LAB ACTIVITY 14

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TASK-2: Handling EXCEL

1. Read from an EXCEL file

In [56]:
```
import pandas as pd

#Read the Excel file into a DataFrame
df = pd.read_excel('Call Test Measure.xlsx', sheet_name = "Sheet1") #Use the read_excel() function to import yo
```

In [5]:
```
print(df.head()) # Displays first 5 rows
```

```
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-07-01 00:00:27         -61.0    68.800003                 1048.60
1 2017-07-01 00:02:57         -61.0    68.769997                 1855.54
2 2017-07-01 00:05:29         -71.0    69.169998                 1685.62
3 2017-07-01 00:08:02         -65.0    69.279999                 1770.92
4 2017-07-01 00:10:30        -103.0     0.820000                  256.07

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                    90.0          SUCCESS                 UMTS
1                    90.0          SUCCESS                 UMTS
2                    90.0          SUCCESS                 UMTS
3                    90.0          SUCCESS                 UMTS
4                    60.0          SUCCESS                 UMTS

   Call Test Setup Time (s)  MOS
0                      0.56  2.1
1                      0.45  3.2
2                      0.51  2.1
3                      0.00  1.0
4                      3.35  3.6
```

In [7]:
```
print(df.describe()) # Displays the statistics
```

```
                        Date Of Test   Signal (dBm)    Speed (m/s)  \
count                         105828  105821.000000  105828.000000
mean   2017-09-01 11:26:42.371858176     -78.653623       8.629296
min              2017-07-01 00:00:27    -140.000000      -1.000000
25%              2017-08-03 11:11:47     -92.000000       0.000000
50%              2017-09-03 18:23:42     -79.000000       0.000000
75%    2017-09-30 07:30:44.750000128     -63.000000       7.770000
max              2017-10-31 23:50:19     -51.000000      86.310516
std                              NaN      18.631699      18.008427

       Distance from site (m)  Call Test Duration (s)  \
count            95469.000000           105828.000000
mean              7797.172461               84.202264
min                  1.410000               12.900000
25%                236.580000               60.000000
50%                430.350000               90.000000
75%                789.960000               90.000000
max             745483.680000              900.000000
std              49584.213355               66.250741

       Call Test Setup Time (s)            MOS
count             105828.000000  105828.000000
mean                   2.662776       3.105864
min                    0.000000       1.000000
25%                    0.640000       2.100000
50%                    3.510000       3.100000
75%                    4.080000       4.400000
max                   45.330000       4.400000
std                    2.057087       1.252348
```

In [9]:
```
print(df.shape) # Displays the rows and columns
```

```
(105828, 9)
```

In [11]:
```
print(df.info()) # Statistical Information about Excel file
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 105828 entries, 0 to 105827
Data columns (total 9 columns):
 #   Column                   Non-Null Count   Dtype
---  ------                   --------------   -----
 0   Date Of Test             105828 non-null  datetime64[ns]
 1   Signal (dBm)             105821 non-null  float64
 2   Speed (m/s)              105828 non-null  float64
 3   Distance from site (m)   95469 non-null   float64
 4   Call Test Duration (s)   105828 non-null  float64
 5   Call Test Result         105828 non-null  object
 6   Call Test Technology     105828 non-null  object
 7   Call Test Setup Time (s) 105828 non-null  float64
 8   MOS                      105828 non-null  float64
dtypes: datetime64[ns](1), float64(6), object(2)
memory usage: 7.3+ MB
None
```

2.Extract the contents

In [20]:
```
# Extract the Success call test result from Call Test Measure.xlsx
call_test_df = df[df['Call Test Result'] == 'SUCCESS']
print("Calls Test Results:\n", call_test_df)
```

```
Calls Test Results:
               Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0      2017-07-01 00:00:27         -61.0    68.800003                 1048.60
1      2017-07-01 00:02:57         -61.0    68.769997                 1855.54
2      2017-07-01 00:05:29         -71.0    69.169998                 1685.62
3      2017-07-01 00:08:02         -65.0    69.279999                 1770.92
4      2017-07-01 00:10:30        -103.0     0.820000                  256.07
...                    ...           ...          ...                     ...
105823 2017-10-31 23:34:11        -114.0    -1.000000                 1149.34
105824 2017-10-31 23:38:56        -111.0    -1.000000                 1177.42
105825 2017-10-31 23:43:47        -111.0     0.800000                 1159.05
105826 2017-10-31 23:48:33        -111.0    -1.000000                 1153.14
105827 2017-10-31 23:50:19        -111.0    -1.000000                 1153.14

        Call Test Duration (s) Call Test Result Call Test Technology  \
0                         90.0          SUCCESS                 UMTS
1                         90.0          SUCCESS                 UMTS
2                         90.0          SUCCESS                 UMTS
3                         90.0          SUCCESS                 UMTS
4                         60.0          SUCCESS                 UMTS
...                        ...              ...                  ...
105823                    90.0          SUCCESS                  LTE
105824                    90.0          SUCCESS                  LTE
105825                    90.0          SUCCESS                  LTE
105826                    90.0          SUCCESS                  LTE
105827                    90.0          SUCCESS                  LTE

        Call Test Setup Time (s)  MOS
0                           0.56  2.1
1                           0.45  3.2
2                           0.51  2.1
3                           0.00  1.0
4                           3.35  3.6
...                          ...  ...
105823                      0.53  4.3
105824                      0.84  4.4
105825                      0.43  4.4
105826                      0.52  4.3
105827                      0.80  4.4

[105148 rows x 9 columns]
```

