MLG 381 ASSIGNMENT 2

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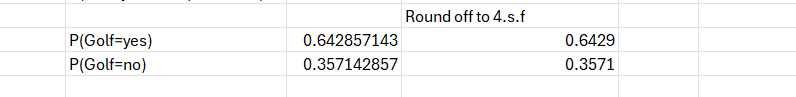
Lecturer name : Matildah M.Chiruka

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# Question 1

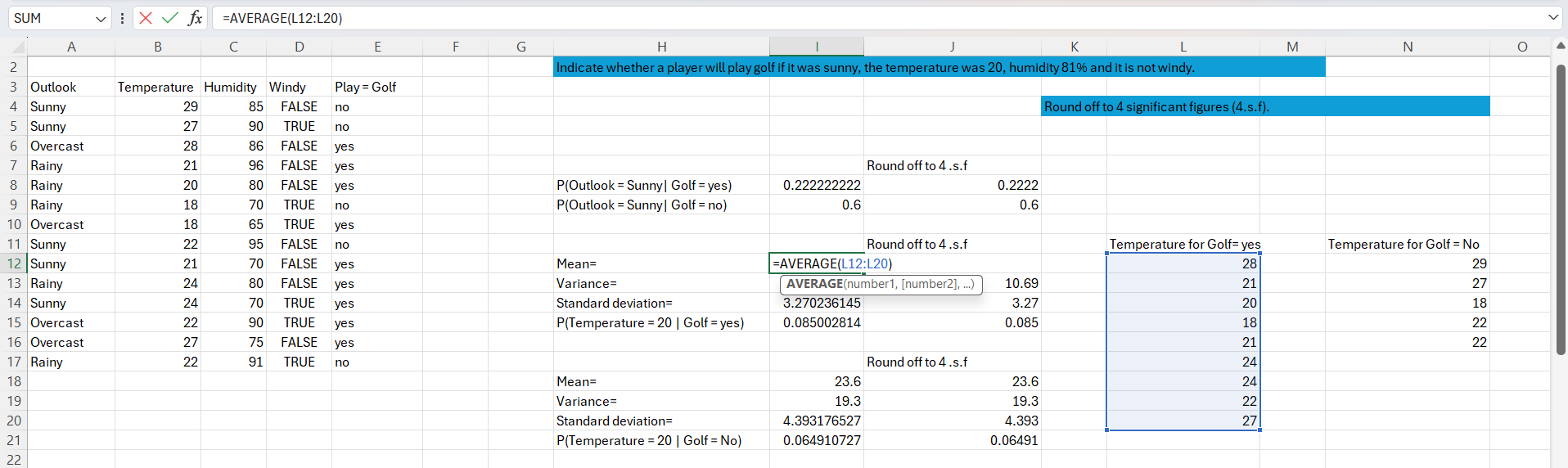


