Roll No: 2022MCS120009

Part C:

Given Information

Assumption:

Buses arrival of rate is 2 per hours

In 60 minutes 2 Buses will Arrive

In 30 minutes rate of Bus Arrival is 1

from 6:00AM to 7:30AM total of 90min

$P(x=1) =$

formula

$P(x=k) = \frac{\lambda^k e^{-\lambda}}{k!}$ $(k=2)$

$\frac{30}{2} =$ the

$\left(\frac{30}{2}\right)$

$e = 2.718281828$

$\lambda = \frac{30}{2}$

$\therefore \frac{30}{60} = \frac{1}{15} =$

$\lambda = 2$

$P(x=30) = \frac{2^{30} e^{-2}}{30!}$

$= \frac{145315349}{30!}$

$= 5.147 e^{-25}$

2) Let x_i be the number of sandwiches that the

$$Y = x_1 + x_2 + \dots + x_{64}$$

goal is to find y.

$$P(Y \le y) \ge 0.95$$

$$E x_i = \frac{1}{4}(0) + \frac{1}{2}(1) + \frac{1}{4}(2)$$
$$= 1$$

$$E x_i^2 = \frac{1}{4}(0)^2 + \frac{1}{2}(1)^2 + \frac{1}{4}(2)^2$$
$$= 3/2$$

$$\text{Var}(x_i) = E x_i^2 - (E x_i)^2$$
$$= \frac{3}{2} - 1$$
$$= \frac{1}{2} \rightarrow$$

$$SD = \frac{1}{\sqrt{2}}$$

$$EY = 64 \times 1$$
$$= 64$$

$$\text{Var}(Y) = 64 \times \frac{1}{2}$$
$$= 32$$

$$SD_Y = 4\sqrt{2}$$

we can use CLT to find y

$$P(Y \le y) = P\left(\frac{Y - 64}{4\sqrt{2}} \le \frac{y - 64}{4\sqrt{2}}\right)$$

$$= \phi\left(\frac{y-64}{4\sqrt{2}}\right)$$

$$= \phi\left(\frac{y-64}{4\sqrt{2}}\right) = 0.95 \quad \text{so} \quad \frac{y-64}{4\sqrt{2}} = \phi^{-1}(0.95)$$

$$= 1.6449$$

$$y = 73.5$$

we make 74 sandwiches, we are 95% sure that Dale's shotcup