3. Write the output of a Query into an EXCEL File

In [23]:
```
# Write the query results to a new Excel file
output_file = 'call_test.xlsx'
call_test_df.to_excel(output_file, index=False)
```

In [25]:
```
data = pd.read_excel('call_test.xlsx')
```

In [26]:
```
# Display the first 5 rows of Output file extracted from the query
print(data.head())
```

```
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-07-01 00:00:27         -61.0    68.800003                 1048.60
1 2017-07-01 00:02:57         -61.0    68.769997                 1855.54
2 2017-07-01 00:05:29         -71.0    69.169998                 1685.62
3 2017-07-01 00:08:02         -65.0    69.279999                 1770.92
4 2017-07-01 00:10:30        -103.0     0.820000                  256.07

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                    90.0          SUCCESS                 UMTS
1                    90.0          SUCCESS                 UMTS
2                    90.0          SUCCESS                 UMTS
3                    90.0          SUCCESS                 UMTS
4                    60.0          SUCCESS                 UMTS

   Call Test Setup Time (s)  MOS
0                      0.56  2.1
1                      0.45  3.2
2                      0.51  2.1
3                      0.00  1.0
4                      3.35  3.6
```

4. Append to an Excel file

In [31]:
```python
# Create a small DataFrame with new order data to append
new_record = {
    "Date Of Test": "02-07-2017 10:30",
    "Signal (dBm)": -75,
    "Speed (m/s)": 55.2,
    "Distance from site (m)": 850.4,
    "Call Test Duration (s)": 120.0,
    "Call Test Result": "SUCCESS",
    "Call Test Technology": "LTE",
    "Call Test Setup Time (s)": 0.45,
    "MOS": 3.5
}

new_orders_df = pd.DataFrame([new_record])
```

In [35]:
```python
# Define the file path
file_path = 'Call Test Measure.xlsx'

existing_df = pd.read_excel(file_path)

#Concatenate the existing DataFrame and the new DataFrame
combined_df = pd.concat([existing_df, new_orders_df], ignore_index=True)

#Write the combined DataFrame back to the same Excel file, overwriting it
combined_df.to_excel(file_path, index=False)
print(f"Successfully appended new data and updated '{file_path}'.")
```

```
Successfully appended new data and updated 'Call Test Measure.xlsx'.
```

In [37]:
```python
print(pd.read_excel('Call Test Measure.xlsx', sheet_name = 'Sheet1').iloc[105828]) # Display the new record ins
```

```
Date Of Test                02-07-2017 10:30
Signal (dBm)                           -75.0
Speed (m/s)                             55.2
Distance from site (m)                 850.4
Call Test Duration (s)                 120.0
Call Test Result                     SUCCESS
Call Test Technology                     LTE
Call Test Setup Time (s)                0.45
MOS                                      3.5
Name: 105828, dtype: object
```

