Assignment : Tutorial - 11 - FacetGrid and Facetwrap

Faceting is a great data visualization technique that uses “small multiples” i.e. the use of same type of plots multiple times in a panel. Each “small multiple” is a same type of plot but for a different group or category in the data.

FacetGrid : Multi-plot grid for plotting conditional relationships. FacetGrid for x,y will display x*y plots even if some plots are empty.

In [ ]:
```
# import liberay of seaborn, matplotlib, pandas and numpy
import seaborn as sns
import matplotlib.pyplot as plt
import pandas as pd
import numpy as np
```

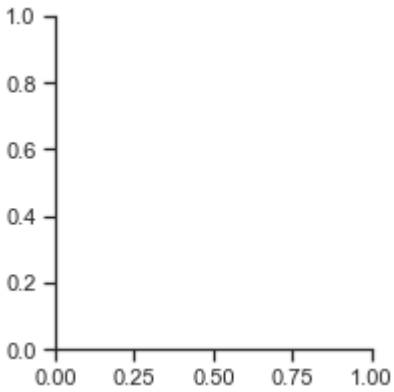
Load data set of data_viz.csv

In [ ]:
```
# Load data Set
data_viz = pd.read_csv("data_viz.csv")
data_viz.head()
```

Out[ ]:

	Timestamp	Gender	Age	Location	Time of class (pm)	Duration (min)
0	1/3/2022 19:09:29	Male	16-30	Pakistan	10:30	60
1	1/3/2022 19:09:33	Male	16-30	Pakistan	10:00	60
2	1/3/2022 19:09:33	Male	16-30	Pakistan	10:00	30
3	1/3/2022 19:09:33	Male	30-40	Pakistan	09:30	30
4	1/3/2022 19:09:34	Male	16-30	East	09:30	60

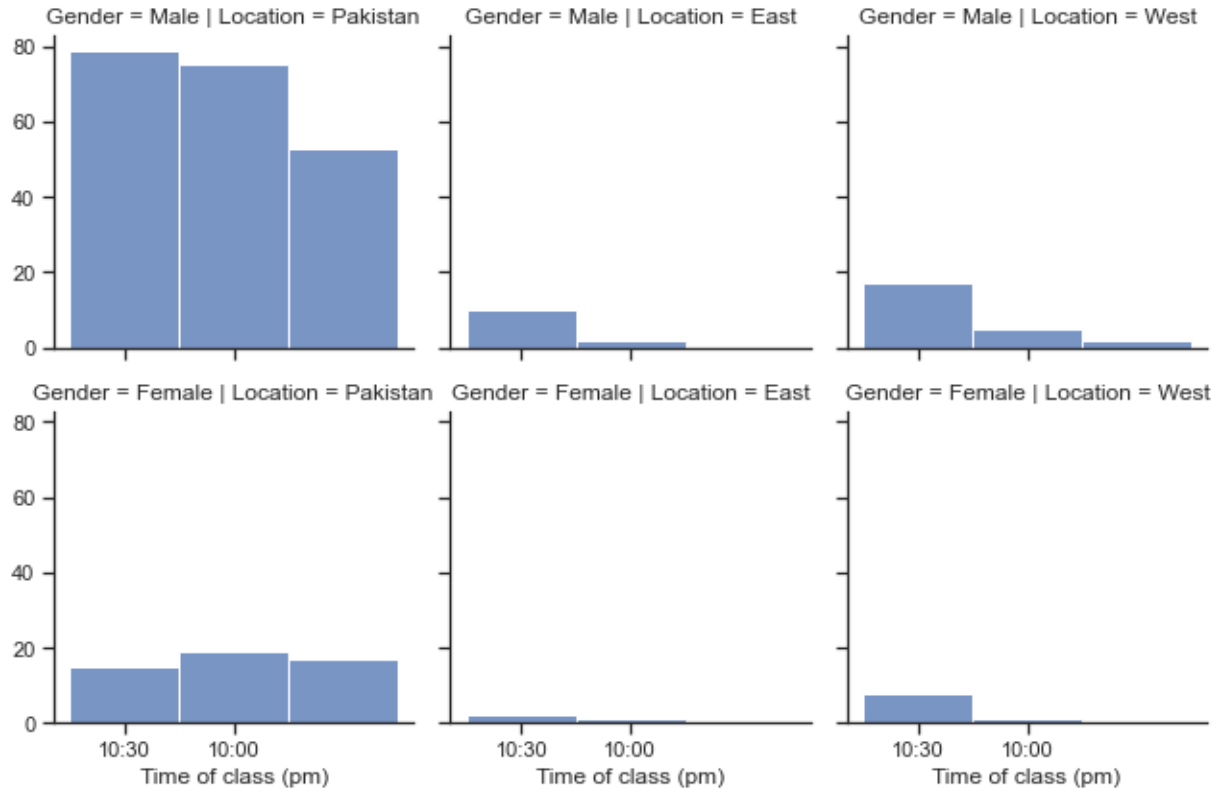
In [ ]:
```
sns.set_theme(style="ticks", color_codes=True)
sns.FacetGrid(data_viz) # Simple FacetGrid function
plt.show()
```



