# Question 1

A screenshot of a computer program

Description automatically generated# wind conditions based on current speed as Calm, Moderate or strong

The function of wind condition uses the argument of speed, to represent the wind speed in km/h. Determined by this value it returns a string based on whether its "Calm" less than 5km/h, "Moderate" between 5 and 20 km/h, and "Strong" above 20 km/h

## How to make code reusable

There are multiple ways in which a function can allow for your code to be reusable.

Firstly functions allow for you to be able to call upon them later with no need to rewrite the code. Due to the nature of being separated from the rest of the code, it allows for the code to be more concise and clean, as well as being easier to trace any bugs or issues with the code. Because these functions can be considered as modular, you can reuse these functions in other programs. By changing out the parameters of function you can adapt the code for various other situations without needed to write an entirely new block of code.

# A graph with blue lines Description automatically generatedA screen shot of a computer program Description automatically generatedQuestion 2

A pie chart with different colored sections

Description automatically generated

## Pie Chart

The pie chart shows us a distribution of days it was not raining, lightly raining, and raining heavily as a percentage. We can see that no rain consists of 70% of the days within the first month. Light rain consists of 6.7% of the days within the first month. Heavy rain consists of 23.3% of the days in the first month.

This means that although for the most part it was not raining there was days in which it was raining and those days consisted of mostly heavy rain.

## Bar Graph

The bar graph shows us the daily amounts of rain per day in mm. Through this we can see how and when rainfall occurs to understand a trend. We can see that 6 of the 9 days that were raining occured within the first half of the month. By looking at the overall trend we can see that it looks similar to an inverted bell curve with high instances of rain on either side of the middle.

# A screenshot of a computer Description automatically generatedA computer screen shot of text Description automatically generatedQuestion 3

# A computer code on a black background Description automatically generatedQuestion 4

## A screen shot of a computer Description automatically generatedResults

## Exception Scenario

The way in which I handled the exception scenario is by having a try except block. Therefore, by raising a ValueError when the temperature is below 0 it exits the loop and stops monitoring hourly values

# A screen shot of a computer program Description automatically generatedQuestion 5

## Outputted Data

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Description automatically generated

# Question 6

## **Step 1:**

Write a program that calculates perceived temperature using a heat index which is calculated through the variables temperature and humidity as well as 4 constants.

The formula for the heat index is: HI = C\_1 + C\_2T + C\_3H + C\_4TH

HI = Heat Index (in degrees Celsius)

T = Temperature (in degrees Celsius)

H = Relative Humidity (as a percentage)

Constants: [c\_1 = -8.78469475556, c\_2 = 1.61139411, c\_3 = 2.33854883889, c\_4 = -0.14611605]

## Step 2:

Inputs:

Temperature, T (in degrees Celsius  
  
Humidity, H (as a percentage)

Outputs:

Heat Index, HI (in degrees Celsius)

## Step 3:

Step 3: Using the values of T = 30 degrees, and H = 70% The constants being: c\_1 = -8.78469475556, c\_2 = 1.61139411, c\_3 = 2.33854883889, c\_4 = -0.14611605

we can substitute the values into the formula

HI = c\_1+(c\_2*T)+(c\_3*H)+(c\_4*T*H)

Therefore HI = (-8.78469475556)+((1.61139411)*(30))+((2.33854883889)*(0.7))+((-0.14611605)*(30)*(0.7))

Simplify HI = -8.78469475556 + 48.3418233 + 1.636984187 + -3.06843705

HI = 38.12567568

## Step 4:

Problem: We need to find the heat index given temperature and relative humidity.

This program will request a Temperature (in degrees Celsius) and Humidity (as a %) from the user. The program will then calculate the Heat Index and print to screen.

Define Constants:

set C\_1 = -8.78469475556

set C\_2 = 1.61139411

set C\_3 = 2.33854883889

set C\_4 = -0.14611605

Get input data: Request for the user to input temperature data in degrees Celsius.

Request for the user to input humidity data in percentage points.

Convert humidity into a decimal:

Divide humidity by 100 to convert to a decimal.

Calculate heat index:

Use the following formula

HI = C\_1 + C\_2T + C\_3H + C\_4TH

Output the resulting data: Display the calculated HI as apparent heat in degrees Celsius