

## Tutorial on NLPP , Poisson and Normal Distribution

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1) Use Kuhn Tucker conditions to solve the NLPP

$$\text{Maximise. } z = -7x_1^2 + 2x_2^2 + 12x_1x_2$$

$$\text{Subject to, } 5x_1 + 2x_2 \leq 98$$

$$\text{with } x_1, x_2 \geq 0$$

2) Using the method of Lagrange's multiplier, solve the following NLPP

$$\text{Optimise } z = 5x_1^2 + 6x_2^2$$

$$\text{Subject to, } 5x_1 + x_2 = 7$$

$$\text{with } x_1, x_2 \geq 0$$

3) An Auto hire firm has two Auto which it hires out day by day. The

number of demands for an Auto on each day is distributed as Poisson variate with mean 1.5. Calculate the proportion of days on which neither Auto is used.

4) Find the probability that a random variable having standard normal distribution will take a value between 0.87 and 1.28.

5) If  $X \sim N(25, 5)$  find  $X=c$  such that

$$(i) p(X \leq c) = 0.01 \quad (ii) p(X \leq c) = 0.68 \quad (iii) p(c < X) = 0.23$$