5. Read a Excel Chunk-by-chunk

In [39]:
```python
# File path
file_path = "Call Test Measure.xlsx"

# Get total number of rows (without loading entire file)
total_rows = pd.read_excel(file_path, engine="openpyxl").shape[0]

# Define chunk size
chunk_size = 5000  # number of rows per chunk

# Read in chunks
for start_row in range(0, total_rows, chunk_size):
    # Read a chunk
    chunk = pd.read_excel(
        file_path,
```

```
        engine="openpyxl",
        skiprows=range(1, start_row + 1),  # skip rows except header
        nrows=chunk_size
    )

    print(f"Processing rows {start_row + 1} to {start_row + len(chunk)}...")
    print(chunk.head())
```

```
Processing rows 1 to 5000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-07-01 00:00:27         -61.0    68.800003                 1048.60
1 2017-07-01 00:02:57         -61.0    68.769997                 1855.54
2 2017-07-01 00:05:29         -71.0    69.169998                 1685.62
3 2017-07-01 00:08:02         -65.0    69.279999                 1770.92
4 2017-07-01 00:10:30        -103.0     0.820000                  256.07

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                    90.0          SUCCESS                 UMTS
1                    90.0          SUCCESS                 UMTS
2                    90.0          SUCCESS                 UMTS
3                    90.0          SUCCESS                 UMTS
4                    60.0          SUCCESS                 UMTS

   Call Test Setup Time (s)  MOS
0                      0.56  2.1
1                      0.45  3.2
2                      0.51  2.1
3                      0.00  1.0
4                      3.35  3.6
Processing rows 5001 to 10000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-07-10 05:57:34          -114          0.0                  400.43
1 2017-07-10 06:00:07          -114          0.0                  405.54
2 2017-07-10 06:02:39          -114          0.0                  397.18
3 2017-07-10 06:05:12          -114          0.6                  379.87
4 2017-07-10 06:07:44          -114          0.6                  379.87

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                    90.0          SUCCESS                  LTE
1                    90.0          SUCCESS                  LTE
2                    90.0          SUCCESS                  LTE
3                    90.0          SUCCESS                  LTE
4                    90.0          SUCCESS                  LTE

   Call Test Setup Time (s)  MOS
0                      0.54  4.3
1                      0.48  4.3
2                      0.54  4.3
3                      0.69  4.3
4                      0.52  4.3
Processing rows 10001 to 15000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-07-14 22:34:48         -90.0         0.00                  242.93
1 2017-07-14 22:36:25        -103.0         0.00                  532.08
2 2017-07-14 22:37:20         -90.0         0.00                  242.93
3 2017-07-14 22:38:57         -92.0         7.14                   62.33
4 2017-07-14 22:39:52         -90.0         0.00                  242.94

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                    90.0          SUCCESS                  LTE
1                    90.0          SUCCESS                  LTE
2                    90.0          SUCCESS                  LTE
3                    90.0          SUCCESS                  LTE
4                    90.0          SUCCESS                  LTE

   Call Test Setup Time (s)  MOS
0                      0.51  4.4
1                      0.55  4.3
2                      0.59  4.4
3                      0.50  4.3
4                      0.48  4.4
Processing rows 15001 to 20000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-07-20 22:11:51         -71.0    -1.000000                5793.02
1 2017-07-20 22:13:54        -105.0     1.140000                 243.75
2 2017-07-20 22:14:49         -63.0    69.279999                 168.69
3 2017-07-20 22:16:27        -105.0     1.140000                 243.75
4 2017-07-20 22:17:06         -59.0    -1.000000                2915.59

   Call Test Duration (s)     Call Test Result Call Test Technology  \
0                   90.00              SUCCESS                 UMTS
1                   60.00              SUCCESS                 UMTS
2                   90.00              SUCCESS                 UMTS
3                   60.00              SUCCESS                 UMTS
```

```
4                  76.34  FAILURE - DROP CALL                UMTS

   Call Test Setup Time (s)  MOS
0                      0.00  2.9
1                      4.63  3.8
2                      0.00  2.0
3                      3.54  2.4
4                      0.51  4.3
Processing rows 20001 to 25000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-07-26 21:24:30           -77        11.37                     NaN
1 2017-07-26 21:24:50           -86         0.00                  170.26
2 2017-07-26 21:26:15           -73         0.55                  643.63
3 2017-07-26 21:26:47           -85         2.92                  288.77
4 2017-07-26 21:27:06           -86         0.00                  167.77

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                   60.00          SUCCESS                UMTS
1                   59.93          SUCCESS                 LTE
2                   60.00          SUCCESS                UMTS
3                  900.00          SUCCESS                UMTS
4                   60.00          SUCCESS                 LTE

   Call Test Setup Time (s)  MOS
0                      3.81  2.7
1                      0.63  4.3
2                      4.04  2.7
3                      3.79  1.6
4                      0.74  4.4
Processing rows 25001 to 30000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-08-01 13:51:53           -77         6.34                 1018.07
1 2017-08-01 13:52:01           -69         0.00                  414.89
2 2017-08-01 13:55:01           -77         9.32                  377.64
3 2017-08-01 13:56:35           -92         0.00                  234.58
4 2017-08-01 13:58:27           -73         0.00                  112.70

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                    60.0          SUCCESS                 GSM
1                   900.0          SUCCESS                UMTS
2                    60.0          SUCCESS                UMTS
3                    60.0          SUCCESS                 LTE
4                    60.0          SUCCESS                UMTS

   Call Test Setup Time (s)  MOS
0                      3.58  4.4
1                      3.76  2.1
2                      3.81  2.7
3                      1.00  4.3
4                      3.60  2.7
Processing rows 30001 to 35000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-08-08 01:18:04           -79          0.0                  126.23
1 2017-08-08 01:20:26           -81          0.0                  125.99
2 2017-08-08 01:22:49           -79          0.0                  126.09
3 2017-08-08 01:25:10           -81          0.0                  126.20
4 2017-08-08 01:27:31           -77          0.0                  126.19

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                   90.0          SUCCESS                UMTS
1                   90.0          SUCCESS                UMTS
2                   90.0          SUCCESS                UMTS
3                   90.0          SUCCESS                UMTS
4                   90.0          SUCCESS                UMTS

   Call Test Setup Time (s)  MOS
0                      4.09  2.1
1                      4.01  2.1
2                      3.78  2.1
3                      3.99  1.0
4                      5.08  2.1
Processing rows 35001 to 40000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-08-13 16:59:20           -83        13.92                 1066.02
1 2017-08-13 17:01:11           -89         0.00                 1178.43
2 2017-08-13 17:03:34           -91         0.00                 1180.03
3 2017-08-13 17:05:56           -91         0.00                 1180.52
4 2017-08-13 17:08:18           -91         0.00                 1181.48

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                   60.00          SUCCESS                UMTS
1                   89.86          SUCCESS                UMTS
2                   89.81          SUCCESS                UMTS
```

```
3                  89.83          SUCCESS                UMTS
4                  90.00          SUCCESS                UMTS

   Call Test Setup Time (s)  MOS
0                      0.00  2.7
1                      3.82  2.1
2                      3.46  4.4
3                      3.81  2.1
4                      3.69  1.0
Processing rows 40001 to 45000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-08-19 14:13:22           -87        -1.00                  658.25
1 2017-08-19 14:14:32           -75         9.33                 1432.96
2 2017-08-19 14:15:43           -85        -1.00                  667.94
3 2017-08-19 14:17:18           -83         0.78                  134.60
4 2017-08-19 14:18:04           -87        -1.00                  681.29

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                    90.0          SUCCESS                UMTS
1                    60.0          SUCCESS                UMTS
2                    90.0          SUCCESS                UMTS
3                    60.0          SUCCESS                UMTS
4                    90.0          SUCCESS                UMTS

   Call Test Setup Time (s)  MOS
0                      4.42  2.7
1                      4.21  2.7
2                      4.21  1.0
3                      0.00  2.7
4                      3.98  1.0
Processing rows 45001 to 50000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-08-26 11:50:50           -69     1.182709                  231.82
1 2017-08-26 11:53:12           -61     0.000000                  114.06
2 2017-08-26 11:53:51           -81     2.270000                  476.57
3 2017-08-26 11:55:34           -61     0.000000                  112.28
4 2017-08-26 11:56:21           -77     3.450000                   63.14

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                    90.0          SUCCESS                UMTS
1                    90.0          SUCCESS                UMTS
2                    60.0          SUCCESS                UMTS
3                    90.0          SUCCESS                UMTS
4                    60.0          SUCCESS                UMTS

   Call Test Setup Time (s)  MOS
0                      3.94  1.0
1                      3.76  2.7
2                      0.00  2.7
3                      3.30  3.3
4                      0.00  1.0
Processing rows 50001 to 55000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-08-30 19:12:24           -51    11.200005                  275.11
1 2017-08-30 19:12:25           -71     3.470000                   21.28
2 2017-08-30 19:13:18           -63     0.000000                  551.37
3 2017-08-30 19:13:51           -71     0.000000                  102.61
4 2017-08-30 19:14:47           -55     0.000000                  435.66

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                    90.0          SUCCESS                UMTS
1                    60.0          SUCCESS                UMTS
2                    60.0          SUCCESS                UMTS
