Task 1 - Analysis on ML Test Scores

import the necessary libraries and load the files needed for our EDA

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

Load the data

```
df = pd.read_csv(r"/content/scores_data.csv")
```

```
df.head()
```

	Batch	User_ID	Score
0	AI_ELITE_7	uid_149	6 / 7
1	AI_ELITE_7	uid_148	6 / 7
2	AI_ELITE_7	uid_147	7 / 7
3	AI_ELITE_7	uid_146	7 / 7
4	AI_ELITE_7	uid_145	4 / 7

Information about data

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 149 entries, 0 to 148
Data columns (total 3 columns):
 #   Column       Non-Null Count  Dtype
---  ------       --------------  -----
 0   Batch        149 non-null    object
 1   User_ID      149 non-null    object
 2      Score     149 non-null    object
dtypes: object(3)
memory usage: 3.6+ KB
```

```
df.columns
```

```
Index(['Batch ', 'User_ID ', '   Score   '], dtype='object')
```

Report: some extra space is ther so we have to remove it by using strip

```
df.columns = df.columns.str.strip()
```

```
df.columns
```

```
Index(['Batch', 'User_ID', 'Score'], dtype='object')
```

Describe the data - Descriptive statistics

```
df.describe()
```

	Batch	User_ID	Score
count	149	149	149
unique	3	149	8
top	AI_ELITE_7	uid_149	4 / 7
freq	53	1	40

```
df
```

	Batch	User_ID	Score
0	AI_ELITE_7	uid_149	6 / 7
1	AI_ELITE_7	uid_148	6 / 7
2	AI_ELITE_7	uid_147	7 / 7
3	AI_ELITE_7	uid_146	7 / 7
4	AI_ELITE_7	uid_145	4 / 7
...	...	...	...
144	AI_ELITE_4	uid_5	4 / 7
145	AI_ELITE_4	uid_4	4 / 7
146	AI_ELITE_4	uid_3	4 / 7
147	AI_ELITE_4	uid_2	3 / 7
148	AI_ELITE_4	uid_1	2 / 7

149 rows × 3 columns

Duplicate values

```
df.duplicated().sum()
```

```
0
```

Report: returned 0 thsi means there is not a single duplicate values present in our dataset and it is a very good things to know

---

Converting Score column like 7/7 to percentage

```
df["score"] = df['Score'].str.replace("/","")
```

```
df.head(3)
```

	Batch	User_ID	Score	score
0	AI_ELITE_7	uid_149	6 / 7	6 7
1	AI_ELITE_7	uid_148	6 / 7	6 7
2	AI_ELITE_7	uid_147	7 / 7	7 7

```
df['score'] = df['score'].str.replace("  ","")
```

```
def to_percentage():
    for i in range(len(df['score'])):
        df['score'][i] = int(df['score'][i][0]) / int(df['score'][i][1])
to_percentage()
```

```
df.head(3)
```

	Batch	User_ID	Score	score
0	AI_ELITE_7	uid_149	6 / 7	0.857143
1	AI_ELITE_7	uid_148	6 / 7	0.857143
2	AI_ELITE_7	uid_147	7 / 7	1.0

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 149 entries, 0 to 148
Data columns (total 4 columns):
 #   Column   Non-Null Count  Dtype 
---  ------   --------------  ----- 
 0   Batch    149 non-null    object
 1   User_ID  149 non-null    object
 2   Score    149 non-null    object
 3   score    149 non-null    object
dtypes: object(4)
memory usage: 4.8+ KB
```

changing datatype object to float

```
df['score'] = df['score'].astype("float")
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 149 entries, 0 to 148
Data columns (total 4 columns):
 #   Column   Non-Null Count  Dtype
---  ------   --------------  -----
 0   Batch    149 non-null    object
 1   User_ID  149 non-null    object
 2   Score    149 non-null    object
 3   score    149 non-null    float64
dtypes: float64(1), object(3)
memory usage: 4.8+ KB
```

```
df.head()
```

	Batch	User_ID	Score	score
0	AI_ELITE_7	uid_149	6 / 7	0.857143
1	AI_ELITE_7	uid_148	6 / 7	0.857143
2	AI_ELITE_7	uid_147	7 / 7	1.000000
3	AI_ELITE_7	uid_146	7 / 7	1.000000
4	AI_ELITE_7	uid_145	4 / 7	0.571429

```
df.describe()
```

	score
count	149.000000
mean	0.626079
std	0.227457
min	0.000000
25%	0.428571
50%	0.571429
75%	0.714286
max	1.000000

