

## Some programs in C - Part 4

### 1) Binomial distribution fitting

#### The C Program

```
#include <stdio.h>
#include <math.h>

double binomial(int, double, int);

int main()
{
    int x, f, n, N = 0;
    double mean = 0, p, px, ef;

    printf("IF X FOLLOWS B(n,p) THEN INSERT n : ");
    scanf("%d",&n);

    printf("\nINSERT OBSERVED FREQUENCY FOR\n");

    for(x=0; x<=n; x++)
    {
        printf("\tX = %d: ", x);
        scanf("%d", &f);
        N += f;
        mean += x*f;
    }

    mean = mean/N;
    p = mean/n;

    printf("\nESTIMATES : N = %d, MEAN = %lf , p = %lf", N, mean, p);

    printf("\n\nX\tP(X)\t\tExpected Frequency\n");
    for(x=0; x<=n; x++)
    {
        px = binomial(n, p, x);
        ef = N*px;
        printf("\n%d\t%lf\t\t%g", x, px, ef);
    }
}
```

```
return 0;
}

double binomial(int n, double p, int x)
{
    int i;
    double ncx = 1;

    if(n < 1 || x < 0 || x > n || p <= 0 || p >= 1) return 0;

    for(i=0; i<x; i++)
    {
        ncx = ncx * (n-i)/(double)(x-i);
    }

    return ncx * pow(p,x) * pow(1-p,n-x);
}
```