15BCE0053 TANAY SAXENA

Q1:

#include <iostream>

using namespace std;

int main()

{

int a[20],i,j,k,n,f;

cin>>n;

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

cin>>a[i];

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

{

f=0;

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

{

if(a[i]==a[j])

{

f=1;

break;

}

}

for(k=i+1;k<n;k++)

{

if(a[i]==a[k])

{

f=1;

break;

}

}

if(f==0)

cout<<a[i];

}

return 0;

}

Q2:

Binary search

#include <iostream>

using namespace std;

int main()

{

int a[20],low=0,high,mid,x,n,i;

cin>>n;

high=n-1;

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

cin>>a[i];

cout<<"enter element to search ";

cin>>x;

while(low<=high)

{

mid=(low+high)/2;

if(x=a[mid])

{

cout<<"found at "<<mid+1;

break;

}

else if(x>a[mid])

low=mid+1;

else

high=mid-1;

}

return 0;

}

Complexity of binary search=O(log n)

Time taken for 10000 elements=4.5 ms

Time taken for 100000 elemaents=6 ms

Now, time taken for 10000000 elements:

4.5 =k1 log2(10000)=k1\*13.287

6=k2log2(100000)=k2\*16.609

Therefore k=(k1+k2)/2

K=(0.346+0.361)/2 = 0.354

Hence

0.354\*log2(10000000)=0.354\* 23.253

= 8.231 milliseconds

Q3

Entropy

#include <iostream>

using namespace std;

int main()

{

int n1,n2,n3;

cout<<"enter two numbers between 0 and 15 :";

cin>>n1>>n2;

n3=n1^n2;

if(n3==0)

cout<<0;

else if(n3==15)

cout<<4;

else if(n3==1 || n3==2 || n3==4 || n3==8 )

cout<<1;

else if(n3==12 || n3==6 || n3==3 || n3==5 || n3==7)

cout<<2;

else if(n3==14 || n3==13 || n3==12 || n3==7 )

cout<<3;

return 0;

}