Unique valaues in the data

```
df['score'].unique()
```

```
array([0.85714286, 1.        , 0.57142857, 0.71428571, 0.42857143,
       0.28571429, 0.        , 0.14285714])
```

```
df.columns
```

```
Index(['Batch', 'User_ID', 'Score', 'score'], dtype='object')
```

```
df['Batch'].unique()
```

```
array(['AI_ELITE_7', 'AI_ELITE_6', 'AI_ELITE_4'], dtype=object)
```

User_ID unique values and number of unique values

```
df['User_ID'].nunique()
```

```
149
```

```
df['User_ID'].unique(),df['User_ID'].nunique()
```

```
(array(['uid_149', 'uid_148', 'uid_147', 'uid_146', 'uid_145', 'uid_144',
        'uid_143', 'uid_142', 'uid_141', 'uid_140', 'uid_139', 'uid_138',
        'uid_137', 'uid_136', 'uid_135', 'uid_134', 'uid_133', 'uid_132',
        'uid_131', 'uid_130', 'uid_129', 'uid_128', 'uid_127', 'uid_126',
        'uid_125', 'uid_124', 'uid_123', 'uid_122', 'uid_121', 'uid_120',
        'uid_119', 'uid_118', 'uid_117', 'uid_116', 'uid_115', 'uid_114',
        'uid_113', 'uid_112', 'uid_111', 'uid_110', 'uid_109', 'uid_108',
        'uid_107', 'uid_106', 'uid_105', 'uid_104', 'uid_103', 'uid_102',
        'uid_101', 'uid_100', 'uid_99', 'uid_98', 'uid_97', 'uid_96',
        'uid_95', 'uid_94', 'uid_93', 'uid_92', 'uid_91', 'uid_90',
        'uid_89', 'uid_88', 'uid_87', 'uid_86', 'uid_85', 'uid_84',
        'uid_83', 'uid_82', 'uid_81', 'uid_80', 'uid_79', 'uid_78',
        'uid_77', 'uid_76', 'uid_75', 'uid_74', 'uid_73', 'uid_72',
        'uid_71', 'uid_70', 'uid_69', 'uid_68', 'uid_67', 'uid_66',
        'uid_65', 'uid_64', 'uid_63', 'uid_62', 'uid_61', 'uid_60',
        'uid_59', 'uid_58', 'uid_57', 'uid_56', 'uid_55', 'uid_54',
        'uid_53', 'uid_52', 'uid_51', 'uid_50', 'uid_49', 'uid_48',
        'uid_47', 'uid_46', 'uid_45', 'uid_44', 'uid_43', 'uid_42',
        'uid_41', 'uid_40', 'uid_39', 'uid_38', 'uid_37', 'uid_36',
        'uid_35', 'uid_34', 'uid_33', 'uid_32', 'uid_31', 'uid_30',
        'uid_29', 'uid_28', 'uid_27', 'uid_26', 'uid_25', 'uid_24',
        'uid_23', 'uid_22', 'uid_21', 'uid_20', 'uid_19', 'uid_18',
        'uid_17', 'uid_16', 'uid_15', 'uid_14', 'uid_13', 'uid_12',
        'uid_11', 'uid_10', 'uid_9', 'uid_8', 'uid_7', 'uid_6', 'uid_5',
        'uid_4', 'uid_3', 'uid_2', 'uid_1'], dtype=object),
 149)
```

Find the null values

```
df.isnull().sum()
```

```
Batch      0
User_ID    0
Score      0
score      0
dtype: int64
```

```
df.isnull().sum().sum()
```

```
0
```

Report:

No null values

Check datatypes

```
df.dtypes
```

```
Batch       object
User_ID     object
Score       object
score      float64
dtype: object
```

Filter the data

```
print(df['Batch'].unique())
#print(df['User_ID'].unique())
print(df['score'].unique())
```

```
['AI_ELITE_7' 'AI_ELITE_6' 'AI_ELITE_4']
[0.85714286 1.         0.57142857 0.71428571 0.42857143 0.28571429
 0.         0.14285714]
```

```
df[df['Batch']=='AI_ELITE_7'].head()
```

