,n;

cout << "Enter the numbers you want to multiply:" << endl;

cin>>m>>n;

naiveMultiplicationVersion2(m,n);

return 0;

}

5.

#include <iostream>

#include <ctime>

using namespace std;

int naiveMultiplicationVersion2(int x,int y)

{

if(x%2==0)

{

x=x/2;

y=y<<x;

cout<<"Result:"<<y<<endl;

return y;

}

else if(y%2==0)

{

y=y/2;

x=x<<y;

cout<<"Result:"<<x<<endl;

return x;

}

else

{

if(x>y)

{

x=x/2;

y=y<<x;

cout<<"Result(not perfect):"<<y<<endl;

return y;

}

if(y>x)

{

y=y/2;

x=x<<y;

cout<<"Result(not perfect):"<<x<<endl;

return x;

}

}

}

int naiveMultiplication(int x,int y)

{

int sum=x;

int i;

for(i=1;i<y;i++)

{

sum=sum+x;

}

cout<<"Result:"<<sum<<endl;

}

int main()

{

clock\_t st,end;

clock\_t st1,st2;

int m,n;

cout<<"Enter the elements you want to multiply:"<<endl;

cin>>m>>n;

st=clock();

naiveMultiplication(m,n);

end=clock()-st;

st1=clock();

naiveMultiplicationVersion2(m,n);

st2=clock()-st1;

if(end<st2)

{

cout<<"method 1 is better\n";

}

else if(st2<end)

{

cout<<"method 2 is better\n";

}

return 0;

}

6.

#include <iostream>

using namespace std;

void swapFunction(int x,int y)

{

cout<<"Before swap: "<<endl;

cout<<"X="<<x<<endl;

cout<<"Y="<<y<<endl;

x=x+y;

y=x-y;

x=x-y;

cout<<"After swap:"<<endl;

cout<<"X="<<x<<endl;

cout<<"Y="<<y<<endl;

}

int main()

{

swapFunction(2,3);

return 0;

}

7.

#include <iostream>

using namespace std;

int linearSearch(int \*array,int data)

{

int i;

for(i=0;i<5;i++)

{

if(array[i]==data)

{

return i;

}

}

return -1;

}

int main()

{

int a[5],i,n,result;

cout<<"Enter the contents of the array[array limit=5]:"<<endl;

for(i=0;i<5;i++)

{

cin>>a[i];

}

cout<<"Enter the number you want to find:"<<endl;

cin>>n;

result=linearSearch(a,n);

if(result==-1)

{

cout<<"Data not found\n";

}

else

{

cout<<"Result found in "<<result+1<<" index of the array provided\n";

}

return 0;

}

8.

#include <iostream>

using namespace std;

void swap(int &a,int &b)

{

int temp;

temp=a;

a=b;

b=temp;

}

void selection(int a[],int size)

{

int i,j,min;

for(i=0;i<size-1;i++)

{

min=i;

for(j=i+1;j<size;j++)

{

if(a[j]<a[min])

{

min=j;

}

}

if(min!=i)

{

swap(a[i],a[min]);

}

}

}

int main()

{

int num,i,j,arr[50];

cout << "Enter the maximum size of the array: " << endl;

cin>>num;

cout<<"Start input: "<<endl;

for(i=0;i<num;i++)

{

cin>>arr[i];

}

selection(arr,num);

cout<<"Sorted array: "<<endl;

for(i=0;i<num;i++)

{

cout<<arr[i]<<" ";

}

return 0;

}

9.

#include <iostream>

using namespace std;

void swap(int &a,int &b)

{

int temp;

temp=a;

a=b;

b=temp;

}

void insertion(int a[],int size)

{

int i,key,j;

for(i=1;i<size;i++)

{

key=a[i];

j=i-1;

while(j>=0 && a[j]>key)

{

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

j=j-1;

}

a[j+1]=key;

}

}

int main()

{

int num,i,j,arr[50];

cout << "Enter the maximum size of the array: " << endl;

cin>>num;

cout<<"Start input: "<<endl;

for(i=0;i<num;i++)

{

cin>>arr[i];

}

insertion(arr,num);

cout<<"Sorted array: "<<endl;

for(i=0;i<num;i++)

{

cout<<arr[i]<<" ";

}

return 0;

}

10.

#include <iostream>

using namespace std;

void swap(int &a,int &b)

{

int temp;

temp=a;

a=b;

b=temp;

}

void bubble(int st[],int size)

{

int i,j;

int swaps=0;

for(i=1;i<size;i++)

{

for(j=0;j<=size-i;j++)

{

if(st[j]>st[j+1])

{

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

swaps++;

}

}

if(swaps==0)

break;

swaps=0;

}

}

int main()

{

int num,i,j,arr[50];

cout << "Enter the maximum size of the array: " << endl;

cin>>num;

cout<<"Start input: "<<endl;

for(i=0;i<num;i++)

{

cin>>arr[i];

}

bubble(arr,num);

cout<<"Sorted array: "<<endl;

for(i=0;i<num;i++)

{

cout<<arr[i]<<" ";

}

return 0;

}