CMS COLLEGE OF ENGINEERING AND TECHNOLOGY

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

INTELLIGENT VEHICLE DAMAGE ASSESSMENT & COST ESTIMATOR FOR INSURANCE COMPANIES-**ASSIGNMENT 2**

DATE : 26-09-2022

PROBLEM : TO ANSWER THE QUESTIONS FOR THE ANSWERS

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OUTPUT:

SCREENSHOT:

#Importing Libraries

In [10]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
df=pd.read_csv('/content/Churn_Modelling.csv')
df
```

Out[10]:

	RowNumber	CustomerId	Surname	CreditScore	Geography	Gender	Age	Tenure	Balance	NumOfProducts	HasCrCard	IsActiveMember	EstimatedSa
0	1	15634602	Hargrave	619	France	Female	42	2	0.00	1	1	1	10134
1	2	15647311	Hill	608	Spain	Female	41	1	83807.86	1	0	1	11254
2	3	15619304	Onio	502	France	Female	42	8	159660.80	3	1	0	11393
3	4	15701354	Boni	699	France	Female	39	1	0.00	2	0	0	9382
4	5	15737888	Mitchell	850	Spain	Female	43	2	125510.82	1	1	1	7908
...	...	...	...	...	...	...	...	...	...	...	...	...	...
9995	9996	15606229	Obijiaku	771	France	Male	39	5	0.00	2	1	0	9627
9996	9997	15569892	Johnstone	516	France	Male	35	10	57369.61	1	1	1	10169
9997	9998	15584532	Liu	709	France	Female	36	7	0.00	1	0	1	4208
9998	9999	15682355	Sabbatini	772	Germany	Male	42	3	75075.31	2	1	0	9288
9999	10000	15628319	Walker	792	France	Female	28	4	130142.79	1	1	0	3819

10000 rows × 14 columns

In [12]:
```
df.shape
```

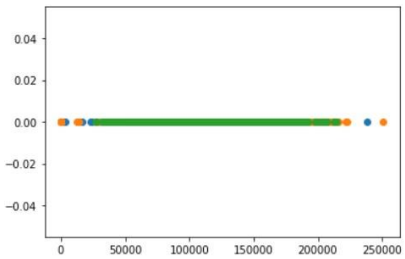
Out[12]:
```
(10000, 14)
```

Univariate , Bivariate and Multivariate analysis

Univariate analysis

In [14]:
```
df_france=df.loc[df['Geography']=='France']
df_spain=df.loc[df['Geography']=='Spain']
df_germany=df.loc[df['Geography']=='Germany']
```

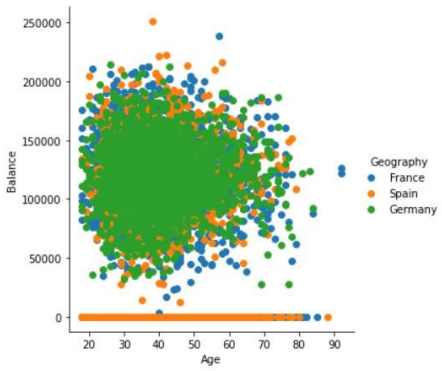
In [15]:
```
plt.plot(df_france['Balance'],np.zeros_like(df_france['Balance']),'o')
plt.plot(df_spain['Balance'],np.zeros_like(df_spain['Balance']),'o')
plt.plot(df_germany['Balance'],np.zeros_like(df_germany['Balance']),'o')
plt.xlabel('Age')
plt.show()
```



Bivariate Analysis ¶

In [16]:
```
sns.FacetGrid(df,hue="Geography",size=5).map(plt.scatter,"Age","Balance").add_legend();