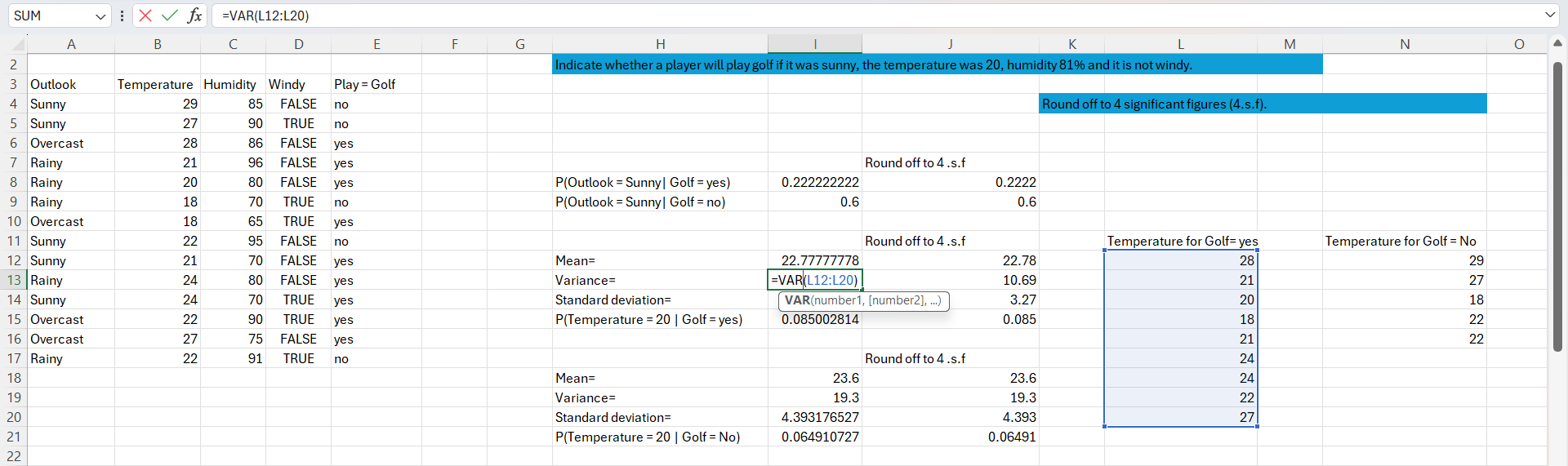
A close up of numbers

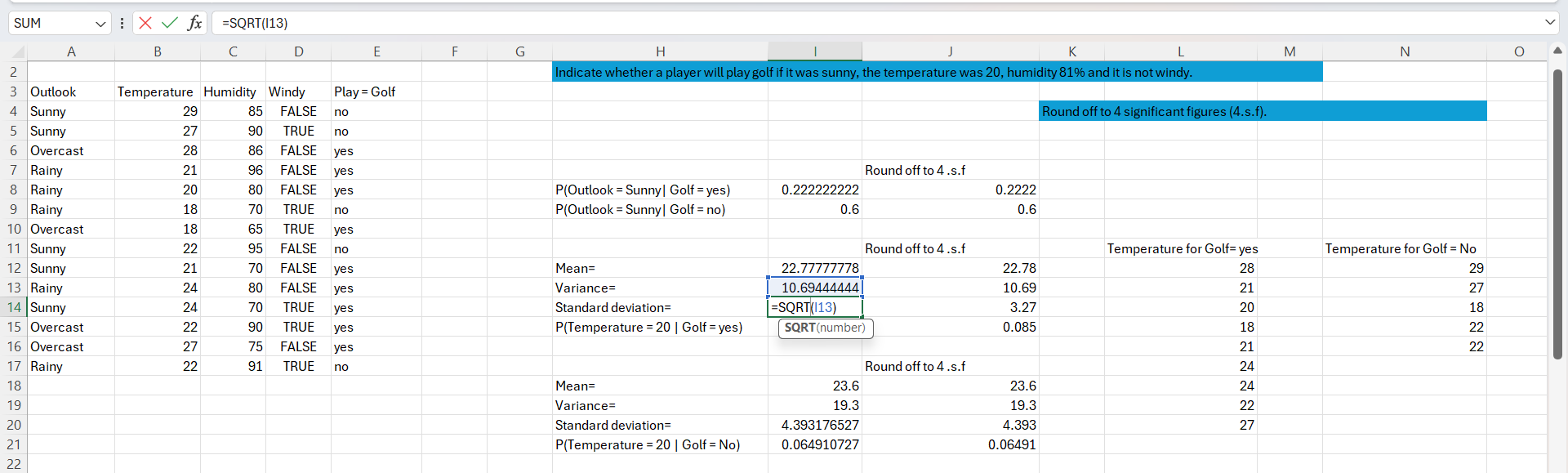
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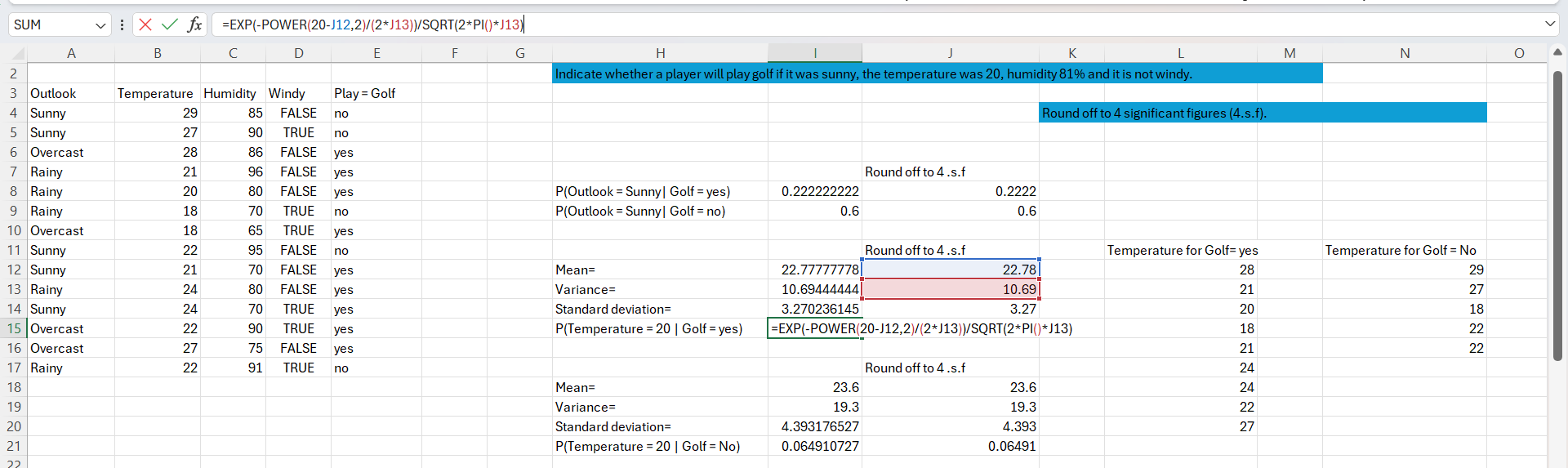
A screenshot of a computer