	Batch	User_ID	Score	score
0	AI_ELITE_7	uid_149	6 / 7	0.857143
1	AI_ELITE_7	uid_148	6 / 7	0.857143
2	AI_ELITE_7	uid_147	7 / 7	1.000000
3	AI_ELITE_7	uid_146	7 / 7	1.000000
4	AI_ELITE_7	uid_145	4 / 7	0.571429

```
df[df['Batch']=='AI_ELITE_6'].head()
```

	Batch	User_ID	Score	score
53	AI_ELITE_6	uid_96	3 / 7	0.428571
54	AI_ELITE_6	uid_95	4 / 7	0.571429
55	AI_ELITE_6	uid_94	6 / 7	0.857143
56	AI_ELITE_6	uid_93	6 / 7	0.857143
57	AI_ELITE_6	uid_92	4 / 7	0.571429

```
df[df['Batch']=='AI_ELITE_4'].head()
```

	Batch	User_ID	Score	score
101	AI_ELITE_4	uid_48	7 / 7	1.000000
102	AI_ELITE_4	uid_47	5 / 7	0.714286
103	AI_ELITE_4	uid_46	4 / 7	0.571429
104	AI_ELITE_4	uid_45	4 / 7	0.571429
105	AI_ELITE_4	uid_44	7 / 7	1.000000

```
df[df['Score']=='7 / 7'].head()
```

	Batch	User_ID	Score	score
2	AI_ELITE_7	uid_147	7 / 7	1.0
3	AI_ELITE_7	uid_146	7 / 7	1.0
5	AI_ELITE_7	uid_144	7 / 7	1.0
7	AI_ELITE_7	uid_142	7 / 7	1.0
15	AI_ELITE_7	uid_134	7 / 7	1.0

```
df[df['score']==1.0].head()
```

	Batch	User_ID	Score	score
2	AI_ELITE_7	uid_147	7 / 7	1.0
3	AI_ELITE_7	uid_146	7 / 7	1.0
5	AI_ELITE_7	uid_144	7 / 7	1.0
7	AI_ELITE_7	uid_142	7 / 7	1.0
15	AI_ELITE_7	uid_134	7 / 7	1.0

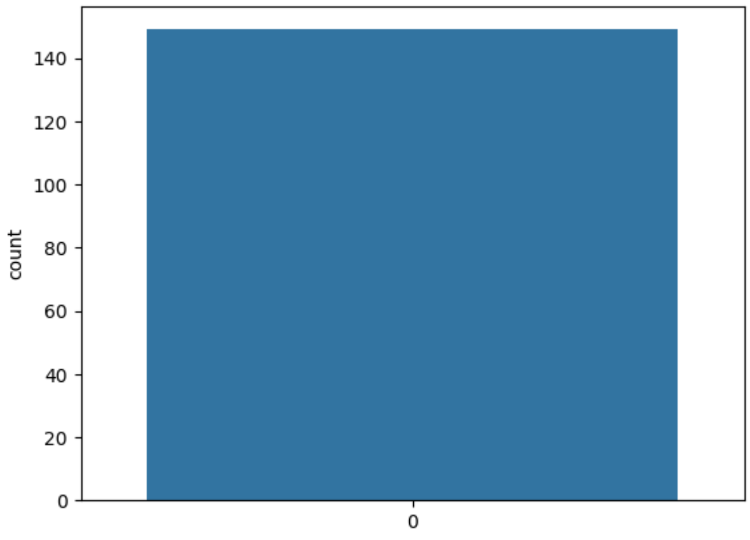
```
df[df['Score']=='1 / 7'].head()
```

	Batch	User_ID	Score	score
71	AI_ELITE_6	uid_78	1 / 7	0.142857
97	AI_ELITE_6	uid_52	1 / 7	0.142857
129	AI_ELITE_4	uid_20	1 / 7	0.142857

