In [1]:

```
import pandas as pd
global_temp = pd.read_csv("GlobalTemperatures.csv")
print(global_temp.shape)
print(global_temp.columns)
print(global_temp.info())
print(global_temp.isnull().sum())
```

```
(3192, 9)
Index(['dt', 'LandAverageTemperature', 'LandAverageTemperatureUncertaint
y',
       'LandMaxTemperature', 'LandMaxTemperatureUncertainty',
       'LandMinTemperature', 'LandMinTemperatureUncertainty',
       'LandAndOceanAverageTemperature',
       'LandAndOceanAverageTemperatureUncertainty'],
      dtype='object')
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 3192 entries, 0 to 3191
Data columns (total 9 columns):
 #   Column                                     Non-Null Count  Dtype  
---  ------                                     --------------  -----  
 0   dt                                         3192 non-null   object 
 1   LandAverageTemperature                     3180 non-null   float64
 2   LandAverageTemperatureUncertainty          3180 non-null   float64
 3   LandMaxTemperature                         1992 non-null   float64
 4   LandMaxTemperatureUncertainty              1992 non-null   float64
 5   LandMinTemperature                         1992 non-null   float64
 6   LandMinTemperatureUncertainty              1992 non-null   float64
 7   LandAndOceanAverageTemperature             1992 non-null   float64
 8   LandAndOceanAverageTemperatureUncertainty  1992 non-null   float64
dtypes: float64(8), object(1)
memory usage: 224.6+ KB
None
dt                                              0
LandAverageTemperature                         12
LandAverageTemperatureUncertainty              12
LandMaxTemperature                           1200
LandMaxTemperatureUncertainty                1200
LandMinTemperature                           1200
LandMinTemperatureUncertainty                1200
LandAndOceanAverageTemperature               1200
LandAndOceanAverageTemperatureUncertainty    1200
dtype: int64
```

In [2]:

```
#Data Preparation
def wrangle(df):
    df = df.copy()
    df = df.drop(columns=["LandAverageTemperatureUncertainty", "LandMaxTemperatureUncert
                          "LandMinTemperatureUncertainty", "LandAndOceanAverageTemperatu
    def converttemp(x):
        x = (x * 1.8) + 32
        return float(x)
    df["LandAverageTemperature"] = df["LandAverageTemperature"].apply(converttemp)
    df["LandMaxTemperature"] = df["LandMaxTemperature"].apply(converttemp)
    df["LandMinTemperature"] = df["LandMinTemperature"].apply(converttemp)
    df["LandAndOceanAverageTemperature"] = df["LandAndOceanAverageTemperature"].apply(co
    df["dt"] = pd.to_datetime(df["dt"])
    df["Month"] = df["dt"].dt.month
    df["Year"] = df["dt"].dt.year
    df = df.drop("dt", axis=1)
    df = df.drop("Month", axis=1)
    df = df[df.Year >= 1850]
    df = df.set_index(["Year"])
    df = df.dropna()
    return df
```

In [3]:

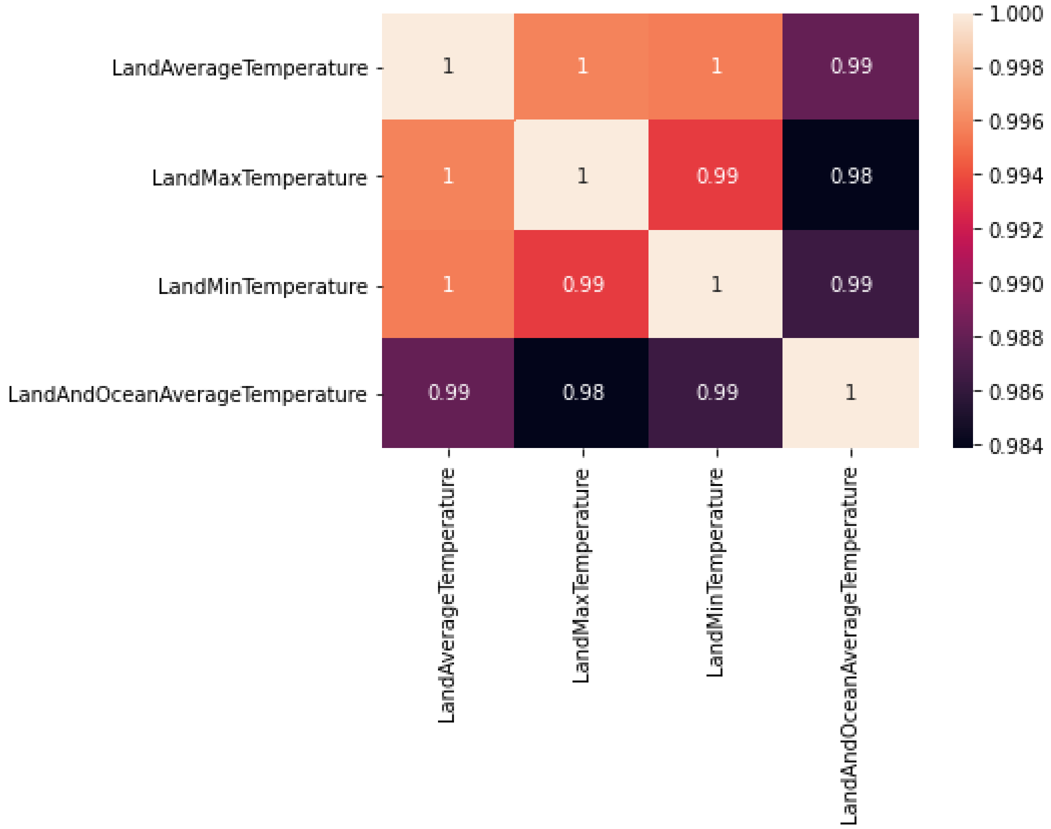
```
global_temp = wrangle(global_temp)
print(global_temp.head())
```

```
      LandAverageTemperature  LandMaxTemperature  LandMinTemperature  \
Year
1850                 33.3482             46.8356             26.2292
1850                 37.5278             49.9460             27.8762
1850                 40.9172             50.6246             28.5710
1850                 44.9906             55.2812             33.8324
1850                 50.0072             60.1790             38.8598

      LandAndOceanAverageTemperature
Year
1850                         55.0994
1850                         56.4584
1850                         57.2774
1850                         58.4006
1850                         59.9126
```

In [4]:

```
import seaborn as sns
import matplotlib.pyplot as plt
corrMatrix = global_temp.corr()
sns.heatmap(corrMatrix, annot=True)
plt.show()
```



In [5]:

```
target = "LandAndOceanAverageTemperature"
y = global_temp[target]
x = global_temp[["LandAverageTemperature", "LandMaxTemperature", "LandMinTemperature"]]
```

In [6]:

```
from sklearn.model_selection import train_test_split
xtrain, xval, ytrain, yval = train_test_split(x, y, test_size=0.25, random_state=42)
print(xtrain.shape)
print(xval.shape)
print(ytrain.shape)
print(yval.shape)
```

```
(1494, 3)
(498, 3)
(1494,)
(498,)
```

In [7]:

```
from sklearn.metrics import mean_squared_error
ypred = [ytrain.mean()] * len(ytrain)
print("Baseline MAE: ", round(mean_squared_error(ytrain, ypred), 5))
```

```
Baseline MAE:  5.29374
```

In [8]:

```
from sklearn.preprocessing import StandardScaler
from sklearn.pipeline import make_pipeline
from sklearn.feature_selection import SelectKBest
from sklearn.ensemble import RandomForestRegressor
forest = make_pipeline(SelectKBest(k="all"),StandardScaler(),
    RandomForestRegressor(
        n_estimators=100,
        max_depth=50,
        random_state=77,
        n_jobs=-1
    )
)
forest.fit(xtrain, ytrain)
```

Out[8]:

```
Pipeline(steps=[('selectkbest', SelectKBest(k='all')),
                ('standardscaler', StandardScaler()),
                ('randomforestregressor',
                 RandomForestRegressor(max_depth=50, n_jobs=-1,
                                       random_state=77))])
```

In [9]:

```
print("Training Accuracy :", forest.score(xtrain, ytrain))
print("Testing Accuracy :", forest.score(xval, yval))
```

```
Training Accuracy : 0.997300169812254
Testing Accuracy : 0.9802030421320908
```