In [1]:
```
#importing necessary libraries
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')
```

In [2]:
```
#loading dataset

df = pd.read_csv('data/houseprice.csv')

df.head()
```

Out[2]:

	bath	balcony	price	total_sqft_int	bhk	price_per_sqft	area_typeSuper built-up Area	area_typeBuilt-up Area	area_typePlot Area	availal
0	3.0	2.0	150.0	1672.0	3	8971.291866	1	0	0	
1	3.0	3.0	149.0	1750.0	3	8514.285714	0	1	0	
2	3.0	2.0	150.0	1750.0	3	8571.428571	1	0	0	
3	2.0	2.0	40.0	1250.0	2	3200.000000	1	0	0	
4	2.0	2.0	83.0	1200.0	2	6916.666667	0	0	1	

5 rows × 108 columns

In [3]:
```
df.shape
```

Out[3]:
```
(7120, 108)
```

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

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 7120 entries, 0 to 7119
Columns: 108 entries, bath to location_Tumkur Road
dtypes: float64(5), int64(103)
memory usage: 5.9 MB
```

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

Out[5]:
```
Index(['bath', 'balcony', 'price', 'total_sqft_int', 'bhk', 'price_per_sqft',
       'area_typeSuper built-up  Area', 'area_typeBuilt-up  Area',
       'area_typePlot  Area', 'availability_Ready To Move',
       ...
       'location_Kalena Agrahara', 'location_Horamavu Agara',
       'location_Vidyaranyapura', 'location_BTM 2nd Stage',
       'location_Hebbal Kempapura', 'location_Hosur Road',
       'location_Horamavu Banaswadi', 'location_Domlur',
       'location_Mahadevpura', 'location_Tumkur Road'],
      dtype='object', length=108)
```

In [6]:
```
#seperating features and target
X = df.drop('price', axis=1)
y = df['price']
```

In [7]:
```
#splitting dataset into training set and test set
from sklearn.model_selection import train_test_split

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=1)
```

In [8]:
```
#training model
from sklearn.tree import DecisionTreeRegressor

dct = DecisionTreeRegressor()
dct.fit(X_train, y_train)
```

Out[8]:
```
▾ DecisionTreeRegressor
DecisionTreeRegressor()
```

In [28]:
```
dct.get_depth()
```

Out[28]:
```
22
```

In [9]:
```
#model evaluation
y_pred = dct.predict(X_test)
```

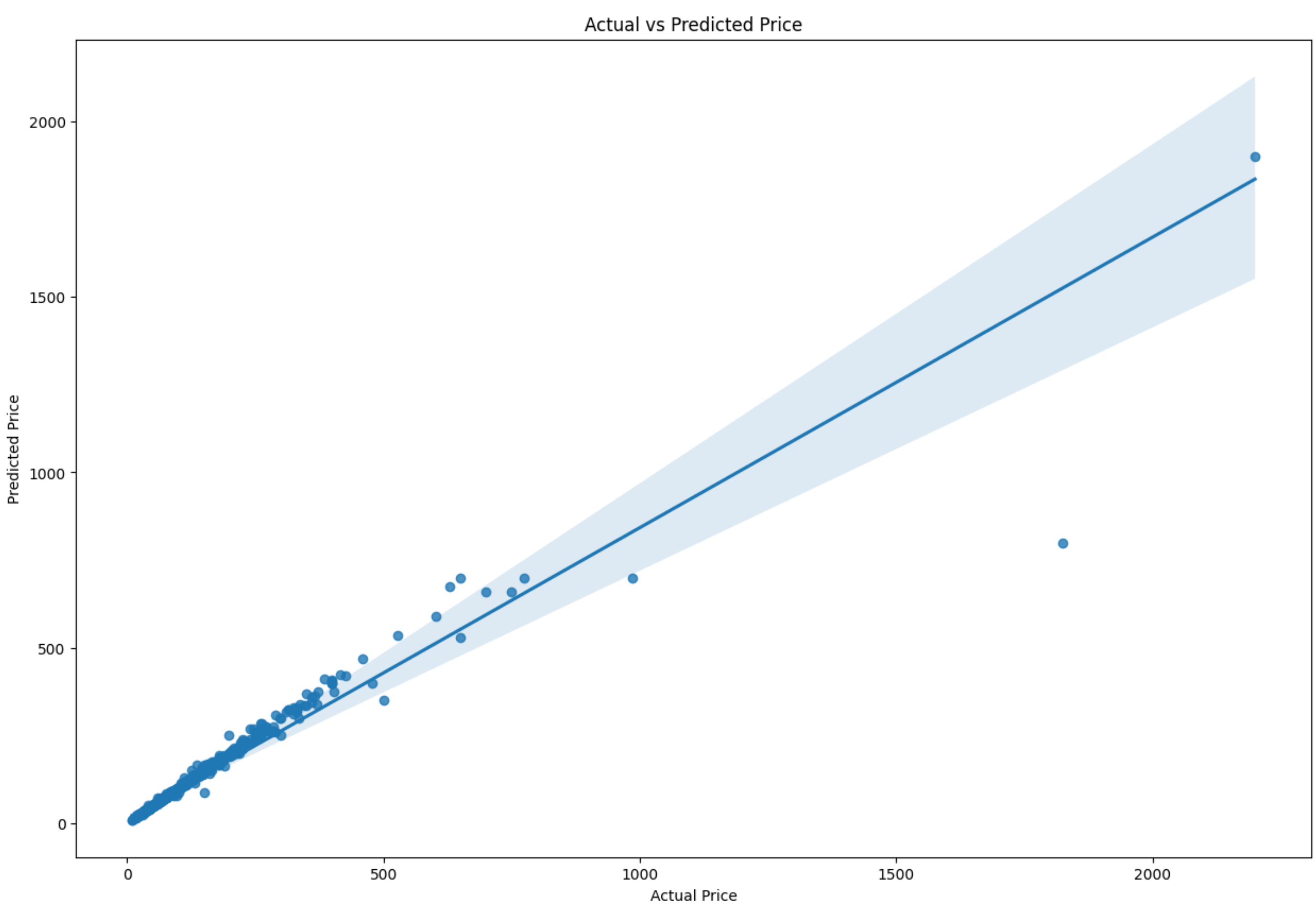
In [10]:
```
from sklearn.metrics import r2_score

r2_score(y_test, y_pred)
```

Out[10]:
```
0.9227936812841927
```

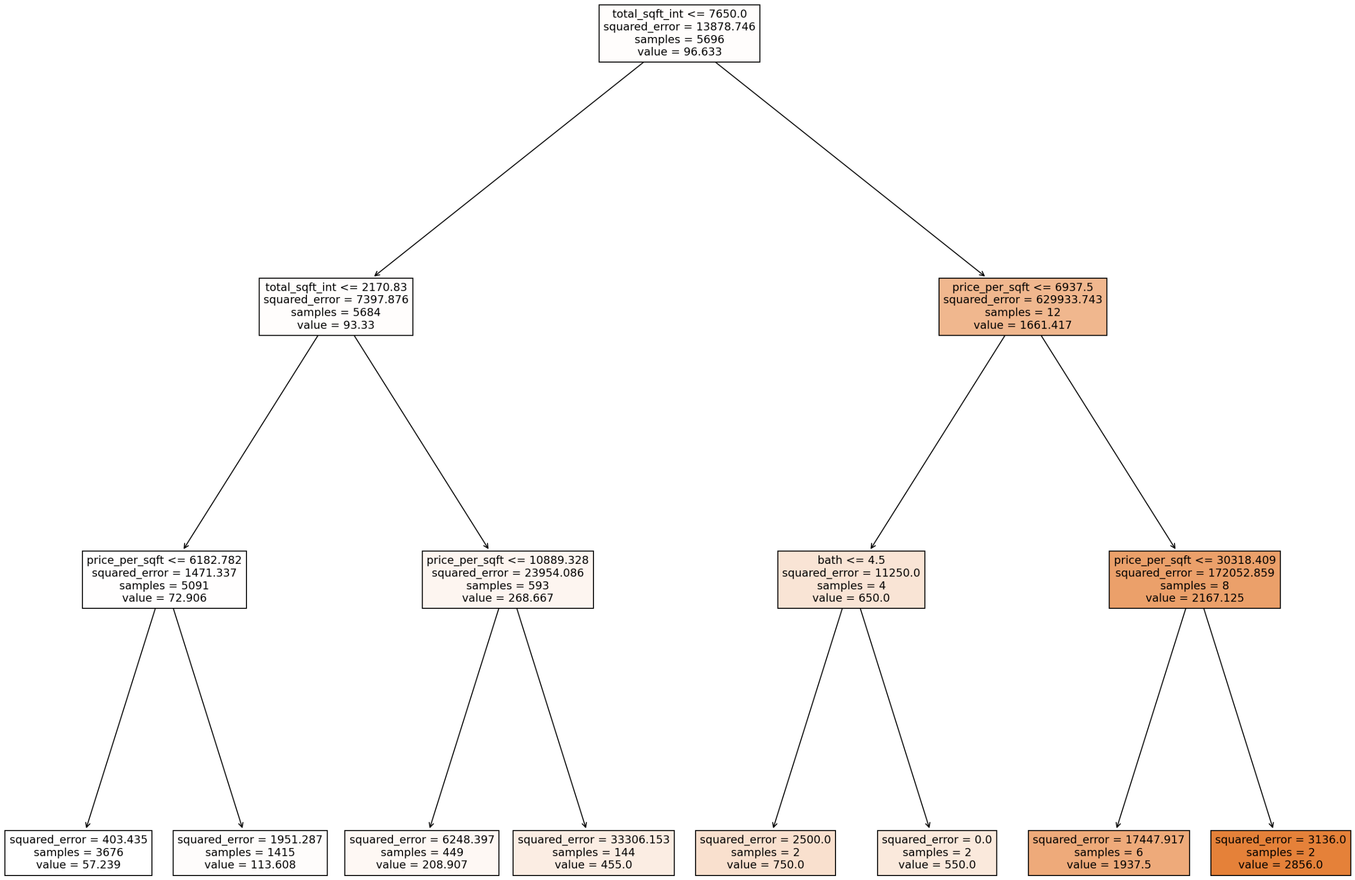
In [14]:
```
#plotting predicted values vs actual values

plt.figure(figsize=(15,10))
sns.regplot(x=y_test, y=y_pred)
plt.xlabel("Actual Price")
plt.ylabel('Predicted Price')
plt.title("Actual vs Predicted Price")
plt.show()
```



In [26]:
```
#visualizing decision tree with max_depth = 3
regressor = DecisionTreeRegressor(max_depth=3, random_state=1)
regressor.fit(X_train, y_train)
y_pred = regressor.predict(X_test)

r2_score(y_test, y_pred)
```
Out[26]:
```
0.7624851719489383
```
In [27]:
```
from sklearn.tree import plot_tree
plt.figure(figsize=(25,20), dpi=150)
plot_tree(regressor, feature_names=X_train.columns, filled=True)
```
Out[27]:
```
[Text(0.5, 0.875, 'total_sqft_int <= 7650.0\nsquared_error = 13878.746\nsamples = 5696\n
value = 96.633'),
 Text(0.25, 0.625, 'total_sqft_int <= 2170.83\nsquared_error = 7397.876\nsamples = 5684
\nvalue = 93.33'),
 Text(0.125, 0.375, 'price_per_sqft <= 6182.782\nsquared_error = 1471.337\nsamples = 509
1\nvalue = 72.906'),
 Text(0.0625, 0.125, 'squared_error = 403.435\nsamples = 3676\nvalue = 57.239'),
 Text(0.1875, 0.125, 'squared_error = 1951.287\nsamples = 1415\nvalue = 113.608'),
 Text(0.375, 0.375, 'price_per_sqft <= 10889.328\nsquared_error = 23954.086\nsamples = 5
93\nvalue = 268.667'),
 Text(0.3125, 0.125, 'squared_error = 6248.397\nsamples = 449\nvalue = 208.907'),
 Text(0.4375, 0.125, 'squared_error = 33306.153\nsamples = 144\nvalue = 455.0'),
 Text(0.75, 0.625, 'price_per_sqft <= 6937.5\nsquared_error = 629933.743\nsamples = 12\n
value = 1661.417'),
 Text(0.625, 0.375, 'bath <= 4.5\nsquared_error = 11250.0\nsamples = 4\nvalue = 650.0'),
 Text(0.5625, 0.125, 'squared_error = 2500.0\nsamples = 2\nvalue = 750.0'),
 Text(0.6875, 0.125, 'squared_error = 0.0\nsamples = 2\nvalue = 550.0'),
 Text(0.875, 0.375, 'price_per_sqft <= 30318.409\nsquared_error = 172052.859\nsamples =
8\nvalue = 2167.125'),
 Text(0.8125, 0.125, 'squared_error = 17447.917\nsamples = 6\nvalue = 1937.5'),
 Text(0.9375, 0.125, 'squared_error = 3136.0\nsamples = 2\nvalue = 2856.0')]
```



In [ ]:

```
!jupyter nbconvert --to webpdf --allow-chromium-download fuel_efficiency_prediction.ipyn
```