WEEK 6 : QUESTION 4

$$X \sim N(7, 0.1^2)$$

X : Length of a Jump

(a) $P(X \geq 7.15)$

(b) $P(X \leq 7.15)$

Z scores

$$Z_0 = \frac{x_0 - \mu}{\sigma}$$

$$Z_{7.15} = \frac{7.15 - 7.00}{0.10}$$

$$= \frac{0.15}{0.10} = 1.50$$

$$P(X \geq 7.15) = P(Z \geq 1.50)$$

MB3

MB3 $z_0 = 1.50 = 1.5 + 0.00$

Row Col

	0.00
1.5	0.0668

$P(Z \geq 1.50) = 0.0668$

$\therefore P(X \geq 7.15) = 0.0668$

(B) $P(X \leq 7.15)$

$= 1 - 0.0668$

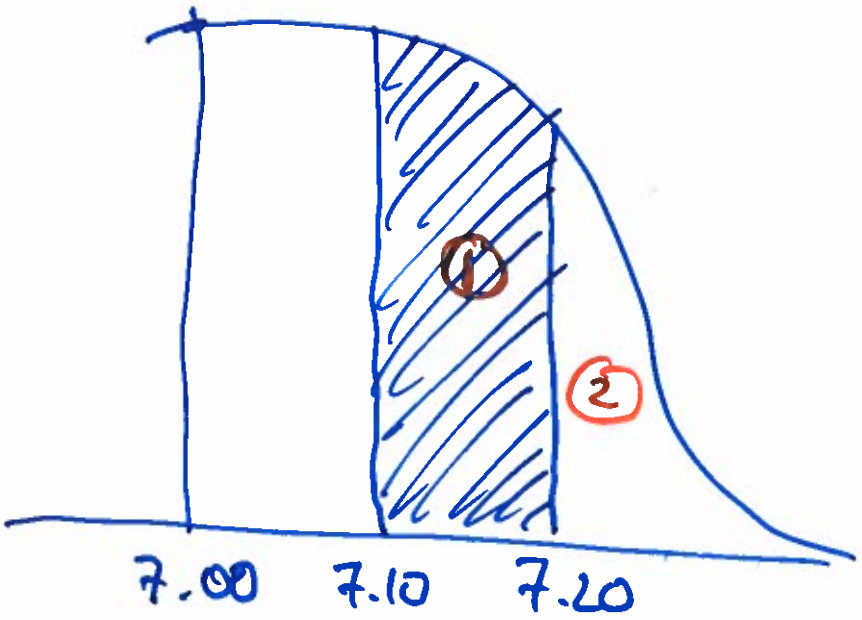
$= 0.9334$

(c) $P(7.10 \leq X \leq 7.20)$

$= 1 - [P(X \leq 7.10) + P(X \geq 7.20)]$

TOO LOW TOO HIGH

DIFFERENT Approach this time



① + ② : $P(X \geq 7.10)$

② : $P(X \geq 7.20)$

What is ① only ?

$P(X \geq 7.10) - P(X \geq 7.20)$.

Z scores : 1.00 and 2.00

$$P(7.10 \leq x \leq 7.20)$$

$$= P(X \geq 7.10) - P(X \geq 7.20)$$

$$= P(Z \geq 1.00) - P(Z \geq 2.00)$$

$$= 0.1587 - 0.02275$$

$$= 0.1360 \text{ approx}$$

REMARK

$$P(X \leq 710)$$

$$= P(Z \leq 1.00)$$

$$= 1 - P(Z \geq 1.00)$$

$$= 1 - 0.1587$$

$$= 0.8413.$$

(d)

Three Jumps less than 7.15

Assume each jump is AN independent Event

$P(X \leq 7.15) = 0.9334$

From before.

$P[3 \text{ Jumps} \leq 7.15] = 0.9334^3$