Data Structures and Algorithms (CS F211) – T4

Prof.N.L.Bhanu Murthy

BITS Pilani
Hyderabad Campus

Problem:
Describe a method for finding both the minimum and maximum of n numbers using fewer than 3n/2 comparisons.

Problem:
Describe a method for finding both the minimum and maximum of n numbers using fewer than 3n/2 comparisons.

Sol:
Sort n/2 pairs. Find min of losers, max of winners.
comparisons: n/2 + n/2 –1 + n/2-1 = 3n/2 –2.

An evil king has a cellar containing N bottles of expensive wine, and his guards have just caught a spy trying to poison the king's wine. Fortunately, the guards caught the spy after he succeeded in poisoning only one bottle of wine. Unfortunately, they don't know which bottle! To make matters worse, the poison the spy used was very deadly; just one drop diluted even a billion to one will still kill someone. Even so, the poison works slowly; it takes a full month for the person to die. The king could assign N of his prisoners to each drink from a different bottle and see who dies, but he has many, many, many more bottles of wine than prisoners. Design a scheme that allows the evil king to determine exactly which one of his wine bottles was poisoned in just one month's time while risking the life of at most log N of his prisoner taste testers.

Let S be a set of n lines such that no two are parallel and no three lines meet in the same point. Find out the number of intersection points.

Give a recursive algorithm to compute the product of two positive integers m and n using only addition.

Give a recursive algorithm to compute the product of two positive integers m and n using only addition.

```
int multiply(int m, int n)
{
        int result;

        if (n == 1)
                result =  m;
        else
                result =  m + multiply(m, n-1);
        return(result);
}
```

Thank You!!