

Tutorial 2 Memo

STSM2634

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Q1. Assume the dataset is a vector of daily temperatures in Celsius for a month, provided in the following format:

Temp: 13.01, 11.05, 35.38, 28.61, 0.64, 18.31, 2.65, 0.98, 23.31, 17.76, 33.92, 4.42, 6.81, 12.76, 22.24, 78.08, 16.89, 13.51, 32.80, 5.56, 20.93, 0.86, 17.25, 36.23, 11.55, 25.54, 1.50, 4.77, 6.89, 21.62.

Calculate the Average Temperature:

Use a while() loop to sum all the temperatures in the dataset. Divide the total by the number of days to find the average temperature for the month.

Count Days Above Average Temperature:

Using a for() loop, count the number of days where the temperature was above the calculated average.

Find the Maximum Temperature Swing:

Using a repeat() loop, calculate the temperature swing (absolute difference) between each day and the previous day. Keep track of the maximum swing observed throughout the month.

Ans.

```
# Sample dataset of daily temperatures for a month
temperatures <- c(13.01, 11.05, 35.38, 28.61, 0.64, 18.31, 2.65, 0.98,
23.31, 17.76, 33.92, 4.42, 6.81, 12.76, 22.24, 78.08, 16.89, 13.51, 32.80,
5.56, 20.93, 0.86, 17.25, 36.23, 11.55, 25.54, 1.50, 4.77, 6.89, 21.62)

# Calculate the average temperature
totalTemperature <- 0
i = 1
while(i <= length(temperatures)){
  totalTemperature = totalTemperature+temperatures[i]
  i = i+1
}

averageTemperature <- totalTemperature / length(temperatures)

# To check if the while() loop is giving the correct answer.
mean(temperatures)
```

```
## [1] 17.52767

# Count the number of days above average temperature
daysAboveAverage <- 0
for (temp in temperatures) {
  if (temp > averageTemperature) {
    daysAboveAverage <- daysAboveAverage + 1
  }
}

# Keep track of the maximum temperature swing between any two consecutive
days
# This means when the maximum swing on any day overtakes the previous maximum
swing, we store the swing value. Else, we continue with the previous maximum
swing.

i = 1
maxSwing <- 0
swing <- 0

repeat{
  swing <- abs(temperatures[i+1]-temperatures[i])
  if(i == 1 && swing>maxSwing[i]){
    maxSwing[i] <- swing
  }else{
    if(swing>maxSwing[i-1]){
      maxSwing[i] <- swing
    }else{
      maxSwing[i] <- maxSwing[i-1]
    }
  }
  i <- i+1
  if(i== length(temperatures)){
    break;
  }
}

# Print the results
cat("Average temperature for the month:", averageTemperature, "\n")

## Average temperature for the month: 17.52767

cat("Number of days above average temperature:", daysAboveAverage, "\n")

## Number of days above average temperature: 13

cat("Maximum temperature swing between any two consecutive days:", maxSwing,
"\n")
```

```
## Maximum temperature swing between any two consecutive days: 1.96 24.33
24.33 27.97 27.97 27.97 27.97 27.97 27.97 27.97 29.5 29.5 29.5 29.5 55.84
61.19 61.19 61.19 61.19 61.19 61.19 61.19 61.19 61.19 61.19 61.19 61.19
61.19
```