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A screenshot of a computer

Description automatically generated

# Question 2

1. Weight Vector:

𝑤 = 𝑎 (s1 – s2)

= 𝑎 [(9;5) – (7;2)]

= 𝑎 (2;3)

= 2𝑎; 3𝑎

1. Hyperplane Equation:

Using the weight Vector Points

( ) \* ( ) +w0 = 1

( ) \* ( ) +w0 = -1

( ) \* ( ) +w0 = 1

( ) \* ( ) +w0 = -1

Solve Simultaneously

18𝑎 + 15𝑎 + w0 = 1

14𝑎 + 6𝑎 + w0 = -1

33𝑎 + w0 = 1

20𝑎 +w0 = -1

Substitute for omega

w0 = 1 - 33𝑎

20𝑎 + 1 - 33𝑎 = -1

13𝑎 = 2

𝑎 =

w0 = 1 – 33 ( )

w0 = 1 –

w0 =

Using the weight Vector Points

𝑔(𝑥⃗ ) = ( ) \* ( ) +w0

𝑔(𝑥⃗ ) = ()x1 + ()x2 – ()

𝑔(𝑥⃗ ) = ()x1 + ()x2 – ()

𝑔(𝑥⃗ ) = 4x1 + 6x2 – 53

𝑔(𝑥⃗ ) = ()x1 + ()x2 – ()

𝑔(𝑥⃗ ) = 2x1 + 3x2 – 26.5

∴ 𝑔(𝑥⃗ ) = 4x1 + 6x2 – 53 or 𝑔(𝑥⃗ ) = 2x1 + 3x2 – 26.5