In [2]:

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

df = pd.read_csv('train.csv')
# df = df.iloc[:,:-1]
df.shape
```

Out[2]:

```
(8, 2)
```

In [3]:

```
df.head()
```

Out[3]:

	Hours	Risk Score
0	10	95
1	9	80
2	2	10
3	15	50
4	10	45

In [4]:

```
df.describe()
```

Out[4]:

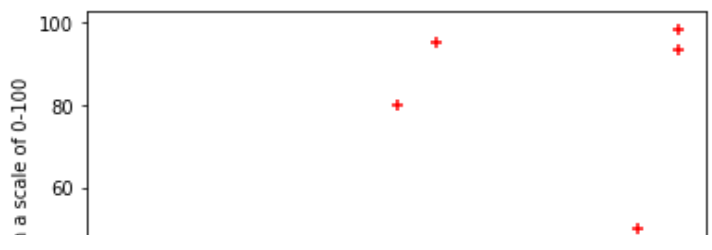
	Hours	Risk Score
count	8.000000	8.000000
mean	11.125000	63.625000
std	4.673252	32.429869
min	2.000000	10.000000
25%	9.750000	43.250000
50%	10.500000	65.000000
75%	15.250000	93.500000
max	16.000000	98.000000

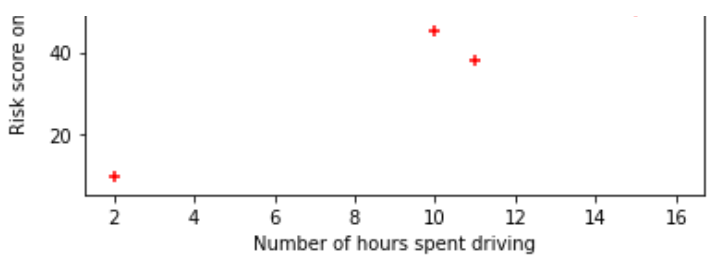
In [6]:

```
plt.scatter(df['Hours'],df['Risk Score'],color="red", marker = "+")
plt.xlabel('Number of hours spent driving')
plt.ylabel('Risk score on a scale of 0-100')
```

Out[6]:

```
Text(0, 0.5, 'Risk score on a scale of 0-100')
```





In [7]:

```
x = df.iloc[:,:-1].values
y = df.iloc[:, 1].values
x.shape
```

Out[7]:

```
(8, 1)
```

In [8]:

```
x
```

Out[8]:

```
array([[10],
       [ 9],
       [ 2],
       [15],
       [10],
       [16],
       [11],
       [16]])
```

In [9]:

```
y
```

Out[9]:

```
array([95, 80, 10, 50, 45, 98, 38, 93])
```

In [15]:

```
from sklearn.linear_model import LinearRegression

lr = LinearRegression()
lr.fit(x,y)
```

Out[15]:

```
LinearRegression()
```

In [16]:

```
y_pred = lr.predict(x)
y_pred
```

Out[16]:

```
array([58.46361406, 53.87571545, 21.76042518, 81.40310711, 58.46361406,
       85.99100572, 63.05151267, 85.99100572])
```

In [17]:

```
from sklearn.metrics import mean_squared_error, r2_score

r2 = r2_score(y, y_pred)
print(r2)
```

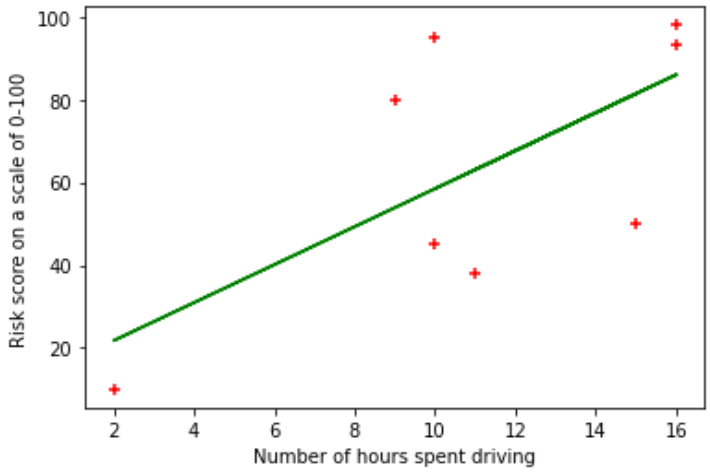
```
0.43709481451010035
```

In [27]:

```
plt.scatter(x,y,color="red", marker="+")
plt.plot(x,y_pred,color="green")
plt.xlabel('Number of hours spent driving')
plt.ylabel('Risk score on a scale of 0-100')
```

Out[27]:

```
Text(0, 0.5, 'Risk score on a scale of 0-100')
```



In [28]:

```
print("Coefficients-")
print('Intercept (b0) :', lr.intercept_)
print('Slope (b1) :' ,lr.coef_)
```

```
Coefficients-
Intercept (b0) : 12.584627964022907
Slope (b1) : [4.58789861]
```

Without using sklearn

By using Least Square method y_pred = b0 + b1*x

In [41]:

```
x_mean,y_mean = np.mean(x),np.mean(y)
```

In [42]:

```
n=0
d=0
for i in range(0,8):
    n+=((x[i][0]-x_mean)*(y[i]-y_mean))
    d+=(x[i][0]-x_mean)**2
```

In [43]:

```
b1 = n/d
b0 = y_mean-b1*x_mean
```

In [44]:

```
print("Intercept (b0) = {} \nSlope (b1) = {}".format(b0,b1))
```

```
Intercept (b0) = 12.584627964022893
Slope (b1) = 4.58789860997547
```

In [45]:

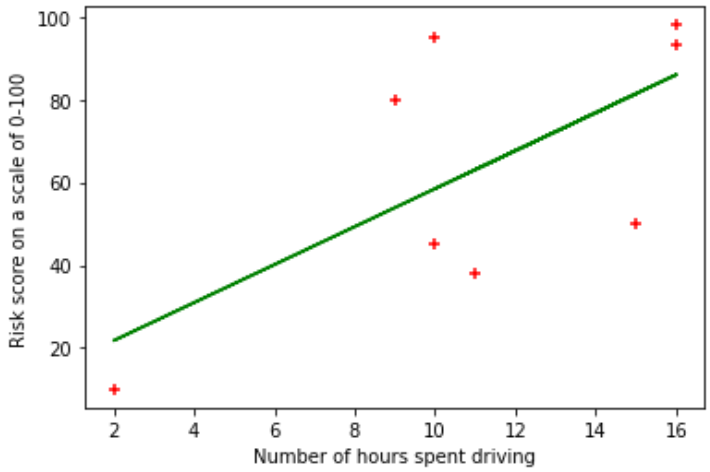
```
plt.scatter(x,y, color="red", marker="+")
y_pred = b0+b1*x

plt.plot(x,y_pred, color="green")
```

```
plt.xlabel('Number of hours spent driving')
plt.ylabel('Risk score on a scale of 0-100')
```

Out[45]:

```
Text(0, 0.5, 'Risk score on a scale of 0-100')
```



In [ ]:

```
```