In [1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [2]:
```
df=pd.read_csv(r"C:\Users\Admin\Downloads\15_Horse Racing Results.csv - 15_Hors
df
```

Out[2]:

	Dato	Track	Race Number	Distance	Surface	Prize money	Starting position	Jockey	Jockey weight	Coun
0	03.09.2017	Sha Tin	10	1400	Gress	1310000	6	K C Leung	52	Sver
1	16.09.2017	Sha Tin	10	1400	Gress	1310000	14	C Y Ho	52	Sver
2	14.10.2017	Sha Tin	10	1400	Gress	1310000	8	C Y Ho	52	Sver
3	11.11.2017	Sha Tin	9	1600	Gress	1310000	13	Brett Prebble	54	Sver
4	26.11.2017	Sha Tin	9	1600	Gress	1310000	9	C Y Ho	52	Sver
...	...	...	...	...	...	...	...	...	...	...
27003	14.06.2020	Sha Tin	11	1200	Gress	1450000	6	A Hamelin	59	Austra
27004	21.06.2020	Sha Tin	2	1200	Gress	967000	7	K C Leung	57	Austra
27005	21.06.2020	Sha Tin	4	1200	Gress	967000	6	Blake Shinn	57	Austra
27006	21.06.2020	Sha Tin	5	1200	Gress	967000	14	Joao Moreira	57	N Zeala
27007	21.06.2020	Sha Tin	11	1200	Gress	1450000	7	C Schofield	55	N Zeala

27008 rows × 21 columns

In [3]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 27008 entries, 0 to 27007
Data columns (total 21 columns):
 #   Column             Non-Null Count  Dtype 
---  ------             --------------  ----- 
 0   Dato               27008 non-null  object
 1   Track              27008 non-null  object
 2   Race Number        27008 non-null  int64 
 3   Distance           27008 non-null  int64 
 4   Surface            27008 non-null  object
 5   Prize money        27008 non-null  int64 
 6   Starting position  27008 non-null  int64 
 7   Jockey             27008 non-null  object
 8   Jockey weight      27008 non-null  int64 
 9   Country            27008 non-null  object
 10  Horse age          27008 non-null  int64 
 11  TrainerName        27008 non-null  object
 12  Race time          27008 non-null  object
 13  Path               27008 non-null  int64 
 14  Final place        27008 non-null  int64 
 15  FGrating           27008 non-null  int64 
 16  Odds               27008 non-null  object
 17  RaceType           27008 non-null  object
 18  HorseId            27008 non-null  int64 
 19  JockeyId           27008 non-null  int64 
 20  TrainerID          27008 non-null  int64 
dtypes: int64(12), object(9)
memory usage: 4.3+ MB
```

In [4]:
```
df.describe()
```

Out[4]:

	Race Number	Distance	Prize money	Starting position	Jockey weight	Horse age	270
count	27008.000000	27008.000000	2.700800e+04	27008.000000	27008.000000	27008.000000	
mean	5.268624	1401.666173	1.479445e+06	6.741447	55.867373	5.246408	
std	2.780088	276.065045	2.162109e+06	3.691071	2.737006	1.519880	
min	1.000000	1000.000000	6.600000e+05	1.000000	47.000000	2.000000	
25%	3.000000	1200.000000	9.200000e+05	4.000000	54.000000	4.000000	
50%	5.000000	1400.000000	9.670000e+05	7.000000	56.000000	5.000000	
75%	8.000000	1650.000000	1.450000e+06	10.000000	58.000000	6.000000	
max	11.000000	2400.000000	2.800000e+07	14.000000	63.000000	12.000000	

In [5]:
```
df.columns
```

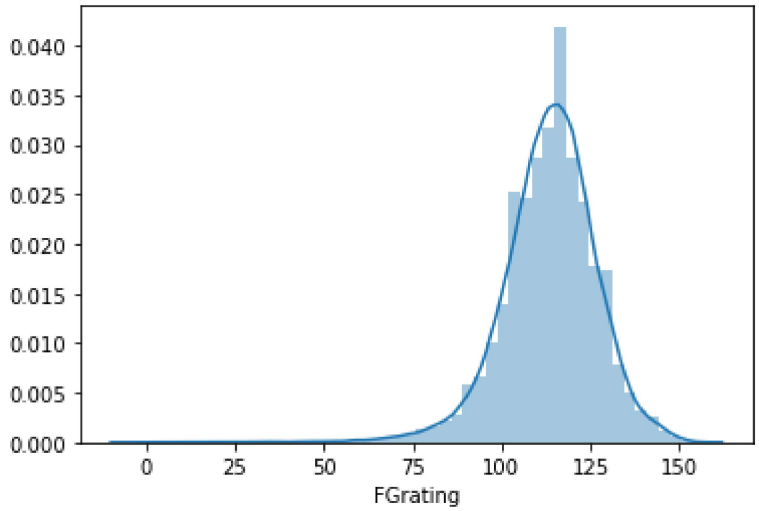
Out[5]:
```
Index(['Dato', 'Track', 'Race Number', 'Distance', 'Surface', 'Prize money',
       'Starting position', 'Jockey', 'Jockey weight', 'Country', 'Horse ag
e',
       'TrainerName', 'Race time', 'Path', 'Final place', 'FGrating', 'Odds',
       'RaceType', 'HorseId', 'JockeyId', 'TrainerID'],
      dtype='object')
```

In [6]:
```
sns.pairplot(df)
```

Out[6]:
```
<seaborn.axisgrid.PairGrid at 0x27373402be0>
```

In [7]:
```
sns.distplot(df['FGrating'])
```

Out[7]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x2737dc67fa0>
```



In [8]:
```
df1=df[[ 'Race Number', 'Distance','Prize money',
       'Starting position','Jockey weight','Horse age','Path', 'Final place', '
df1
```

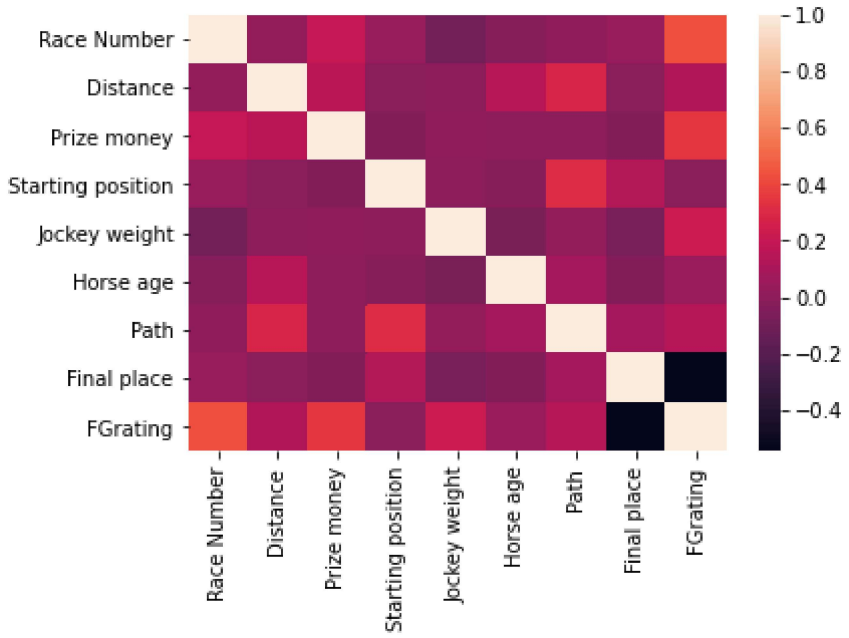
Out[8]:

	Race Number	Distance	Prize money	Starting position	Jockey weight	Horse age	Path	Final place	FGrating
0	10	1400	1310000	6	52	7	2	9	110
1	10	1400	1310000	14	52	7	3	4	124
2	10	1400	1310000	8	52	7	1	6	118
3	9	1600	1310000	13	54	7	0	8	107
4	9	1600	1310000	9	52	7	0	3	123
...	...	...	...	...	...	...	...	...	...
27003	11	1200	1450000	6	59	3	1	9	104
27004	2	1200	967000	7	57	3	2	5	110
27005	4	1200	967000	6	57	3	0	3	114
27006	5	1200	967000	14	57	3	2	7	109
27007	11	1200	1450000	7	55	4	2	9	118

