

IE 345 - K “Introduction to Deep Learning: Fundamentals Concepts”

Prof. Yuzo

Decision Tree Classification

pg. 90 - 93

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

```
In [2]: dataset = pd.read_csv('Social_Network_Ads.csv')
x = dataset.iloc[:, [2, 3]].values
y = dataset.iloc[:, 4].values
dataset.head(10)
```

```
Out[2]:
```

	User ID	Gender	Age	EstimatedSalary	Purchased
0	15624510	Male	19	19000	0
1	15810944	Male	35	20000	0
2	15668575	Female	26	43000	0
3	15603246	Female	27	57000	0
4	15804002	Male	19	76000	0
5	15728773	Male	27	58000	0
6	15598044	Female	27	84000	0
7	15694829	Female	32	150000	1
8	15600575	Male	25	33000	0
9	15727311	Female	35	65000	0

```
In [3]: # Splitting the dataset into the training 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=0.25, random_state=0)
```

```
In [4]: # Feature Scaling
from sklearn.preprocessing import StandardScaler
sc = StandardScaler()
x_train = sc.fit_transform(x_train)
x_test = sc.transform(x_test)

# Fitting Decision Tree Classification to the Training set
from sklearn.tree import DecisionTreeClassifier
classifier = DecisionTreeClassifier(criterion = 'entropy', random_state = 0)
classifier.fit(x_train, y_train)

# Predicting the Test set result
y_pred = classifier.predict(x_test)
```

```
C:\Users\pablo\Python\envs\DAVID\lib\site-packages\sklearn\utils\validation.py:595: Data
ConversionWarning: Data with input dtype int64 was converted to float64 by StandardScale
r.
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```

```
In [5]: # Making the Confusion Matrix
from sklearn.metrics import confusion_matrix
cm = confusion_matrix(y_test, y_pred)
```

```

In [6]: # Visualising the Training set result
from matplotlib.colors import ListedColormap
x_set, y_set = x_train, y_train
X1, X2 = np.meshgrid(np.arange(start=x_set[:,0].min() - 1,
                                stop=x_set[:,0].max() + 1,
                                step = 0.01),
                    np.arange(start=x_set[:,1].min() - 1,
                                stop=x_set[:,1].max() + 1,
                                step = 0.01))

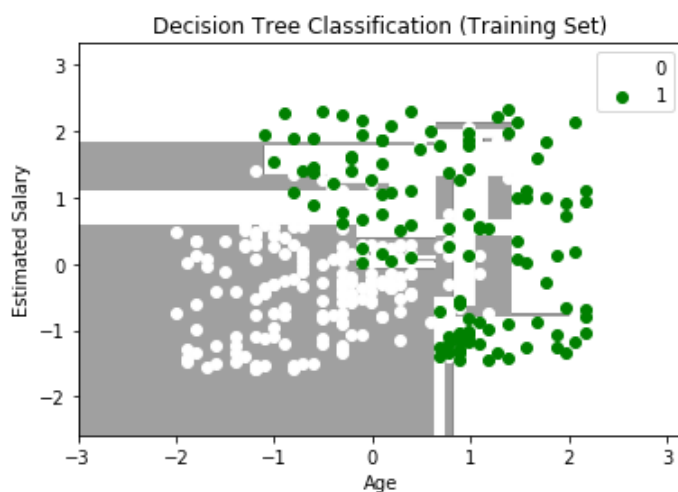
plt.contourf(X1, X2, classifier.predict(np.array([X1.ravel(),X2.ravel()]).T).reshape(X1.shape),
             alpha = 0.75, cmap = ListedColormap(('gray', 'white')))
plt.xlim(X1.min(), X1.max())
plt.ylim(X2.min(), X2.max())

for i, j in enumerate(np.unique(y_set)):
    plt.scatter(x_set[y_set == j,0], x_set[y_set == j,1],
               c = ListedColormap(('white', 'green'))(i), label = j)
plt.title('Decision Tree 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 should be avoided as a value-mapping will have precedence in case its length matches with 'x' & 'y'. Please use a 2-D array with a single row if you really want to specify the same RGB or RGBA value for all points.

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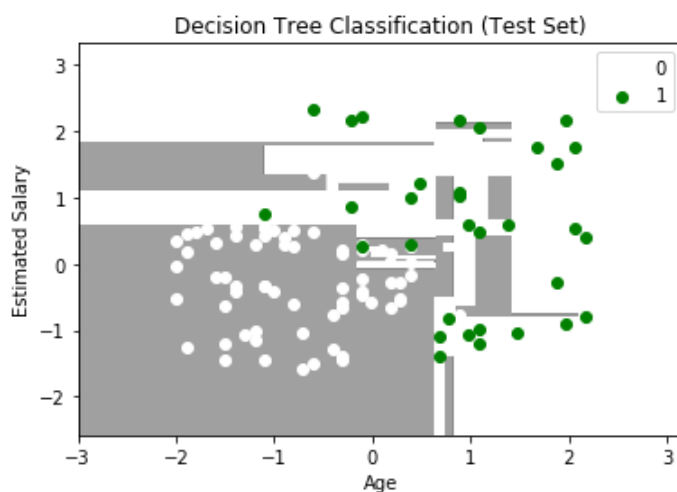
```
In [7]: # Visualising the Test set result
x_set, y_set = x_test, y_test
X1, X2 = np.meshgrid(np.arange(start=x_set[:,0].min() - 1,
                                stop=x_set[:,0].max() + 1,
                                step = 0.01),
                    np.arange(start=x_set[:,1].min() - 1,
                                stop=x_set[:,1].max() + 1,
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plt.contourf(X1, X2, classifier.predict(np.array([X1.ravel(),X2.ravel()]).T).reshape(X1.shape),
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for i, j in enumerate(np.unique(y_set)):
    plt.scatter(x_set[y_set == j,0], x_set[y_set == j,1],
               c = ListedColormap(('white', 'green'))(i), label = j)
plt.title('Decision Tree Classification (Test Set)')
plt.xlabel('Age')
plt.ylabel('Estimated Salary')
plt.legend()
plt.show()
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