Count plot

```
sns.countplot(df['score'])
sns.countplot(df['score'])
```

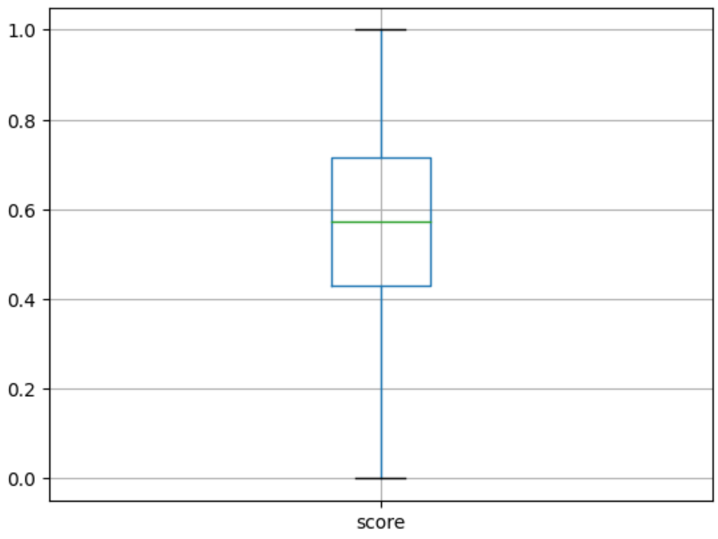
```
<Axes: ylabel='count'>
```



Boxplot

```
df[['score']].boxplot()
```

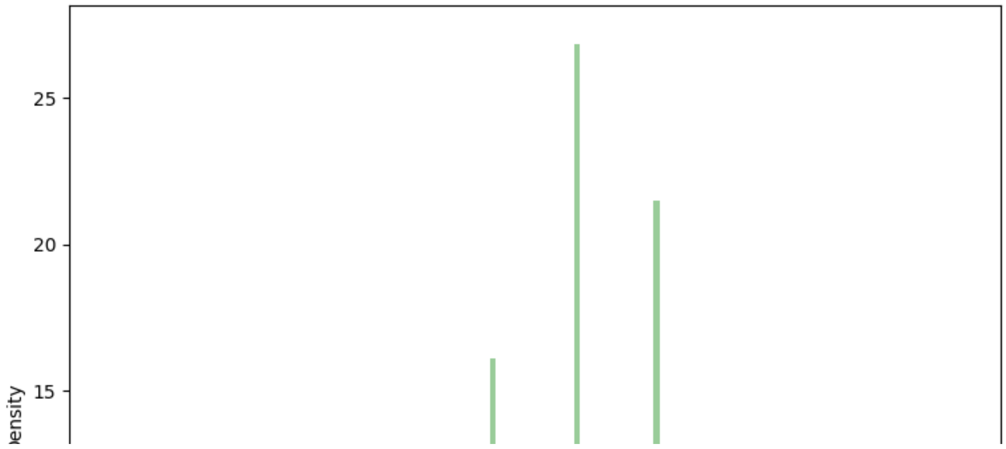
```
<Axes: >
```



distributionplot

```
print(df['score'].describe())
plt.figure(figsize=(9, 8))
sns.distplot(df['score'], color='g', bins=100, hist_kws={'alpha': 0.4});
```

