Random Forest Classification

Importing the libraries

In [1]:

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

Importing the dataset

In [2]:

```
dataset = pd.read_csv('Social_Network_Ads.csv')
X = dataset.iloc[:, :-1].values
y = dataset.iloc[:, -1].values
```

Splitting the dataset into the Training set and Test set

In [3]:

```
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 [4]:

```
X_train.shape
```

Out[4]:

```
(280, 2)
```

In [5]:

```
y_train.shape
```

Out[5]:

```
(280,)
```

In [6]:

```
X_test.shape
```

Out[6]:

```
(120, 2)
```

In [7]:

```
y_test.shape
```

Out[7]:

```
(120,)
```

Feature Scaling

In [8]:

```
from sklearn.preprocessing import StandardScaler
sc = StandardScaler()
X_train = sc.fit_transform(X_train)
X_test = sc.transform(X_test)
```

In [9]:
```
print(X_train)
```

```
[[-1.1631724  -1.5849703 ]
 [ 2.17018137  0.93098672]
 [ 0.0133054   1.22017719]
 [ 0.20938504  1.07558195]
 [ 0.40546467 -0.48604654]
 [-0.28081405 -0.31253226]
 [ 0.99370357 -0.8330751 ]
 [ 0.99370357  1.8563962 ]
 [ 0.0133054   1.24909623]
 [-0.86905295  2.26126285]
 [-1.1631724  -1.5849703 ]
 [ 2.17018137 -0.80415605]
 [-1.35925203 -1.46929411]
 [ 0.40546467  2.2901819 ]
 [ 0.79762394  0.75747245]
 [-0.96709276 -0.31253226]
 [ 0.11134522  0.75747245]
 [-0.96709276  0.55503912]
 [ 0.30742485  0.06341534]
```

In [10]:
```
print(X_test)
```

```
 [-0.28081405 -0.65956082]
 [ 0.89566375  2.14558666]
 [ 0.30742485 -0.54388463]
 [ 0.89566375  1.01774386]
 [-1.45729185 -1.2090227 ]
 [ 1.09174339  2.05882953]
 [-0.96709276  0.49720103]
 [-0.86905295  0.29476771]
 [-0.08473441 -0.22577513]
 [-0.5749335   0.46828198]
 [-1.65337148  0.52612008]
 [-0.08473441  0.26584866]
 [ 1.87606192 -0.28361322]
 [-0.08473441 -0.48604654]
 [-1.35925203 -0.34145131]
 [-1.94749093 -0.51496559]
 [-1.55533166  0.32368675]
 [-0.37885386 -0.775237  ]
 [-0.67297331 -1.03550842]
 [ 1.09174339 -0.97767033]
```

Training the Random Forest Classification model on the Training set

In [11]:

```
from sklearn.ensemble import RandomForestClassifier
classifier = RandomForestClassifier(n_estimators = 20, criterion = 'entrop
classifier.fit(X_train, y_train)
```

Out[11]:

```
RandomForestClassifier(criterion='entropy', n_estimators=20, random_state
=0)
```

In a Jupyter environment, please rerun this cell to show the HTML representation or trust the notebook.
On GitHub, the HTML representation is unable to render, please try loading this page with nbviewer.org.

Predicting a new result

In [1]:

```
print(classifier.predict([[32,150000]]))
```

```
---------------------------------------------------------------------------
--
NameError                                 Traceback (most recent call las
t)
<ipython-input-1-aa17d0668897> in <module>
----> 1 print(classifier.predict([[32,150000]]))

NameError: name 'classifier' is not defined
```

Predicting the Test set results

In [13]:

```
y_pred = classifier.predict(X_test)
#print(np.concatenate((y_pred.reshape(len(y_pred),1), y_test.reshape(len(y
```

Making the Confusion Matrix

In [14]:

```
from sklearn.metrics import confusion_matrix, accuracy_score
cm = confusion_matrix(y_test, y_pred)
print(cm)
accuracy_score(y_test, y_pred)
```

```
[[74  5]
 [ 5 36]]
```

Out[14]:

```
0.9166666666666666
```

Visualising the Training set results

In [15]:

```
from matplotlib.colors import ListedColormap
X_set, y_set = sc.inverse_transform(X_train), y_train
X1, X2 = np.meshgrid(np.arange(start = X_set[:, 0].min() - 10, stop = X_se
                     np.arange(start = X_set[:, 1].min() - 1000, stop = X_
plt.contourf(X1, X2, classifier.predict(sc.transform(np.array([X1.ravel(),
             alpha = 0.75, cmap = ListedColormap(('red', 'green')))
plt.xlim(X1.min(), X1.max())
plt.ylim(X2.min(), X2.max())
for i, j in enumerate(np.unique(y_set)):
    plt.scatter(X_set[y_set == j, 0], X_set[y_set == j, 1], c = ListedColo
plt.title('Random Forest Classification (Training set)')
plt.xlabel('Age')
plt.ylabel('Estimated Salary')
plt.legend()
plt.show()
```

```
*c* argument looks like a single numeric RGB or RGBA sequence, which shou
ld be avoided as value-mapping will have precedence in case its length ma
tches with *x* & *y*.  Please use the *color* keyword-argument or provide
a 2D array with a single row if you intend to specify the same RGB or RGB
A value for all points.
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tches with *x* & *y*.  Please use the *color* keyword-argument or provide
a 2D array with a single row if you intend to specify the same RGB or RGB
A value for all points.
```

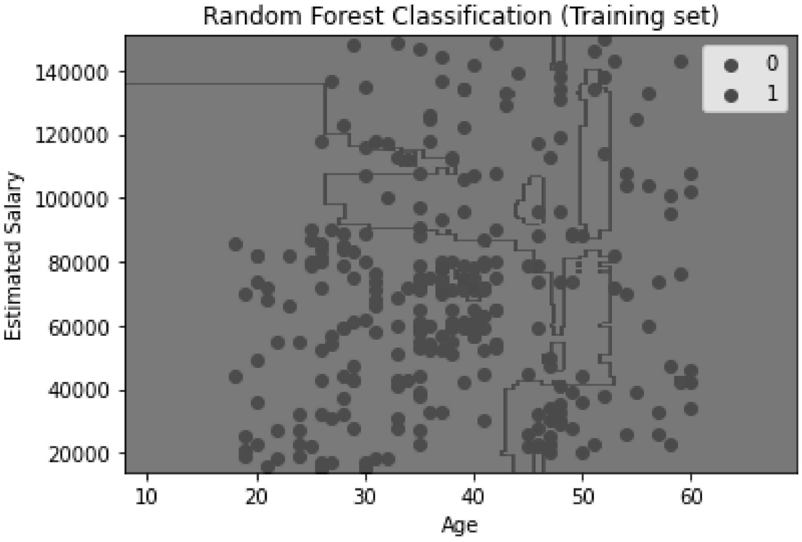

Visualising the Test set results

In [ ]:

```
from matplotlib.colors import ListedColormap
X_set, y_set = sc.inverse_transform(X_test), y_test
X1, X2 = np.meshgrid(np.arange(start = X_set[:, 0].min() - 10, stop = X_se
                     np.arange(start = X_set[:, 1].min() - 1000, stop = X_
plt.contourf(X1, X2, classifier.predict(sc.transform(np.array([X1.ravel(),
             alpha = 0.75, cmap = ListedColormap(('red', 'green')))
plt.xlim(X1.min(), X1.max())
plt.ylim(X2.min(), X2.max())
for i, j in enumerate(np.unique(y_set)):
    plt.scatter(X_set[y_set == j, 0], X_set[y_set == j, 1], c = ListedColo
plt.title('Random Forest Classification (Test set)')
plt.xlabel('Age')
plt.ylabel('Estimated Salary')
plt.legend()
plt.show()
```

In [ ]: