In [ ]: 
```python
#import required libraries
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
```

First in first we are going to import our datas from specified .xlsx files

In [ ]: 
```python
# specifying the file path
file_path = "../MTA_Daily_Ridership_Data__Beginning_2020.xlsx"

# read data from Excel file
data_frame = pd.read_excel(file_path, header=None)  # Set header to None to treat the first row as data

# select data from columns 'R' and 'S', rows 88 to 91
selected_data = data_frame.iloc[87:91, [17, 18]]  # Assuming 'R' is in column 18 and 'S' is in column 19

# print the selected data
print(selected_data)
```
```
            17            18
87      Subway   3.195718e+09
88         Bus   1.347343e+09
89        LIRR   1.640977e+08
90  Metro North   1.368428e+08
```

Here we have specified datas from now on we are going to render these datas as piechart.

In [ ]: 
```python
# seperate datas via list
column_name = []
column_data = []

for item in selected_data[17]:
    column_name.append(item)

for item in selected_data[18]:
    column_data.append(item)


print(column_name)
print(column_data)
```
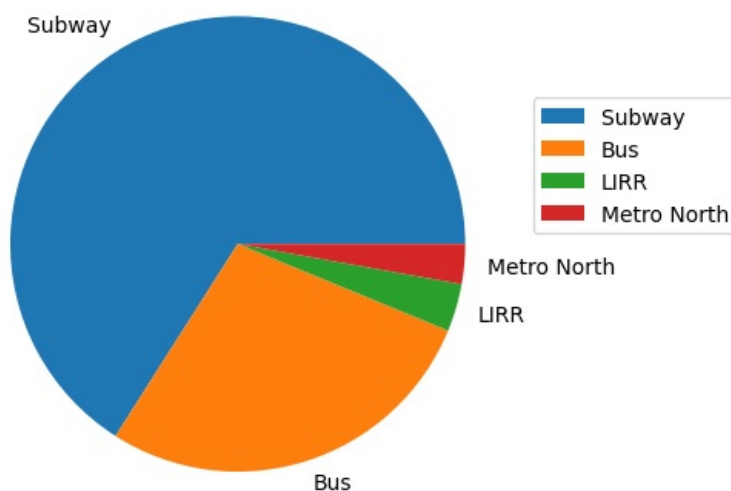```
['Subway ', 'Bus', 'LIRR', 'Metro North']
[3195718389.0, 1347343269.0, 164097698.0, 136842781.0]
```

In [ ]: 
```python
#plot data as pie chart
plt.pie(column_data, labels=column_name)
plt.title('MTA Daily Ridership Data')

#get legend to bottom of the chart
plt.legend(loc='lower left', bbox_to_anchor=(1.0, 0.5))
plt.show()

#save the chart as png file
plt.savefig('MTA_Daily_Ridership_Data__Beginning_2020.png')
```



```
<Figure size 640x480 with 0 Axes>
```

Graph 8 – Correlation between MDBF and Ridership last graph for proposal

```
In [ ]:  # specifying the file path
         file_path = "../MDBF and Ridership Correlation.xlsx"

         # read data from Excel file
         data_frame = pd.read_excel(file_path, header=None)  # Set header to None to treat the first row as data

         # select data from column 'C'
         C_column = data_frame.iloc[1:1371,1]  # Assuming 'C' is in column 3

         # selec data from column 'B'
         B_column = data_frame.iloc[1:1371,2]  # Assuming 'B' is in column 2
```

```
In [ ]:  # Assuming C_column and B_column are your data arrays
         C_column = C_column.astype(float)
         B_column = B_column.astype(float)

         # Make regression line
         z = np.polyfit(C_column, B_column, 1)
         p = np.poly1d(z)
         plt.plot(C_column, p(C_column), "r--")

         # Draw scatter plot
         plt.scatter(C_column, B_column, color='blue', marker='o', s=10)
         plt.title('MTA Daily Ridership Data')
         plt.xlabel('MTA Subway Ridership')
         plt.grid(True)
         plt.ylabel('MDBF')
         #linspace to max value of x axis

         plt.show()
```