

### Assignment

1.State and prove additive property of chi-square distribution.

2.Let  $x_1, x_2, \dots, x_n$  be a random sample from normal population with mean  $\mu$  and variance  $\sigma^2$ , then show that

$\bar{x} \sim N(\mu, \frac{\sigma^2}{n})$  and  $\frac{n\sigma^2}{\sigma^2} = \sum_{i=1}^n (x_i - \bar{x})^2$  is a chi-square variate with  $(n-1)$ d.f. and are independently distributed.

( Link : Hogg, Tanis and Rao; S. C. Gupta and V. K. Kapoor )