



UNIVERSIDAD MARIANO GALVEZ DE GUATEMALA

EXTENSIÓN JALAPA

INGENIERÍA EN SISTEMAS Y CIENCIAS DE LA COMPUTACIÓN

ESTADÍSTICA II

Nombre: Esvin Giovanni Gonzlez de la Cruz

Carné: 0907-22-12653

Resuelve cada uno de los ejercicios

1. Se lanza una moneda 3 veces. Calcular la variable aleatoria de que caiga escudo, su distribución de probabilidad, media, varianza y desviación estándar.

The handwritten solution on grid paper shows the following steps:

| X | 0 | 1 | 2 | 3 |
|------|-----|-----|-----|-----|
| f(x) | 1/8 | 3/8 | 3/8 | 1/8 |

$M \leq x f(x)$

$M (0 \times \frac{1}{8}) + (1 \times \frac{3}{8}) + (2 \times \frac{3}{8}) + (3 \times \frac{1}{8})$

$M = 0 + \frac{3}{8} + \frac{3}{4} + \frac{3}{8} = 1.5$

$E(x^2) (0^2 \times \frac{1}{8}) + (1^2 \times \frac{3}{8}) + (2^2 \times \frac{3}{8}) + (3^2 \times \frac{1}{8}) - (1.5^2) = \frac{21}{8} - \frac{9}{4} = 0.75$

| S | X |
|-----|---|
| LLL | 0 |
| LLE | 1 |
| LEL | 1 |
| LEE | 2 |
| ELL | 1 |
| ELE | 2 |
| EEL | 2 |
| EEE | 3 |

2. De una urna que contiene 3 pelotas blancas, dos rojas y 5 amarillas, se sacan dos sin reemplazo. Calcular la variable aleatoria en base a las pelotas rojas, su distribución de probabilidad, media y varianza.

$$P(0) = \frac{\binom{8}{2}}{\binom{10}{2}} = \frac{28}{45} \approx 0.622$$
$$P(1) = \frac{\binom{3}{1} \binom{8}{1}}{\binom{10}{2}} = \frac{16}{45} \approx 0.356$$
$$P(2) = \frac{\binom{2}{2}}{\binom{10}{2}} = \frac{1}{45} = 0.022$$

| x | 0 | 1 | 2 |
|------|-------|-------|-------|
| f(x) | 0.622 | 0.356 | 0.022 |

$$M = (0 \times 0.622) + (1 \times 0.356) + (2 \times 0.022) = 0.4$$
$$E(x^2) = (0^2 \times 0.622) + (1^2 \times 0.356) + (2^2 \times 0.022) = 0.328$$

3. De la siguiente tabla calcule la media y varianza.

| | | | | | | |
|------|------|------|-----|------|------|-----|
| X | 0 | 1 | 2 | 3 | 4 | 5 |
| F(x) | 0.05 | 0.05 | 0.2 | 0.25 | 0.25 | 0.2 |

Handwritten calculations on grid paper:

Table:

| | | | | | | |
|------|------|------|-----|------|------|-----|
| x | 0 | 1 | 2 | 3 | 4 | 5 |
| f(x) | 0.05 | 0.05 | 0.2 | 0.25 | 0.25 | 0.2 |

Mean calculation:

$$M = (0 \times 0.05) + (1 \times 0.05) + (2 \times 0.2) + (3 \times 0.25) + (4 \times 0.25) + (5 \times 0.2)$$
$$M = 0 + 0.05 + 0.4 + 0.75 + 1 + 1$$
$$M = 3.2$$

Second moment calculation:

$$E(x^2) = (0 \times 0.05) + (1 \times 0.05) + (4 \times 0.2) + (9 \times 0.25) + (16 \times 0.25) + (25 \times 0.2)$$
$$E(x^2) = 0 + 0.05 + 0.8 + 2.25 + 4 + 5 = 12.1$$

Variance calculation:

$$\sigma^2 = 12.1 - (3.2)^2 = 1.86$$

4. De la siguiente tabla basados en $g(x) = x^2 + 2$ calcule la media y desviación estándar.

| | | | | |
|------|-----|-----|-----|-----|
| X | 3 | 6 | 9 | 12 |
| F(x) | 0.3 | 0.4 | 0.2 | 0.1 |

| | | | | | |
|--|-----|-----|-----|-----|------------------|
| X | 3 | 6 | 9 | 12 | |
| f(x) | 0.3 | 0.4 | 0.2 | 0.1 | $g(x) = x^2 + 2$ |
| g(x) | 11 | 38 | 83 | 146 | |
| $M = (3 \times 0.3) + (6 \times 0.4) + (9 \times 0.2) + (12 \times 0.1)$ | | | | | |
| $M = 0.9 + 2.4 + 1.8 + 1.2 = 6.3$ | | | | | |

5. Calcule la media de los siguientes valores:

| | | | |
|------|------|------|-----|
| X | -2 | 0 | 2 |
| F(x) | 0.35 | 0.25 | 0.4 |

| | | | | | |
|---|--|--|--|--|--|
| $M = (-2 \times 0.35) + (0 \times 0.25) + (2 \times 0.4)$ | | | | | |
| $M = -0.7 + 0 + 0.8 = 0.1$ | | | | | |