In [11]:
```
# Decision Tree CLassifier

# Importing the libraries

import numpy as np
import matplotlib.pyplot as plt
import pandas as pd
from sklearn import metrics
```

In [12]:
```
# Importing the datasets

datasets = pd.read_csv('Social_Network_Ads.csv')
#feature_cols = ['Age', 'EstimatedSalary']
X = datasets.iloc[:, [2,3]].values
Y = datasets.iloc[:, 4].values
```

In [13]:
```
# Splitting the dataset into the 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 = 0.25, random_state = 0)
```

In [14]:
```
# Feature Scaling

from sklearn.preprocessing import StandardScaler
sc_X = StandardScaler()
X_Train = sc_X.fit_transform(X_Train)
X_Test = sc_X.transform(X_Test)
```

In [15]:
```
# Fitting the classifier into the Training set

from sklearn.tree import DecisionTreeClassifier
classifier = DecisionTreeClassifier(criterion = 'entropy', max_depth=3)

classifier.fit(X_Train, Y_Train)
```

Out[15]:
```
DecisionTreeClassifier(criterion='entropy', max_depth=3)
```

In [16]:
```
# Predicting the test set results

Y_Pred = classifier.predict(X_Test)


# Model Accuracy, how often is the classifier correct?
print("Accuracy:",metrics.accuracy_score(Y_Test, Y_Pred))
```

```
Accuracy: 0.94
```

In [17]:
```
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(('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 = ListedColormap(('red', 'green'))(i), label = j)
plt.title('Decision Tree Classifier (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 value-mapping will have precedence in case its length matches with *
x* & *y*.  Please use the *color* keyword-argument or provide a 2-D array with a single row if you intend to specify the same RGB or RGBA value for all point
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*c* argument looks like a single numeric RGB or RGBA sequence, which should be avoided as value-mapping will have precedence in case its length matches with *
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s.
```

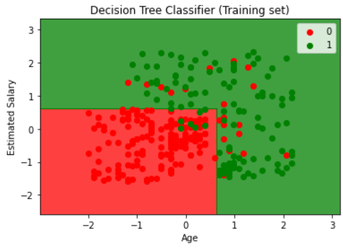

In [18]:
```
# Visualising the Test set results

from matplotlib.colors import ListedColormap
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, step = 0.01))
plt.contourf(X1, X2, classifier.predict(np.array([X1.ravel(), X2.ravel()]).T).reshape(X1.shape),
             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 = ListedColormap(('red', 'green'))(i), label = j)
plt.title('Decision Tree Classifier (Test 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 value-mapping will have precedence in case its length matches with *
x* & *y*.  Please use the *color* keyword-argument or provide a 2-D array with a single row if you intend to specify the same RGB or RGBA value for all point
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*c* argument looks like a single numeric RGB or RGBA sequence, which should be avoided as value-mapping will have precedence in case its length matches with *
x* & *y*.  Please use the *color* keyword-argument or provide a 2-D array with a single row if you intend to specify the same RGB or RGBA value for all point
s.
```

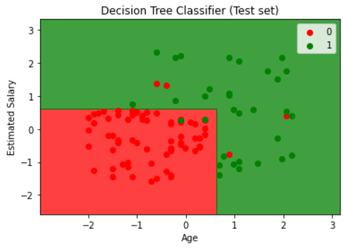

In [19]:
```
accuracy = metrics.accuracy_score(Y_Test,Y_Pred)
report = metrics.classification_report(Y_Pred, Y_Test)
cm = metrics.confusion_matrix(Y_Test, Y_Pred)

print("Classification report:")
print("Accuracy: ", accuracy)
print(report)
print("Confusion matrix:")
print(cm)
```

```
Classification report:
Accuracy:  0.94
              precision    recall  f1-score   support

           0       0.94      0.97      0.96        66
           1       0.94      0.88      0.91        34

    accuracy                           0.94       100
   macro avg       0.94      0.93      0.93       100
weighted avg       0.94      0.94      0.94       100

Confusion matrix:
[[64  4]
 [ 2 30]]
```

In [ ]:

In [ ]:

In [ ]: