ML Assignment-1

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1 Task-1

$O(n)$

2 Task-2

$def\,factorial(n):$

    if (n==0 or n==1):

        return 1

    else:

        return n*factorial(n-1)

3 Task-3

$O(n^2)$

4 Task-4

$$A = \left[\begin{array}{cc} a & b \\ c & d \end{array} \right]_{2 \times 2}$$

$$B = \left[\begin{array}{c} e \\ f \end{array} \right]_{2 \times 1}$$

$$A * B = \left[\begin{array}{c} ae + bf \\ ce + df \end{array} \right]_{2 \times 1}$$

5 Task-5

5.1 part-a

$f'(x) = 6x + 5$

5.2   part-b

$f'(5) = 6(5) + 5$
$f'(5) = 30 + 5$
$f'(5) = 35$

5.3   part-c

$f''(x) = 6$

5.4   part-d

$f''(5) = 6$

6   Task-6

6.1   a

$\frac{\delta f(x,y)}{\delta x} = 6xy + 5$

6.2   b

x = 5 and y = 2
$= 6(5)(2) + 5$
$= 60 + 5$
$= 65$

7   Task-7

P(A) = 0.3 and P(B) = 0.6

7.1   a

Event is Independent
$P(A and B) = P(A) * P(B)$
$= 0.3 * 0.6$
$= 0.18$

7.2

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$
$= 0.3 + 0.6 - 0.18$
$= 0.72$

7.3   c

$P(Not(A)) = 1 - P(A)$
$= 1 - 0.3 = 0.7$

7.4   d

$P(A|B) = \frac{P(A \cap B)}{P(B)}$

$= \frac{0.18}{0.6}$

$= 0.3$

8   Task-8

8.1   part-a

$P(price < \$75) = \frac{P(price < \$75)}{P(Total)}$

$= \frac{255}{400}$

$= 0.6375$

8.2   part-b

$P(price < \$75 | color = green) = \frac{P(price < \$75 \cap color = green)}{P(color = green)}$

$= \frac{\frac{65}{400}}{\frac{95}{400}}$

$= \frac{65}{95}$

$= 0.6842$

8.3   part-c

$P(price < \$75, color = green)$

$= \frac{P(price < \$75 \cap color = green)}{P(Total)}$

$= \frac{65}{400}$

$= 0.1625$

9 Task-9

rate of egg production $= \frac{2eggs}{2hens*2days}$
$so\ in\ 10\ days,$
$= 10 * 10 * \frac{1}{2}$
$= 100 * \frac{1}{2}$
$= 50\ eggs$

10 Task-10

Included in the zip file

11 Task-11

Included in the zip file

12 Task-12

12.1 part-a

$Option - C$

12.2 part-b

$Option - C$

13 Task-13

$Option - C$