27008 rows × 9 columns

In [9]:
```
sns.heatmap(df1.corr())
```

Out[9]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x2737efa8790>
```



In [10]:
```
x=df1[['Race Number', 'Distance','Prize money',
       'Starting position','Jockey weight','Horse age','Path', 'Final place']]
y=df1['FGrating']
```

In [11]:
```
from sklearn.model_selection import train_test_split
x_train,x_test,y_train,y_test = train_test_split(x,y,test_size=0.3)
```

In [12]:
```
from sklearn.linear_model import LinearRegression
lr= LinearRegression()
lr.fit(x_train,y_train)
```

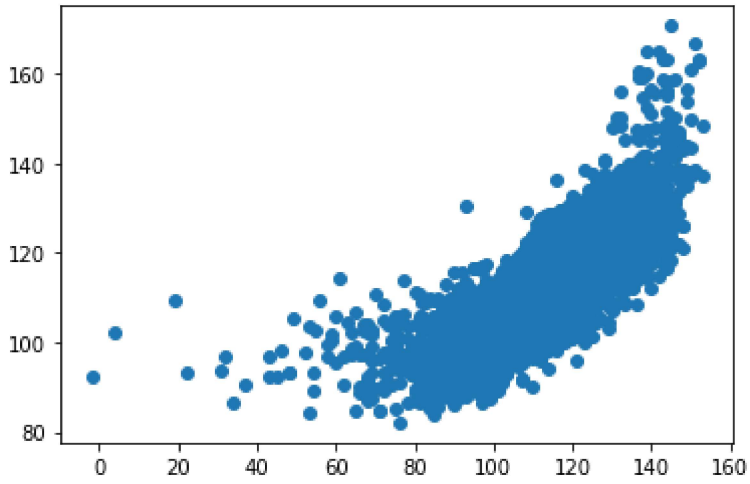
Out[12]:
```
LinearRegression()
```

In [13]:
```
print(lr.intercept_)
```

```
50.09380014414625
```

In [14]:
```
prediction= lr.predict(x_test)
plt.scatter(y_test,prediction)
```

Out[14]: <matplotlib.collections.PathCollection at 0x2737f8c7ee0>



In [15]:
```
print(lr.score(x_test,y_test))
```

```
0.6401059459858369
```

In [16]:
```
print(lr.score(x_train,y_train))
```

```
0.6381165242610176
```

In [17]:
```
from sklearn.linear_model import Ridge,Lasso
rr=Ridge(alpha=10)
rr.fit(x_train,y_train)
```

Out[17]: Ridge(alpha=10)

In [18]:
```
rr.score(x_test,y_test)
```

Out[18]: 0.6401059479503618

In [19]:
```
la=Lasso(alpha=10)
la.fit(x_train,y_train)
```

Out[19]: Lasso(alpha=10)

In [20]:
```
la.score(x_test,y_test)
```

Out[20]: 0.4436731927286366

In [21]:
```
from sklearn.linear_model import ElasticNet
en=ElasticNet()
en.fit(x_train,y_train)
```

Out[21]: ElasticNet()

In [22]:
```
print(en.intercept_)
```

```
58.654858153748435
```

In [23]:
```
print(en.predict(x_test))
```

```
[109.32662634 112.63024732 103.29569323 ... 107.4065346  128.12092574
  98.56528903]
```

In [24]:
```
print(en.score(x_test,y_test))
```

```
0.6336105767302014
```

Evaluation

In [25]:
```
from sklearn import metrics
```

In [26]:
```
print("Mean Absolute Error",metrics.mean_absolute_error(y_test,prediction))
```

```
Mean Absolute Error 5.58886193880459
```

In [27]:
```
print("Mean Squared Error",metrics.mean_squared_error(y_test,prediction))
```

```
Mean Squared Error 64.41669714314602
```

In [28]:
```
print("Root Mean Squared Error:",np.sqrt(metrics.mean_squared_error(y_test,prec
```

```
Root Mean Squared Error: 8.02600131716573
```

In [ ]:
```

```