FacetGrid for histogram plot

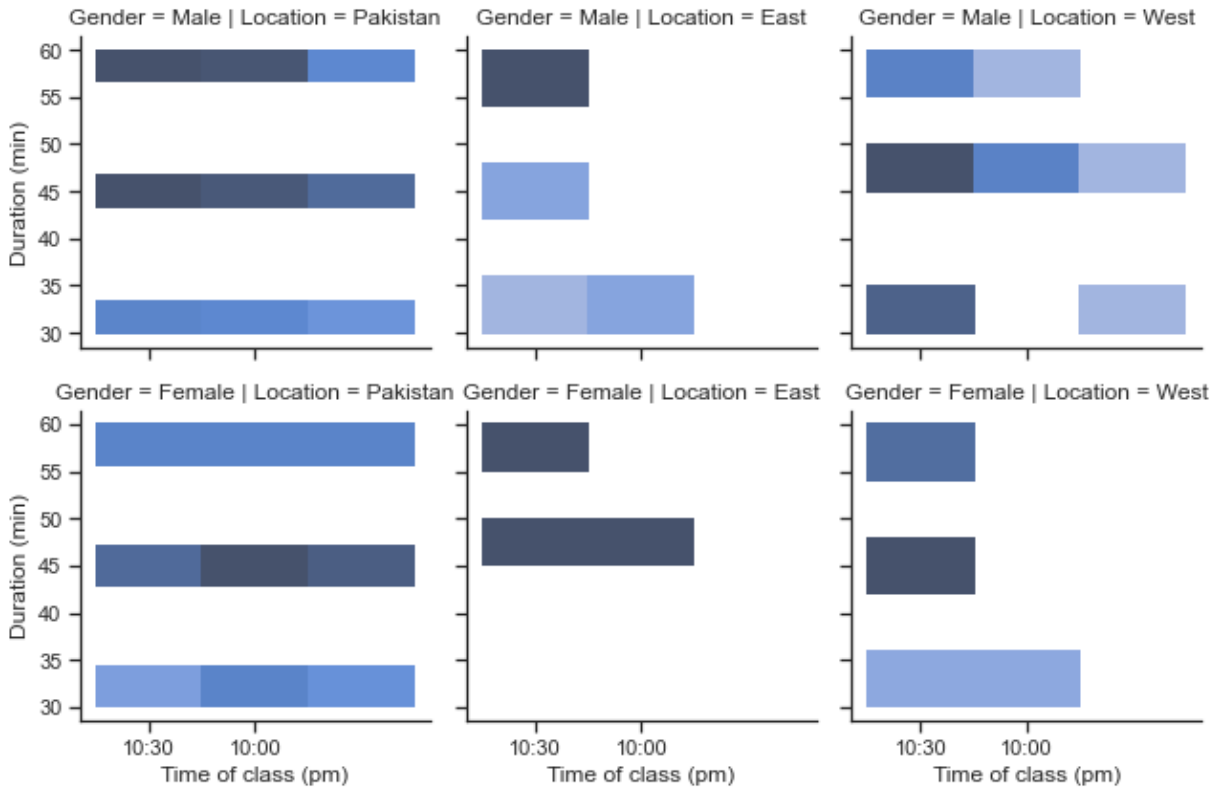
In [ ]:
```
# To draw a plot on every facet, pass a function and the name of one or more columns
g=sns.FacetGrid(data_viz, row ="Gender", col ="Location")
g.map_dataframe(sns.histplot,"Time of class (pm)")
```

Out[ ]:
```
<seaborn.axisgrid.FacetGrid at 0x216e158e220>
```



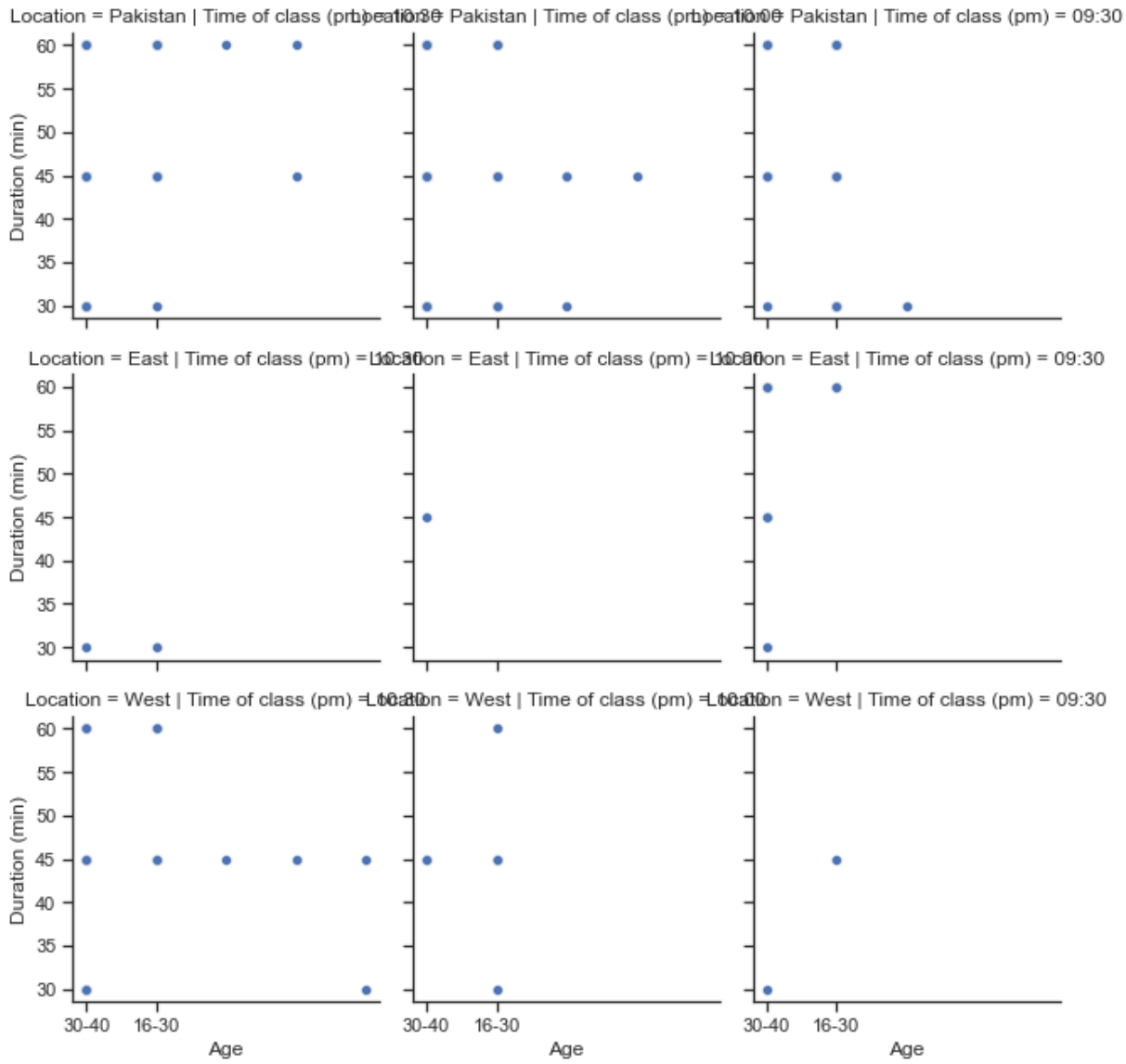
In [ ]:
```
g=sns.FacetGrid(data_viz, row ="Gender", col ="Location")
g.map_dataframe(sns.histplot,"Time of class (pm)","Duration (min)")
```