3                    60.0          SUCCESS                UMTS
4                    90.0          SUCCESS                UMTS

   Call Test Setup Time (s)  MOS
0                      4.08  4.2
1                      2.10  1.0
2                      3.31  1.0
3                      8.76  4.4
4                      4.55  3.4
Processing rows 55001 to 60000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-09-06 09:52:46           -67     6.520000                   27.53
1 2017-09-06 09:52:48           -53    29.358074                17526.55
2 2017-09-06 09:53:49           -67     5.340000                     NaN
3 2017-09-06 09:54:51           -89     7.590000                  295.71
4 2017-09-06 09:54:53           -71     5.880000                  365.43

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                    60.0          SUCCESS                UMTS
1                    90.0          SUCCESS                UMTS
```

```
2                   60.0          SUCCESS                UMTS
3                   60.0          SUCCESS                UMTS
4                   60.0          SUCCESS                UMTS

   Call Test Setup Time (s)  MOS
0                      0.00  2.7
1                      4.24  2.0
2                      4.34  2.7
3                      3.96  3.3
4                      0.00  2.7
Processing rows 60001 to 65000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-09-12 11:22:27          -107          0.0                  282.24
1 2017-09-12 11:23:14           -85          0.0                  741.43
2 2017-09-12 11:24:43          -107          0.0                  282.65
3 2017-09-12 11:25:35           -85          0.0                  741.74
4 2017-09-12 11:26:58          -107          0.0                  282.51

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                    60.0          SUCCESS                 LTE
1                    90.0          SUCCESS                UMTS
2                    60.0          SUCCESS                 LTE
3                    90.0          SUCCESS                UMTS
4                    60.0          SUCCESS                 LTE

   Call Test Setup Time (s)  MOS
0                      0.68  4.3
1                      3.66  2.1
2                      0.86  4.3
3                      5.24  4.4
4                      0.77  4.3
Processing rows 65001 to 70000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-09-15 18:27:40           -79         -1.0               241397.58
1 2017-09-15 18:29:14           -65          0.0                  424.43
2 2017-09-15 18:30:10           -84         -1.0               241397.58
3 2017-09-15 18:31:36           -65          0.0                  424.45
4 2017-09-15 18:32:41           -83         -1.0               241397.58

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                   90.00          SUCCESS                 LTE
1                   90.00          SUCCESS                UMTS
2                   90.00          SUCCESS                 LTE
3                   89.88          SUCCESS                UMTS
4                   90.00          SUCCESS                 LTE

   Call Test Setup Time (s)  MOS
0                      0.40  4.4
1                      3.50  4.4
2                      0.51  4.4
3                      3.22  2.7
4                      0.79  4.4
Processing rows 70001 to 75000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-09-19 08:44:58          -102     9.020000                 3592.35
1 2017-09-19 08:45:00           -77     0.000000                 1073.72
2 2017-09-19 08:45:07           -75    47.340107                     NaN
3 2017-09-19 08:46:36           -75     0.000000                 1074.20
4 2017-09-19 08:47:18           -93     6.860000                  676.84

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                    90.0          SUCCESS                 LTE
1                    60.0          SUCCESS                UMTS
2                    90.0          SUCCESS                UMTS
3                    60.0          SUCCESS                UMTS
4                    60.0          SUCCESS                UMTS

   Call Test Setup Time (s)  MOS
0                      0.60  4.4
1                      0.00  2.2
2                      9.09  1.0
3                      0.00  1.0
4                      4.03  2.5
Processing rows 75001 to 80000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-09-28 04:35:27          -102          0.0                  322.27
1 2017-09-28 04:36:07           -73          0.0                  496.59
2 2017-09-28 04:38:00          -102          0.0                  320.88
3 2017-09-28 04:38:29           -71          0.0                  496.58
4 2017-09-28 04:40:31          -101          0.0                  320.62

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                    90.0          SUCCESS                 LTE
```

```
1                   90.0          SUCCESS                UMTS
2                   90.0          SUCCESS                 LTE
3                   90.0          SUCCESS                UMTS
4                   90.0          SUCCESS                 LTE

   Call Test Setup Time (s)  MOS
0                      0.93  4.4
1                      3.50  1.0
2                      0.57  4.4
3                      3.72  2.1
4                      1.27  4.4
Processing rows 80001 to 85000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-09-30 16:04:19           -79          0.0                  518.03
1 2017-09-30 16:04:43           -89         -1.0                 5536.40
2 2017-09-30 16:06:41           -79          0.0                  518.20
3 2017-09-30 16:07:13           -81         -1.0                 5536.40
