

STAT100 Elementary Statistics and Probability Summer II 2014

Quiz 5, Wednesday, July 30, 2014

Group Work

Group Members

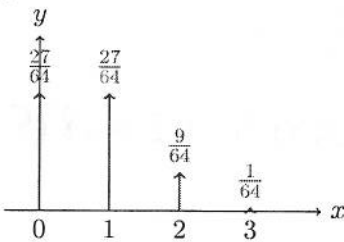
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For each distribution given below, find the following quantities:

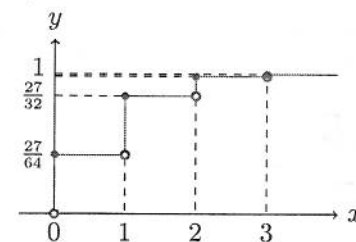
(a). Median, (b). Q_1 , (c). $P(0 \leq X \leq 1)$, (d). Skewness (left, right or symmetric)..

1. Binomial distribution: Binom(3, 1/4).

pmf



cdf



$$\text{Median} = 1$$

$$Q_1 = 0$$

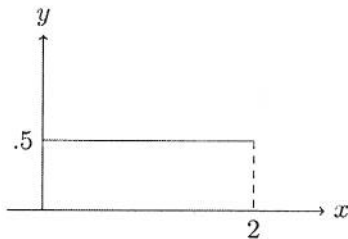
$$P(0 \leq X \leq 1) = \frac{27}{64} + \frac{27}{64} = \frac{27}{32}$$

Right-skewed

2. Uniform distribution: Unif(0,2).

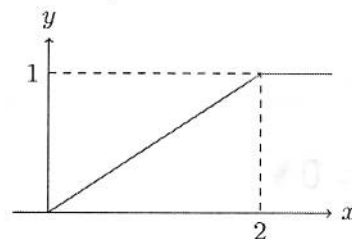
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$$f(x) = \begin{cases} 1/2 & 0 \leq x \leq 2 \\ 0 & \text{otherwise} \end{cases}$$



cdf

$$F(x) = \begin{cases} 0 & x < 0 \\ x/2 & 0 \leq x \leq 2 \\ 1 & x > 2 \end{cases}$$



$$\text{Median} = 1$$

$$Q_1 = .5$$

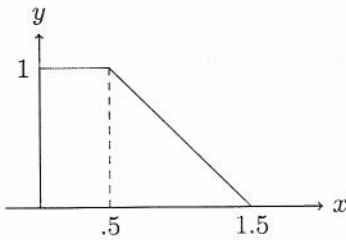
$$P(0 \leq X \leq 1) = F(1) - F(0) = .5 - 0 = .5$$

Symmetric

3. Strange shaped.

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$$f(x) = \begin{cases} 1 & 0 \leq x \leq .5 \\ 1.5 - x & .5 < x \leq 1.5 \\ 0 & \text{otherwise} \end{cases}$$



Median = .5

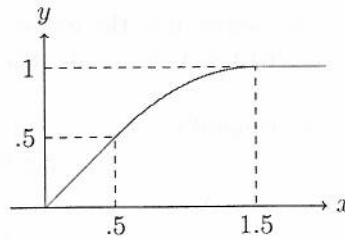
$Q_1 = .25$

$P(0 \leq X \leq 1) = F(1) - F(0) = .875 - 0 = .875$

Right-skewed

cdf

$$F(x) = \begin{cases} 0 & x < 0 \\ x & 0 \leq x < .5 \\ -.5x^2 + 1.5x - .125 & .5 \leq x < 1.5 \\ 1 & x \geq 1.5 \end{cases}$$

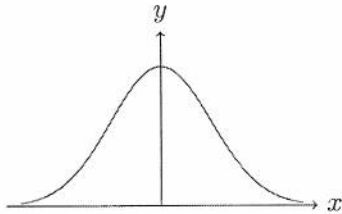


$F(1) = -.5 + 1.5 - .125 = .875$

4. Normal distribution: $N(0, 1)$.

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$$f(x) = \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}x^2}$$



Median = 0

$Q_1 \approx -.67$

$P(0 \leq X \leq 1) = F(1) - F(0) \approx .8413 - .5 = .3413$

Symmetric.

cdf

$f(x) = \Phi(x)$, see table 3 in page 634 of the textbook.