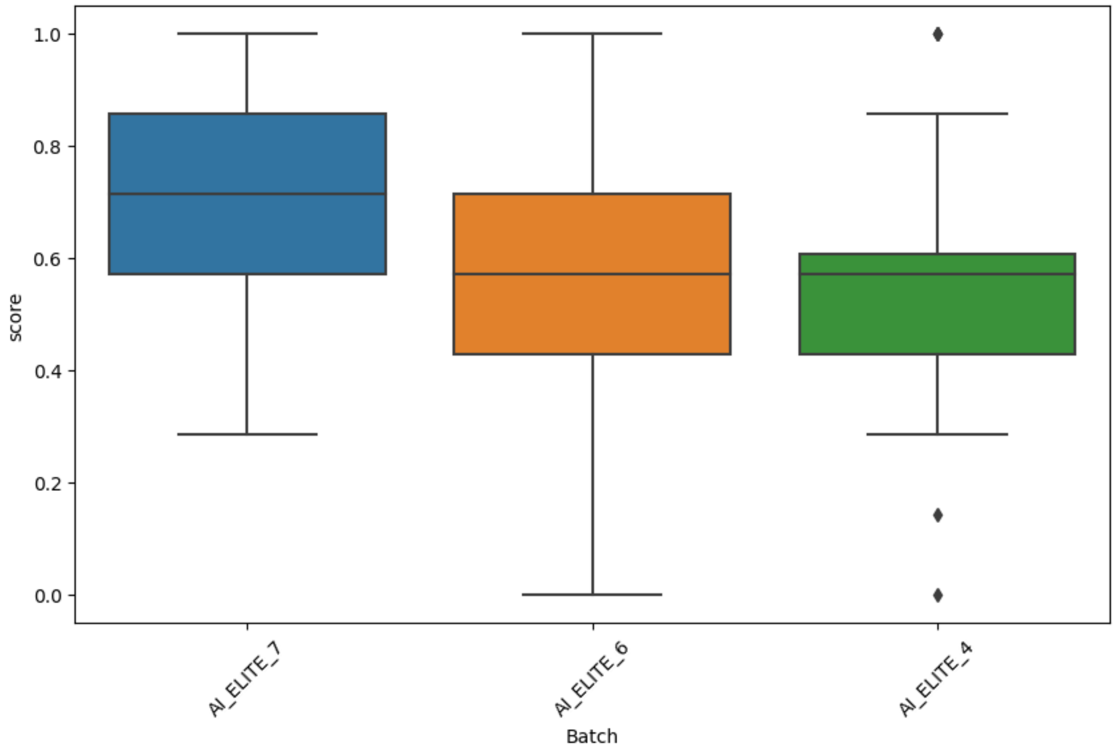
```
count    149.000000
mean       0.626079
std        0.227457
min        0.000000
25%        0.428571
50%        0.571429
75%        0.714286
max        1.000000
Name: score, dtype: float64
<ipython-input-151-76c0bb7edf3e>:3: UserWarning:

`distplot` is a deprecated function and will be removed in seaborn v0.14.0.

Please adapt your code to use either `displot` (a figure-level function with
similar flexibility) or `histplot` (an axes-level function for histograms).

For a guide to updating your code to use the new functions, please see
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751

  sns.distplot(df['score'], color='g', bins=100, hist_kws={'alpha': 0.4});
```



Boxplot

```
plt.figure(figsize = (10, 6))
ax = sns.boxplot(x='Batch', y='score', data=df)
plt.setp(ax.artists, alpha=.5, linewidth=2, edgecolor="k")
plt.xticks(rotation=45)
```

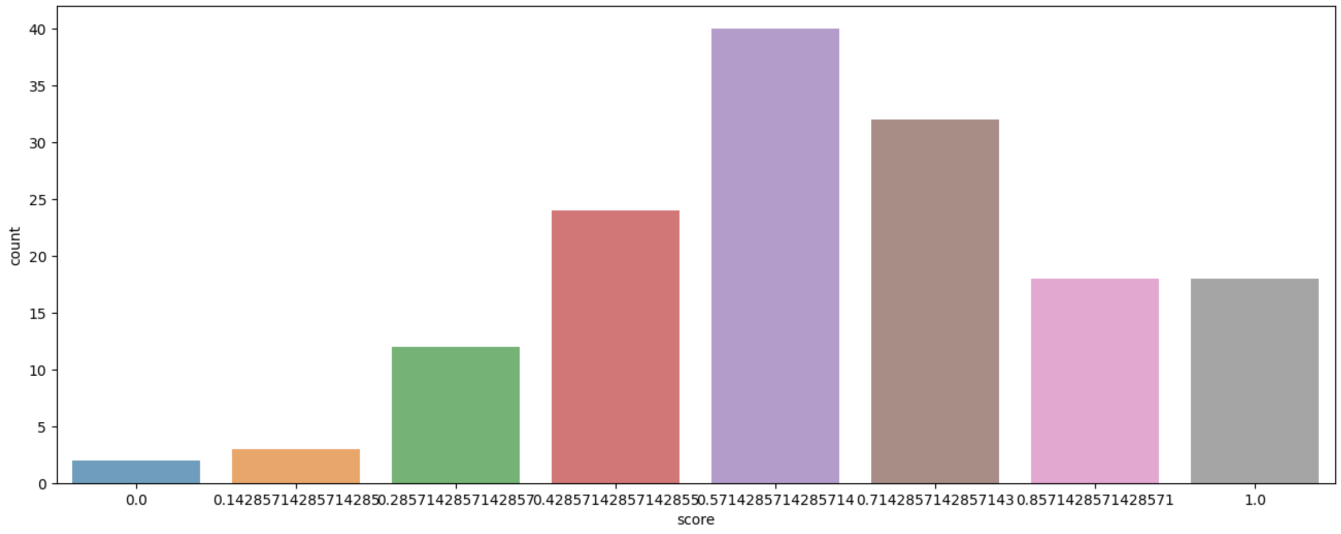
```
(array([0, 1, 2]),
 [Text(0, 0, 'AI_ELITE_7'),
  Text(1, 0, 'AI_ELITE_6'),
  Text(2, 0, 'AI_ELITE_4')])
```



Countplot

```
plt.figure(figsize = (16, 6))
sns.countplot(x=df['score'], alpha=0.7, data=df)
```

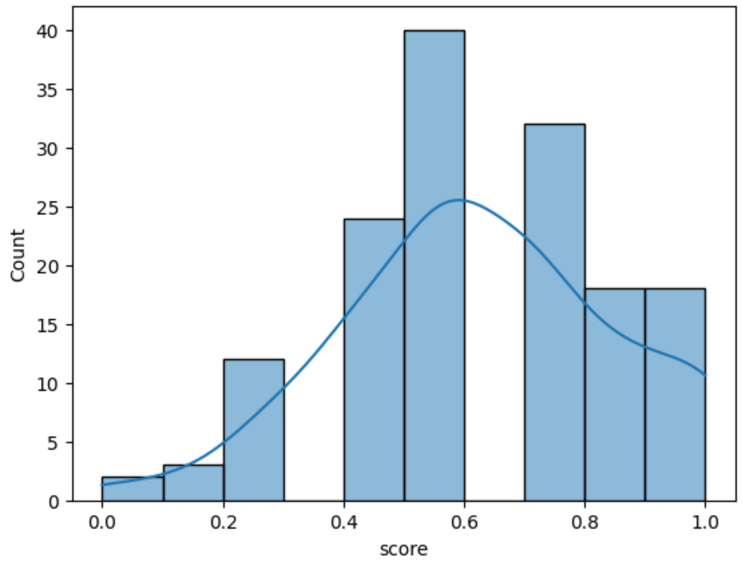
```
<Axes: xlabel='score', ylabel='count'>
```



Histplot

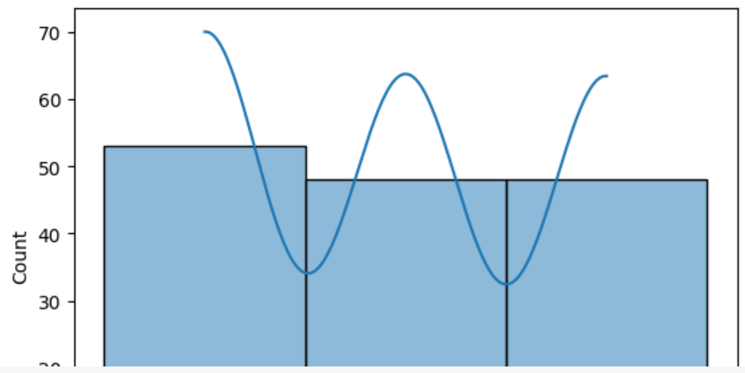
```
sns.histplot(df['score'],kde=True)
```

```
<Axes: xlabel='score', ylabel='Count'>
```



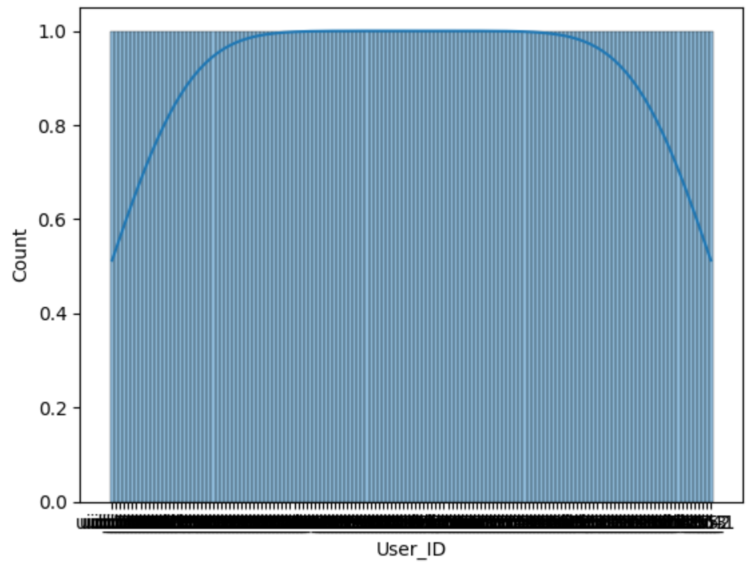
```
sns.histplot(df['Batch'],kde=True)
```

```
<Axes: xlabel='Batch', ylabel='Count'>
```



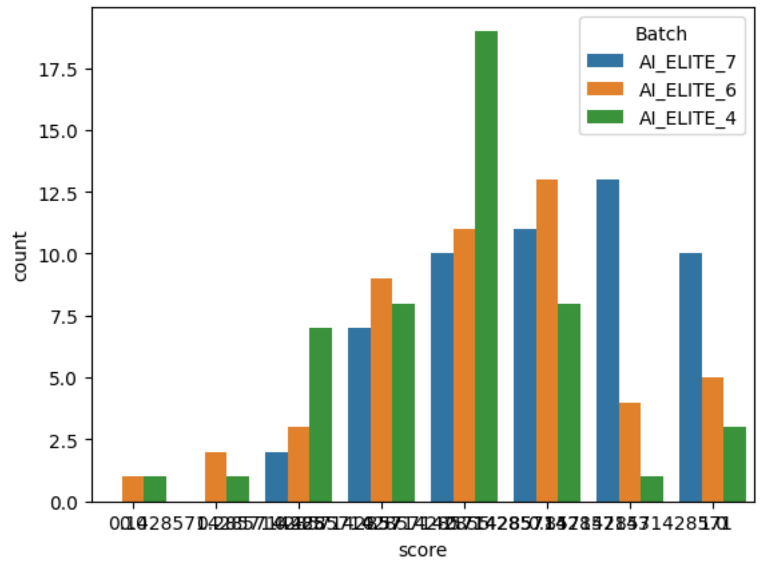
```
sns.histplot(df['User_ID'],kde=True)
```

```
<Axes: xlabel='User_ID', ylabel='Count'>
```



```
sns.countplot(data=df,x='score',hue="Batch")
```

```
<Axes: xlabel='score', ylabel='count'>
```



Correlation Plot

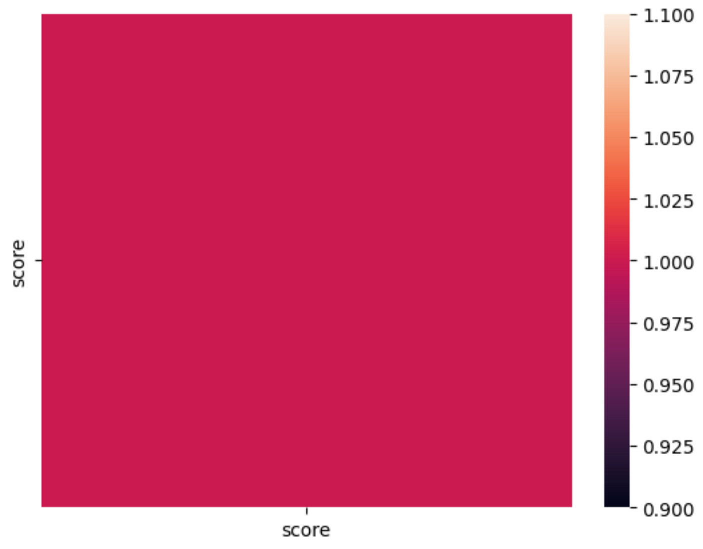
```
df.corr()
```

```
<ipython-input-145-2f6f6606aa2c>:1: FutureWarning: The default value of numeric_only in DataFrame.corr is deprecated. In a future v
  df.corr()
```

	score

```
sns.heatmap(df.corr())
```

```
<ipython-input-146-aa4f4450a243>:1: FutureWarning: The default value of numeric_only in DataFrame.corr is deprecated. In a future v
  sns.heatmap(df.corr())
<Axes: >
```



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