4 2017-09-30 16:07:20           -71         13.5                  261.44

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                   90.0          SUCCESS                UMTS
1                   90.0          SUCCESS                UMTS
2                   90.0          SUCCESS                UMTS
3                   90.0          SUCCESS                UMTS
4                   60.0          SUCCESS                UMTS

   Call Test Setup Time (s)  MOS
0                      4.20  2.1
1                      0.44  2.9
2                      4.23  2.1
3                      0.00  1.8
4                      0.00  4.3
Processing rows 85001 to 90000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-10-04 15:58:54         -51.0     1.310038                  519.76
1 2017-10-04 15:59:31         -51.0    67.809998                38648.53
2 2017-10-04 16:01:15         -51.0     0.190263                  523.74
3 2017-10-04 16:03:37         -51.0     8.630000                  456.77
4 2017-10-04 16:04:17         -51.0    29.680000                  640.54

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                   90.0          SUCCESS                UMTS
1                   90.0          SUCCESS                UMTS
2                   90.0          SUCCESS                UMTS
3                   90.0          SUCCESS                UMTS
4                   90.0          SUCCESS                UMTS

   Call Test Setup Time (s)  MOS
0                      4.61  4.4
1                      0.00  1.0
2                      4.43  3.9
3                      4.04  4.4
4                      0.63  2.1
Processing rows 90001 to 95000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-10-09 05:04:19          -108         -1.0                     NaN
1 2017-10-09 05:06:51          -108         -1.0                     NaN
2 2017-10-09 05:09:22          -108         -1.0                     NaN
3 2017-10-09 05:11:53          -108         -1.0                     NaN
4 2017-10-09 05:14:25          -108         -1.0                     NaN

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                   90.0          SUCCESS                 LTE
1                   90.0          SUCCESS                 LTE
2                   90.0          SUCCESS                 LTE
3                   90.0          SUCCESS                 LTE
4                   90.0          SUCCESS                 LTE

   Call Test Setup Time (s)  MOS
0                      0.83  4.4
1                      0.69  4.4
2                      1.03  4.4
3                      1.09  4.4
4                      0.67  4.4
Processing rows 95001 to 100000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-10-13 19:38:11           -81          0.0                  512.15
1 2017-10-13 19:39:54           -51         -1.0               301678.25
2 2017-10-13 19:40:34           -81          0.0                  512.12
3 2017-10-13 19:42:25           -51         -1.0               301678.25
4 2017-10-13 19:42:56           -81          0.0                  512.14

   Call Test Duration (s) Call Test Result Call Test Technology  \
```

```
0                    90.0          SUCCESS                 UMTS
1                    90.0          SUCCESS                 UMTS
2                    90.0          SUCCESS                 UMTS
3                    90.0          SUCCESS                 UMTS
4                    90.0          SUCCESS                 UMTS

   Call Test Setup Time (s)  MOS
0                      5.14  2.7
1                      0.00  2.8
2                      4.04  4.4
3                      0.00  3.4
4                      3.66  2.1
Processing rows 100001 to 105000...
         Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0 2017-10-20 17:32:23           -91         -1.0                  566.47
1 2017-10-20 17:34:46           -89         -1.0                  566.47
2 2017-10-20 17:37:08           -91         -1.0                  566.47
3 2017-10-20 17:39:29           -91         -1.0                 1231.97
4 2017-10-20 17:41:50           -77         -1.0                  487.13

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                    90.0          SUCCESS                 UMTS
1                    90.0          SUCCESS                 UMTS
2                    90.0          SUCCESS                 UMTS
3                    90.0          SUCCESS                 UMTS
4                    90.0          SUCCESS                 UMTS

   Call Test Setup Time (s)  MOS
0                      4.54  2.1
1                      4.46  2.1
2                      4.67  1.0
3                      4.88  2.7
4                      4.36  4.2
Processing rows 105001 to 105829...
          Date Of Test  Signal (dBm)  Speed (m/s)  Distance from site (m)  \
0  2017-10-30 22:47:13           -51     1.059292                  234.28
1  2017-10-30 22:49:37           -51    18.520002                  198.93
2  2017-10-30 22:49:57          -110    -1.000000                  759.69
3  2017-10-30 22:52:00           -51    41.260040                  927.24
4  2017-10-30 22:54:22           -57    43.760113                 2306.65

   Call Test Duration (s) Call Test Result Call Test Technology  \
0                    90.0          SUCCESS                 UMTS
1                    90.0          SUCCESS                 UMTS
2                    90.0          SUCCESS                  LTE
3                    90.0          SUCCESS                 UMTS
4                    90.0          SUCCESS                 UMTS

   Call Test Setup Time (s)  MOS
0                      4.69  4.4
1                      4.06  3.8
2                      0.56  4.4
3                      4.79  3.2
4                      5.33  4.4
```