Out[ ]: <seaborn.axisgrid.FacetGrid at 0x216e159b430>



FacetGrid for Scatter plot

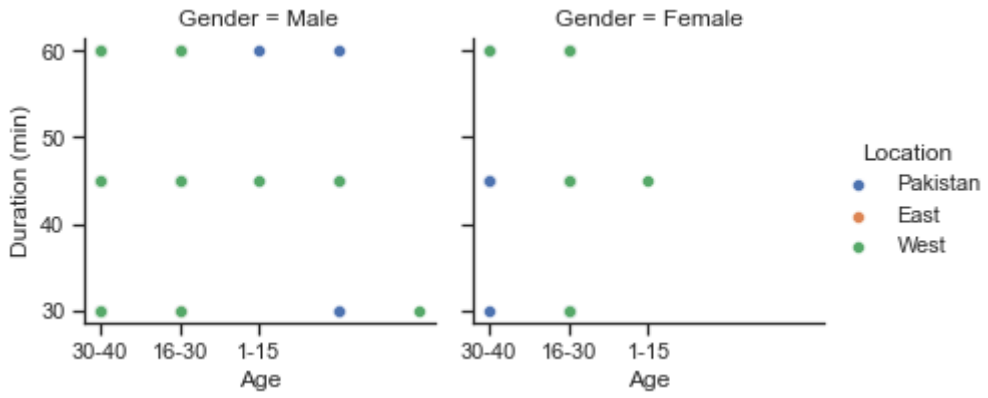
In [ ]:
```
g = sns.FacetGrid(data_viz, col="Time of class (pm)",  row="Location")
g.map(sns.scatterplot, "Age","Duration (min)")
plt.show()
```



In [ ]:

```
# The FacetGrid constructor accepts a hue parameter.
g = sns.FacetGrid(data_viz, col="Gender",  hue="Location")
g.map(sns.scatterplot, "Timestamp","Duration (min)")
g.add_legend()
```

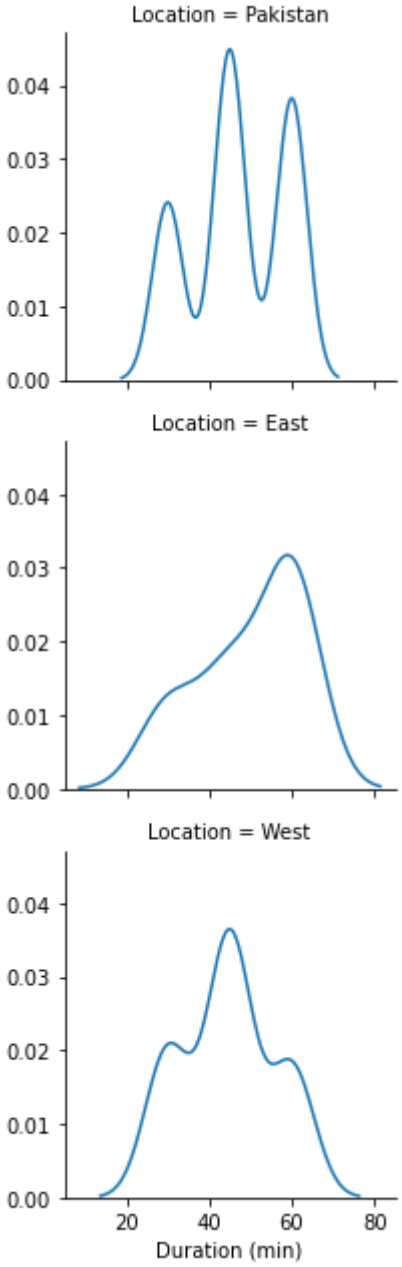
Out[ ]: <seaborn.axisgrid.FacetGrid at 0x216947c00d0>



In [ ]:

```
g = sns.FacetGrid(data_viz, row="Location")
g.map(sns.kdeplot, "Duration (min)")
```

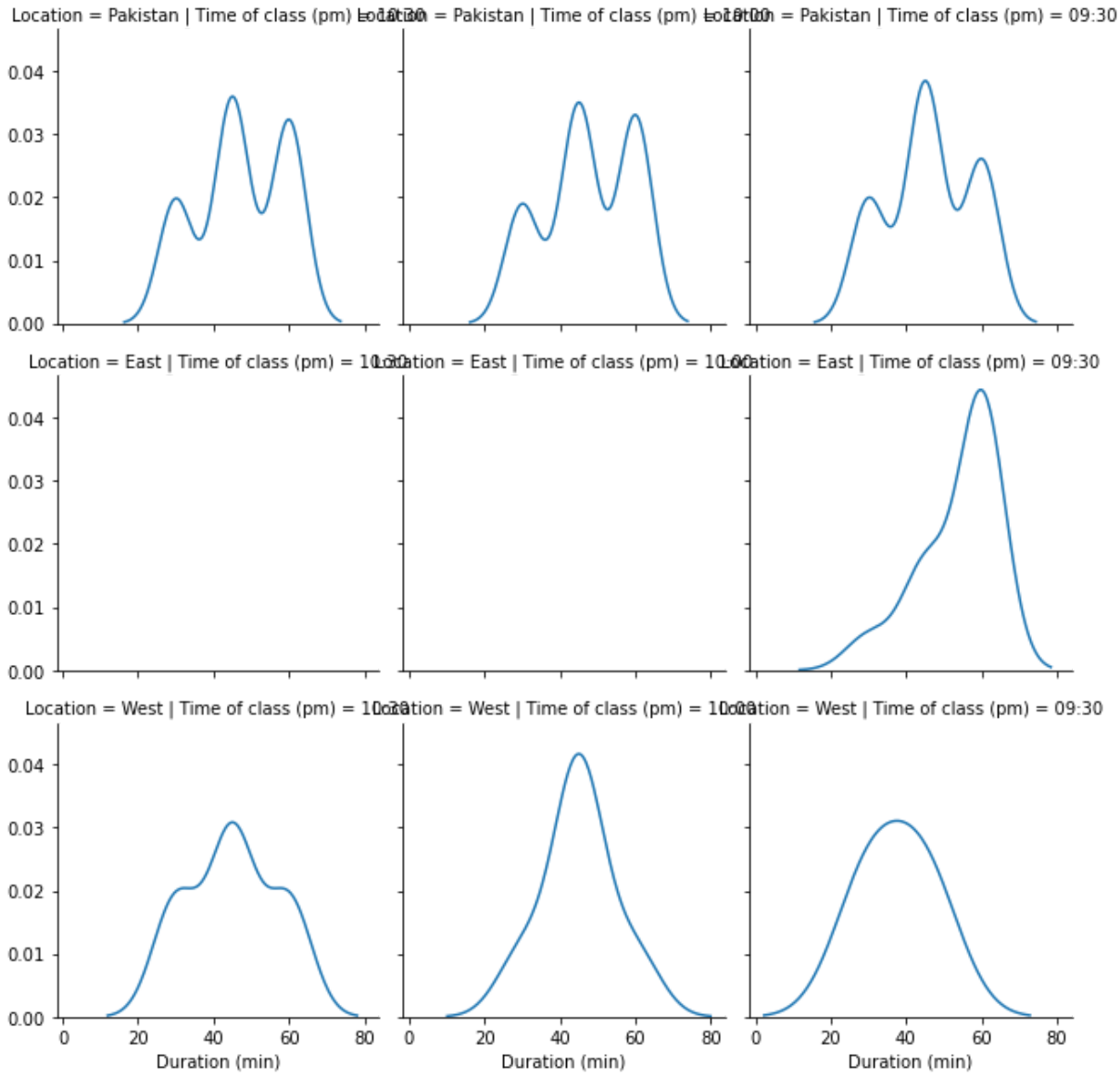
Out[ ]: <seaborn.axisgrid.FacetGrid at 0x215d132ad00>



In [ ]:
```
g = sns.FacetGrid(data_viz, row="Location", col="Time of class (pm)")
g.map(sns.kdeplot, "Duration (min)")
```

```
C:\Users\Faiz\anaconda3\lib\site-packages\seaborn\distributions.py:306: UserWarning:
Dataset has 0 variance; skipping density estimate.
C:\Users\Faiz\anaconda3\lib\site-packages\seaborn\distributions.py:306: UserWarning:
Dataset has 0 variance; skipping density estimate.
```

Out[ ]: <seaborn.axisgrid.FacetGrid at 0x215d14b5ca0>

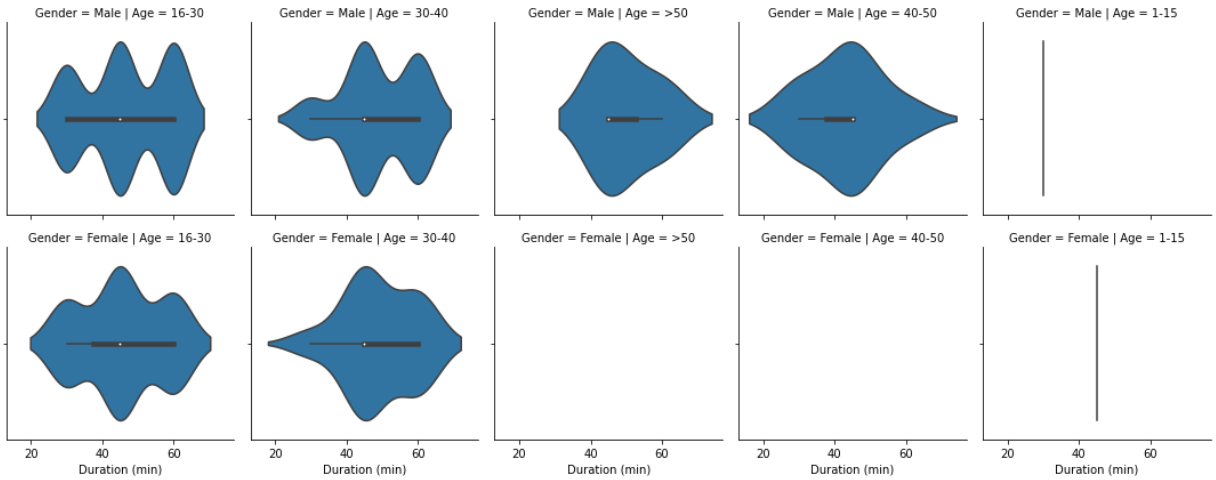


In [ ]:

```
g = sns.FacetGrid(data_viz, row="Gender", col="Age")
g.map(sns.violinplot,"Duration (min)" )
```

```
C:\Users\Faiz\anaconda3\lib\site-packages\seaborn\axisgrid.py:643: UserWarning: Usin
g the violinplot function without specifying `order` is likely to produce an incorre
ct plot.
```

Out[ ]: <seaborn.axisgrid.FacetGrid at 0x215e8795520>



Facet Wrap

Facet_Wrap() creates a collection of plots (facets), where each plot is differentiated by the faceting variable. These plots are wrapped into a certain number of columns or rows as specified by the user.

In [ ]:
```
pip install plotnine
```

```
Collecting plotnine
  Downloading plotnine-0.8.0-py3-none-any.whl (4.7 MB)
Requirement already satisfied: numpy>=1.19.0 in c:\users\faiz\anaconda3\lib\site-pac
kages (from plotnine) (1.20.1)
Collecting mizani>=0.7.3
  Using cached mizani-0.7.3-py3-none-any.whl (63 kB)
Collecting descartes>=1.1.0
  Using cached descartes-1.1.0-py3-none-any.whl (5.8 kB)
Requirement already satisfied: statsmodels>=0.12.1 in c:\users\faiz\anaconda3\lib\si
te-packages (from plotnine) (0.12.2)
Requirement already satisfied: scipy>=1.5.0 in c:\users\faiz\anaconda3\lib\site-pack
ages (from plotnine) (1.6.2)
Requirement already satisfied: matplotlib>=3.1.1 in c:\users\faiz\anaconda3\lib\site
-packages (from plotnine) (3.3.4)
Requirement already satisfied: patsy>=0.5.1 in c:\users\faiz\anaconda3\lib\site-pack
ages (from plotnine) (0.5.1)
Requirement already satisfied: pandas>=1.1.0 in c:\users\faiz\anaconda3\lib\site-pac
kages (from plotnine) (1.2.4)
Requirement already satisfied: cycler>=0.10 in c:\users\faiz\anaconda3\lib\site-pack
ages (from matplotlib>=3.1.1->plotnine) (0.10.0)
Requirement already satisfied: python-dateutil>=2.1 in c:\users\faiz\anaconda3\lib\s
ite-packages (from matplotlib>=3.1.1->plotnine) (2.8.1)
Requirement already satisfied: kiwisolver>=1.0.1 in c:\users\faiz\anaconda3\lib\site
-packages (from matplotlib>=3.1.1->plotnine) (1.3.1)
Requirement already satisfied: pyparsing!=2.0.4,!=2.1.2,!=2.1.6,>=2.0.3 in c:\users
\faiz\anaconda3\lib\site-packages (from matplotlib>=3.1.1->plotnine) (2.4.7)
Requirement already satisfied: pillow>=6.2.0 in c:\users\faiz\anaconda3\lib\site-pac
kages (from matplotlib>=3.1.1->plotnine) (8.2.0)
Requirement already satisfied: six in c:\users\faiz\anaconda3\lib\site-packages (fro
m cycler>=0.10->matplotlib>=3.1.1->plotnine) (1.15.0)
Collecting palettable
  Using cached palettable-3.3.0-py2.py3-none-any.whl (111 kB)
Requirement already satisfied: pytz>=2017.3 in c:\users\faiz\anaconda3\lib\site-pack
ages (from pandas>=1.1.0->plotnine) (2021.1)
Installing collected packages: palettable, mizani, descartes, plotnineNote: you may
need to restart the kernel to use updated packages.

Successfully installed descartes-1.1.0 mizani-0.7.3 palettable-3.3.0 plotnine-0.8.0
```

In [ ]:
```
import pandas as pd

# from plotnine import *
# from plotnine.data import *
import seaborn as sns

# from plotnine.data import mpg
from plotnine import ggplot
```

In [ ]:
```
# Load data Set
data_viz = pd.read_csv("data_viz.csv")
data_viz.head()
```

Out[ ]:

	Timestamp	Gender	Age	Location	Time of class (pm)	Duration (min)
0	1/3/2022 19:09:29	Male	16-30	Pakistan	10:30	60
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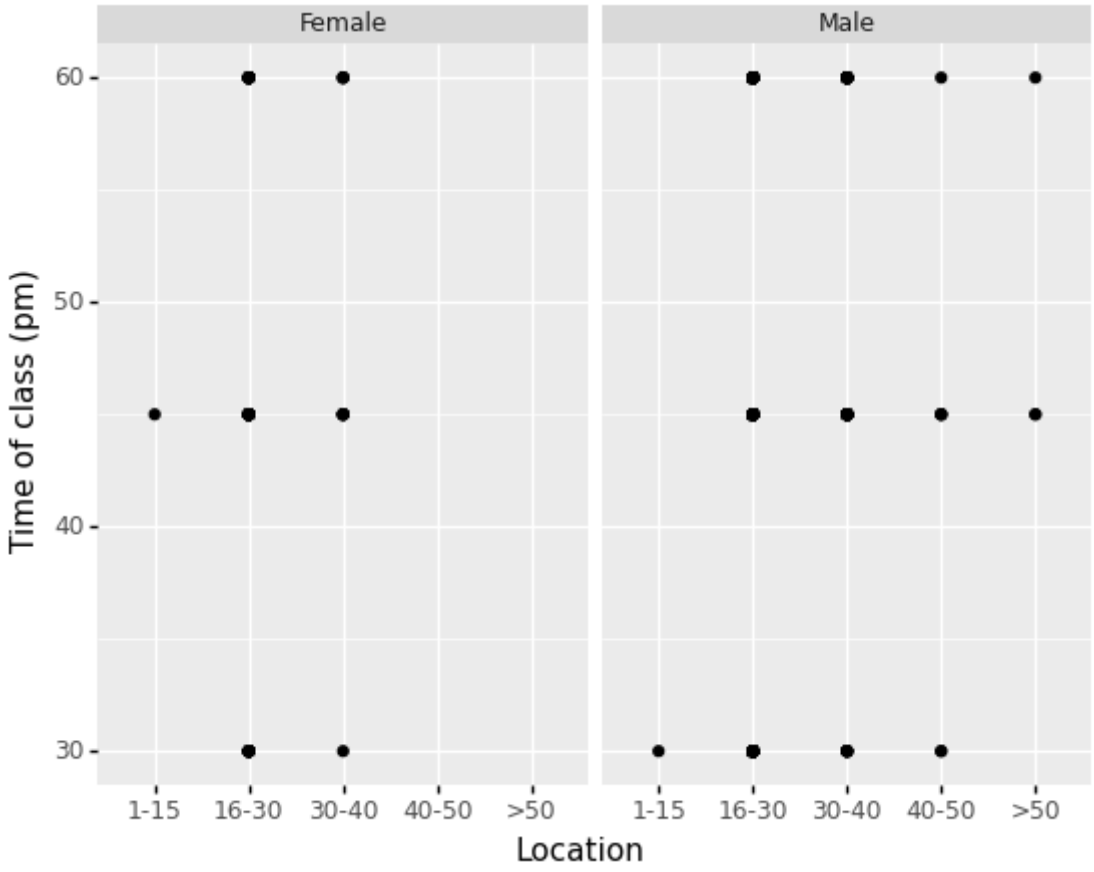
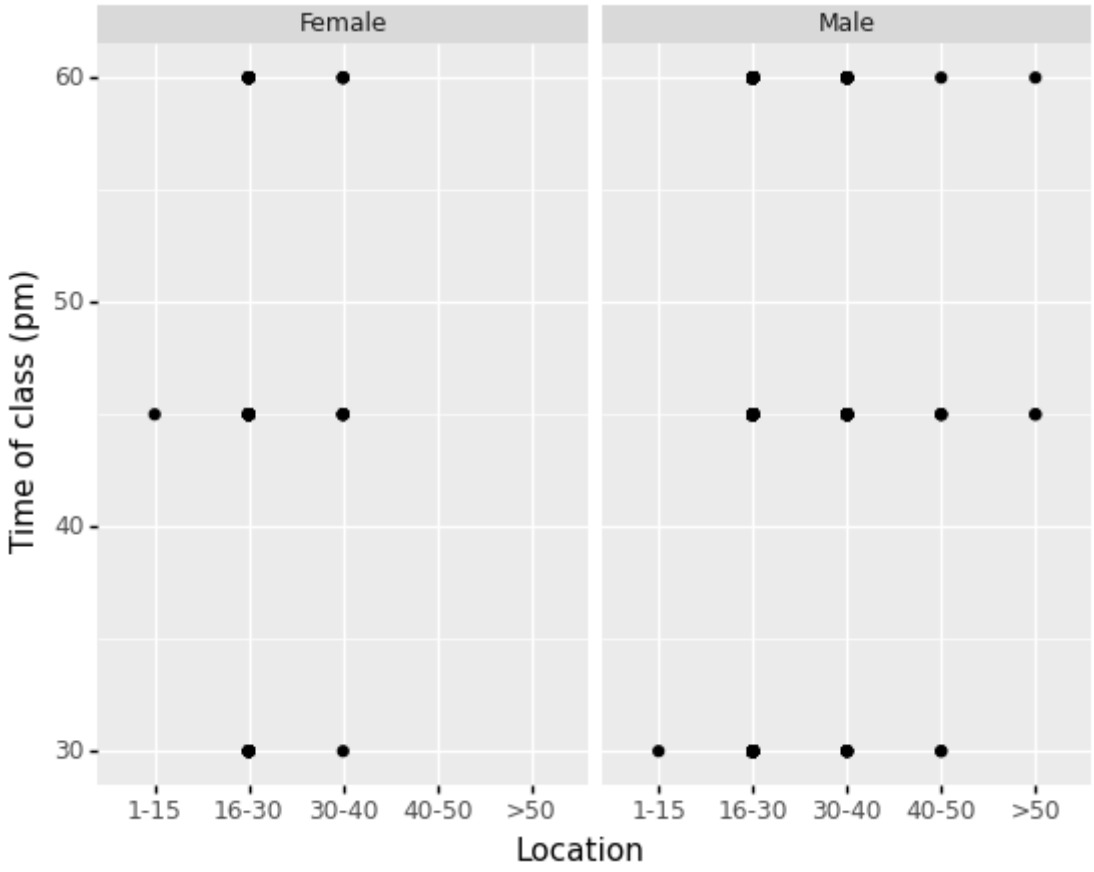
	Timestamp	Gender	Age	Location	Time of class (pm)	Duration (min)
2	1/3/2022 19:09:33	Male	16-30	Pakistan	10:00	30
3	1/3/2022 19:09:33	Male	30-40	Pakistan	09:30	30
4	1/3/2022 19:09:34	Male	16-30	East	09:30	60

In [ ]:
```
(
    ggplot(data_viz, aes(x='Age', y='Duration (min)'))
    + geom_point()
    + facet_wrap('Gender')
    + labs(x='Location', y='Time of class (pm)')
)
```



Out[ ]: <ggplot: (143289858301)>

In [ ]:
```
(
    ggplot(data_viz, aes(x='Age', y='Duration (min)'))
    + geom_point()
    + facet_wrap('Gender',
                 ncol = 6 )
    + labs(x='Location', y='Time of class (pm)')
)
```



Out[ ]: <ggplot: (143294344638)>