plt.show()
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/axisgrid.py:337: UserWarning: The `size` parameter has been renamed to `height`;
please update your code.
  warnings.warn(msg, UserWarning)
```

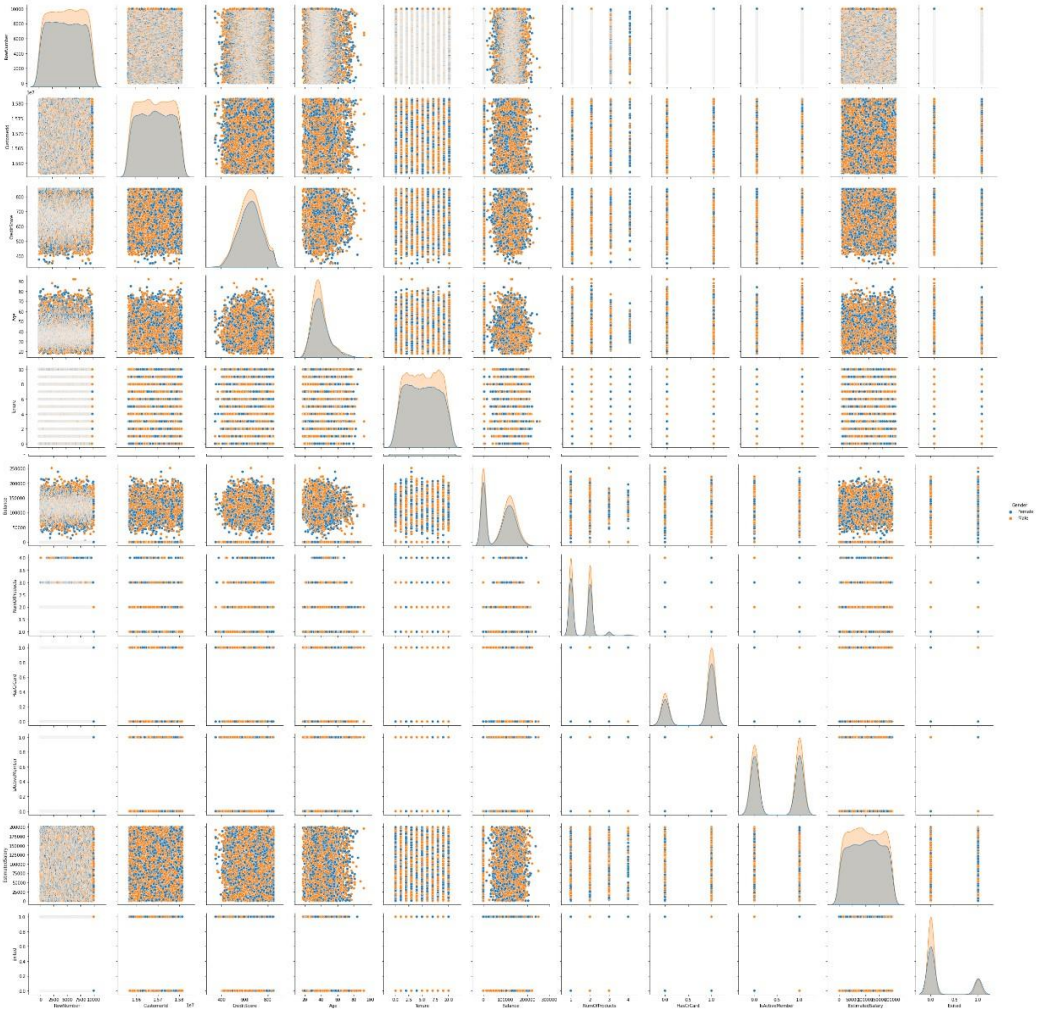


Multivariate Analysis

In [17]:
```
sns.pairplot(df,hue="Gender",size=3)
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/axisgrid.py:2076: UserWarning: The `size` parameter has been renamed to `height
`; please update your code.
  warnings.warn(msg, UserWarning)
```

Out[17]: <seaborn.axisgrid.PairGrid at 0x7fc904178f10>



Descriptive Statistics

In [18]:
```
df.head()
```

Out[18]:

	RowNumber	CustomerId	Surname	CreditScore	Geography	Gender	Age	Tenure	Balance	NumOfProducts	HasCrCard	IsActiveMember	EstimatedSalary
0	1	15634602	Hargrave	619	France	Female	42	2	0.00	1	1	1	101348.88
1	2	15647311	Hill	608	Spain	Female	41	1	83807.86	1	0	1	112542.58
2	3	15619304	Onio	502	France	Female	42	8	159660.80	3	1	0	113931.57
3	4	15701354	Boni	699	France	Female	39	1	0.00	2	0	0	93826.63
4	5	15737888	Mitchell	850	Spain	Female	43	2	125510.82	1	1	1	79084.10

In [19]:
```
df.mean()  # Get the mean of each column
```

```
/usr/local/lib/python3.7/dist-packages/ipykernel_launcher.py:1: FutureWarning: Dropping of nuisance columns in DataFrame reduct
ions (with 'numeric_only=None') is deprecated; in a future version this will raise TypeError.  Select only valid columns before
calling the reduction.
  """Entry point for launching an IPython kernel.
```

Out[19]:
```
RowNumber          5.000500e+03
CustomerId         1.569094e+07
CreditScore        6.505288e+02
Age                3.892180e+01
Tenure             5.012800e+00
Balance            7.648589e+04
NumOfProducts      1.530200e+00
HasCrCard          7.055000e-01
IsActiveMember     5.151000e-01
EstimatedSalary    1.000902e+05
Exited             2.037000e-01
dtype: float64
```

```
plt.vlines(norm_data.median(),   # Plot red line at median
           ymin=0,
           ymax=0.4,
           linewidth=2.0,
           color="red");
```