6.Writing numeric data to a new Excel file

In [40]:
```python
# Create numeric data
data = {
    "Product_ID": [101, 102, 103, 104],
    "Quantity_Sold": [20, 35, 15, 50],
    "Price_Per_Unit": [100, 150, 120, 80],
    "Total_Sales": [20*100, 35*150, 15*120, 50*80]  # Calculated column
}

# Convert to DataFrame
df = pd.DataFrame(data)

# Write to Excel
output_file = "numeric_data_Excel_Sheet.xlsx"
df.to_excel(output_file, index=False)

print(f"Numeric data written successfully to {output_file}")
```

```
Numeric data written successfully to numeric_data_Excel_Sheet.xlsx
```

In [43]:
```python
data = pd.read_excel('numeric_data_Excel_Sheet.xlsx')
print(data) # print the numeric data from excel
```

```
   Product_ID  Quantity_Sold  Price_Per_Unit  Total_Sales
0         101             20             100         2000
1         102             35             150         5250
2         103             15             120         1800
3         104             50              80         4000
```

7.Write text data into a Excel File

In [46]:
```
import pandas as pd

# Create text data
data = {
    "Name": ["Alice", "Bob", "Charlie", "David"],
    "City": ["New York", "Los Angeles", "Chicago", "Houston"],
    "Department": ["HR", "IT", "Finance", "Marketing"]
}

# Convert to DataFrame
df = pd.DataFrame(data)

# Write to Excel
output_file = "text_data_excel_sheet.xlsx"
df.to_excel(output_file, index=False)

print(f"Text data written successfully to {output_file}")
```

```
Text data written successfully to text_data_excel_sheet.xlsx
```

In [48]:
```
data = pd.read_excel('text_data_excel_sheet.xlsx')
print(data) # print the text data from excel
```

```
      Name         City Department
0    Alice     New York         HR
1      Bob  Los Angeles         IT
2  Charlie      Chicago    Finance
3    David      Houston  Marketing
```

TASK-3: Handling JSON

1. Write the output of a Python Code into a JSON Format/File

In [52]:
```
import json
```

In [58]:
```
# Extract the Success call test result from Call Test Measure.xlsx
call_test_df = df[df['Call Test Result'] == 'SUCCESS']
print("Calls Test Results:\n", call_test_df)
```

```
Calls Test Results:
                Date Of Test  Signal (dBm)  Speed (m/s)  \
0       2017-07-01 00:00:27         -61.0    68.800003
1       2017-07-01 00:02:57         -61.0    68.769997
2       2017-07-01 00:05:29         -71.0    69.169998
3       2017-07-01 00:08:02         -65.0    69.279999
4       2017-07-01 00:10:30        -103.0     0.820000
...                     ...           ...          ...
105824  2017-10-31 23:38:56        -111.0    -1.000000
105825  2017-10-31 23:43:47        -111.0     0.800000
105826  2017-10-31 23:48:33        -111.0    -1.000000
105827  2017-10-31 23:50:19        -111.0    -1.000000
105828     02-07-2017 10:30         -75.0    55.200000

        Distance from site (m)  Call Test Duration (s) Call Test Result  \
0                      1048.60                    90.0          SUCCESS
1                      1855.54                    90.0          SUCCESS
2                      1685.62                    90.0          SUCCESS
3                      1770.92                    90.0          SUCCESS
4                       256.07                    60.0          SUCCESS
...                        ...                     ...              ...
105824                 1177.42                    90.0          SUCCESS
105825                 1159.05                    90.0          SUCCESS
105826                 1153.14                    90.0          SUCCESS
105827                 1153.14                    90.0          SUCCESS
105828                  850.40                   120.0          SUCCESS

       Call Test Technology  Call Test Setup Time (s)  MOS
0                      UMTS                      0.56  2.1
1                      UMTS                      0.45  3.2
2                      UMTS                      0.51  2.1
3                      UMTS                      0.00  1.0
4                      UMTS                      3.35  3.6
...                     ...                       ...  ...
105824                  LTE                      0.84  4.4
105825                  LTE                      0.43  4.4
105826                  LTE                      0.52  4.3
105827                  LTE                      0.80  4.4
105828                  LTE                      0.45  3.5

[105149 rows x 9 columns]
```

In [60]:
```python
# The 'orient' parameter controls the JSON format.
# 'records' creates a list of JSON objects, with each object being a row.
# The 'indent' parameter makes the file human-readable.
call_test_df.to_json(
    'call_test.json',
    orient='records',
    indent=4
)

print("Call test results have been written to call_test.json")
```

```
Call test results have been written to call_test.json
```

In [62]:
```python
output_filename = 'call_test.json' #Write the filtered DataFrame to a JSON file.
call_test_df.to_json(
    output_filename,
    orient='records',
    indent=4
)
```

In [66]:
```python
# Open the JSON file safely
try:
    with open(output_filename, 'r') as json_file:
        # Load the data into a Python object (list/dict)
        data = json.load(json_file)

    # Pretty-print with indentation
    print(f"Displaying the content of {output_filename} (first 10 records only):")
    if isinstance(data, list):
        # Print only first 10 items to avoid flooding console
        print(json.dumps(data[:10], indent=4))
    else:
        print(json.dumps(data, indent=4))

    print(f"\nCall test results have been written to and displayed from {output_filename}")

except FileNotFoundError:
    print(f"Error: File '{output_filename}' not found.")
except json.JSONDecodeError:
    print(f"Error: File '{output_filename}' is not a valid JSON file.")
except Exception as e:
    print("An unexpected error occurred:", e)
```

Displaying the content of call_test.json (first 10 records only):


```
[
    {
        "Date Of Test": 1498867227000,
        "Signal (dBm)": -61.0,
        "Speed (m/s)": 68.8000030518,
        "Distance from site (m)": 1048.6,
        "Call Test Duration (s)": 90.0,
        "Call Test Result": "SUCCESS",
        "Call Test Technology": "UMTS",
        "Call Test Setup Time (s)": 0.56,
        "MOS": 2.1
    },
    {
        "Date Of Test": 1498867377000,
        "Signal (dBm)": -61.0,
        "Speed (m/s)": 68.7699966431,
        "Distance from site (m)": 1855.54,
        "Call Test Duration (s)": 90.0,
        "Call Test Result": "SUCCESS",
        "Call Test Technology": "UMTS",
        "Call Test Setup Time (s)": 0.45,
        "MOS": 3.2
    },
    {
        "Date Of Test": 1498867529000,
        "Signal (dBm)": -71.0,
        "Speed (m/s)": 69.1699981689,
        "Distance from site (m)": 1685.62,
        "Call Test Duration (s)": 90.0,
        "Call Test Result": "SUCCESS",
        "Call Test Technology": "UMTS",
        "Call Test Setup Time (s)": 0.51,
        "MOS": 2.1
    },
    {
        "Date Of Test": 1498867682000,
        "Signal (dBm)": -65.0,
        "Speed (m/s)": 69.2799987793,
        "Distance from site (m)": 1770.92,
        "Call Test Duration (s)": 90.0,
        "Call Test Result": "SUCCESS",
        "Call Test Technology": "UMTS",
        "Call Test Setup Time (s)": 0.0,
        "MOS": 1.0
    },
    {
        "Date Of Test": 1498867830000,
        "Signal (dBm)": -103.0,
        "Speed (m/s)": 0.8199999928,
        "Distance from site (m)": 256.07,
        "Call Test Duration (s)": 60.0,
        "Call Test Result": "SUCCESS",
        "Call Test Technology": "UMTS",
        "Call Test Setup Time (s)": 3.35,
        "MOS": 3.6
    },
    {
        "Date Of Test": 1498867837000,
        "Signal (dBm)": -61.0,
        "Speed (m/s)": 68.8600006104,
        "Distance from site (m)": 452.5,
        "Call Test Duration (s)": 90.0,
        "Call Test Result": "SUCCESS",
        "Call Test Technology": "UMTS",
        "Call Test Setup Time (s)": 0.0,
        "MOS": 1.0
    },
    {
        "Date Of Test": 1498867988000,
        "Signal (dBm)": -63.0,
        "Speed (m/s)": 68.7600021362,
        "Distance from site (m)": 899.88,
        "Call Test Duration (s)": 90.0,
        "Call Test Result": "SUCCESS",
        "Call Test Technology": "UMTS",
        "Call Test Setup Time (s)": 0.49,
        "MOS": 2.1
    },
    {
        "Date Of Test": 1498868277000,
        "Signal (dBm)": -73.0,
        "Speed (m/s)": 70.0199966431,
```

```
        "Distance from site (m)": 296.19,
        "Call Test Duration (s)": 90.0,
        "Call Test Result": "SUCCESS",
        "Call Test Technology": "UMTS",
        "Call Test Setup Time (s)": 0.0,
        "MOS": 1.0
    },
    {
        "Date Of Test": 1498868429000,
        "Signal (dBm)": -78.0,
        "Speed (m/s)": 27.7900009155,
        "Distance from site (m)": null,
        "Call Test Duration (s)": 90.0,
        "Call Test Result": "SUCCESS",
        "Call Test Technology": "LTE",
        "Call Test Setup Time (s)": 0.42,
        "MOS": 4.4
    },
    {
        "Date Of Test": 1498868581000,
        "Signal (dBm)": -61.0,
        "Speed (m/s)": 22.1200008392,
        "Distance from site (m)": 21532.25,
        "Call Test Duration (s)": 90.0,
        "Call Test Result": "SUCCESS",
        "Call Test Technology": "UMTS",
        "Call Test Setup Time (s)": 0.52,
        "MOS": 2.1
    }
]

Call test results have been written to and displayed from call_test.json
```


2.Parse a JSON file and search for a value

In [ ]: