KNN

In [136]:

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

In [137]:

```
df=pd.read_csv('C:/Users/USER/Desktop/petrol_consumption.csv')
```

In [106]:

```
df.head()
```

Out[106]:

	Petrol_tax	Average_income	Paved_Highways	Population_Driver_licence(%)	Petrol_Consumpt
0	9.0	3571	1976	0.525	5
1	9.0	4092	1250	0.572	5
2	9.0	3865	1586	0.580	5
3	7.5	4870	2351	0.529	4
4	8.0	4399	431	0.544	4

In [105]:

```
df.shape
```

Out[105]:

```
(48, 6)
```

In [107]:

```
col_names = ['Petrol_tax','Average_income','Paved_Highways','Population_Driver_licence(%)',

df.columns = col_names

df.columns
```

Out[107]:

```
Index(['Petrol_tax', 'Average_income', 'Paved_Highways',
       'Population_Driver_licence(%)', 'Petrol_Consumption', 'target'],
      dtype='object')
```

In [108]:

```
for var in df.columns:

    print(df[var].value_counts())
```

```
7.00     19
8.00     10
9.00      8
7.50      4
8.50      3
10.00     1
6.58      1
5.00      1
6.00      1
Name: Petrol_tax, dtype: int64
5126    2
3571    1
4045    1
3846    1
4188    1
3601    1
3640    1
3333    1
3063    1
```

In [109]:

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

Out[109]:

```
Petrol_tax                      0
Average_income                  0
Paved_Highways                  0
Population_Driver_licence(%)    0
Petrol_Consumption              0
target                          0
dtype: int64
```

In [110]:

```
df.isna().sum()
```

Out[110]:

```
Petrol_tax                      0
Average_income                  0
Paved_Highways                  0
Population_Driver_licence(%)    0
Petrol_Consumption              0
target                          0
dtype: int64
```

In [114]:

```
df['target'].value_counts()
```

Out[114]:

```
1    28
0    20
Name: target, dtype: int64
```

In [115]:

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

Out[115]:

```
array([1, 0], dtype=int64)
```

In [116]:

```
df['target'].isna().sum()
```

Out[116]:

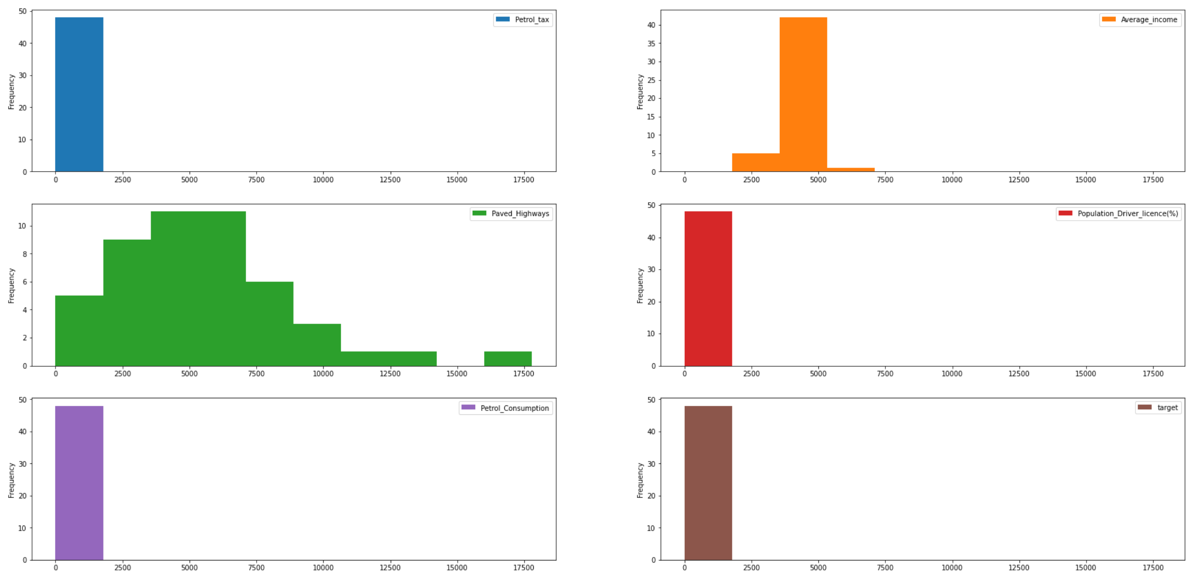
```
0
```

In [117]:

```
plt.rcParams['figure.figsize']=(30,25)

df.plot(kind='hist', bins=10, subplots=True, layout=(5,2), sharex=False, sharey=False)

plt.show()
```



In [118]:

```
X = df.drop(['target'], axis=1)

y = df['target']
```

In [119]:

```
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 = 0
```

In [120]:

```
X_train.shape, X_test.shape
```

Out[120]:

```
((38, 5), (10, 5))
```

In [121]:

```
cols = X_train.columns
```

In [122]:

```
from sklearn.preprocessing import StandardScaler

scaler = StandardScaler()

X_train = scaler.fit_transform(X_train)

X_test = scaler.transform(X_test)
```

In [123]:

```
X_train = pd.DataFrame(X_train, columns=[cols])
```

In [124]:

```
X_test = pd.DataFrame(X_test, columns=[cols])
```

In [125]:

```
X_train.head()
```

Out[125]:

	Petrol_tax	Average_income	Paved_Highways	Population_Driver_licence(%)	Petrol_Consumpt
0	-0.132526	1.505774	2.258546	-0.915791	-0.965
1	-0.628193	-1.833670	0.212334	-1.128527	-0.256
2	-0.132526	-1.788970	-0.454195	-0.525775	0.376
3	-0.132526	-0.878213	0.877245	0.041521	0.401
4	-0.628193	1.274825	1.074805	0.289713	-0.512

In [126]:

```
from sklearn.neighbors import KNeighborsClassifier
```

In [127]:

```
knn = KNeighborsClassifier(n_neighbors=3)
```

In [128]:

```
knn.fit(X_train, y_train)
KNeighborsClassifier(algorithm='auto', leaf_size=30, metric='minkowski',
                     metric_params=None, n_jobs=None, n_neighbors=3, p=2,
                     weights='uniform')
```

Out[128]:

```
KNeighborsClassifier(n_neighbors=3)
```

In [131]:

```
y_pred = knn.predict(X_test)

y_pred
```

Out[131]:

```
array([1, 0, 0, 0, 0, 1, 1, 0, 0, 0], dtype=int64)
```

In [132]:

```
knn.predict_proba(X_test)[:,0]
```

Out[132]:

```
array([0.33333333, 1.        , 0.66666667, 0.66666667, 0.66666667,
       0.        , 0.33333333, 1.        , 0.66666667, 0.66666667])
```

In [134]:

```
from sklearn.metrics import accuracy_score

print('Model accuracy score: {0:0.2f}'. format(accuracy_score(y_test, y_pred)))
```

```
Model accuracy score: 0.40
```

In [ ]:

```

```