**2. Problem Statement**

**Scipy:**

We have the min and max temperatures in a city In India for each months of the year.

We would like to find a function to describe this and show it graphically, the dataset

given below.

Task:

1. fitting it to the periodic function

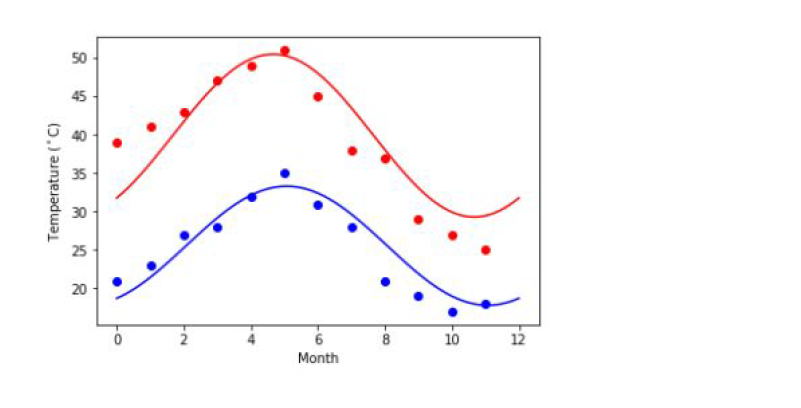
2. plot the fit

Data

Max = 39, 41, 43, 47, 49, 51, 45, 38, 37, 29, 27, 25

Min = 21, 23, 27, 28, 32, 35, 31, 28, 21, 19, 17, 18

**Expected Output:**

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**Code:**

#We have the min and max temperatures in a city In India for each months of the year.We would like to find a function to describe this and show it graphically. Data: Max = 39, 41, 43, 47, 49, 51, 45, 38, 37, 29, 27, 25, Min = 21, 23, 27, 28, 32, 35, 31, 28, 21, 19, 17, 18#

import numpy as np

temp\_max = np.array([39, 41, 43, 47, 49, 51, 45, 38, 37, 29, 27, 25])

temp\_min = np.array([21, 23, 27, 28, 32, 35, 31, 28, 21, 19, 17, 18])

import matplotlib.pyplot as plt

months = np.arange(12)

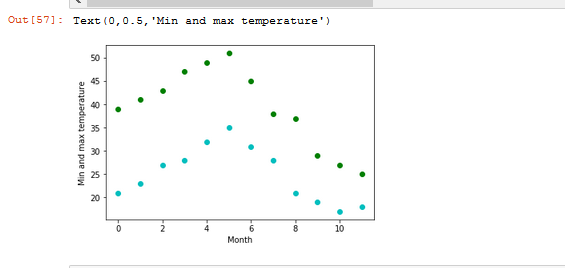
plt.plot(months, temp\_max, 'go')

plt.plot(months, temp\_min, 'co')

plt.xlabel('Month')

plt.ylabel('Min and max temperature')

**Output:**

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**1.Fitting it to the periodic function**

from scipy import optimize

def yearly\_temps(times, avg, ampl, time\_offset):

return (avg+ ampl \* np.cos((times + time\_offset) \* 1.8 \* np.pi / times.max()))

res\_max, cov\_max = optimize.curve\_fit(yearly\_temps, months, temp\_max, [40, 20, 0])

res\_min, cov\_min = optimize.curve\_fit(yearly\_temps, months,temp\_min, [-40, 20, 0])

**2.Plot the fit**

days = np.linspace(0, 12, num=365)

plt.figure()

plt.plot(months, temp\_max, 'go')

plt.plot(days, yearly\_temps(days, \*res\_max), 'm-')

plt.plot(months, temp\_min, 'co')

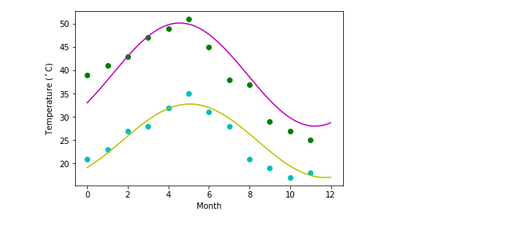
plt.plot(days, yearly\_temps(days, \*res\_min), 'y-')

plt.xlabel('Month')

plt.ylabel('Temperature ($^\circ$C)')

plt.show()

**Output:**

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**Matplotlib:**

This assignment is for visualization using matplotlib:

data to use:

url=

https://raw.githubusercontent.com/Geoyi/Cleaning-Titanic-Data/master/titanic\_original.cs

v

titanic = pd.read\_csv(url)

**Code:**

import numpy as np

import pandas as pd

import matplotlib.pyplot as plt

import seaborn as sns

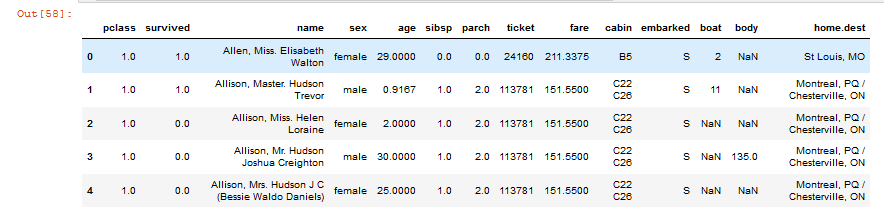
%matplotlib inline

filename = 'https://raw.githubusercontent.com/Geoyi/Cleaning-Titanic-Data/master/titanic\_original.csv'

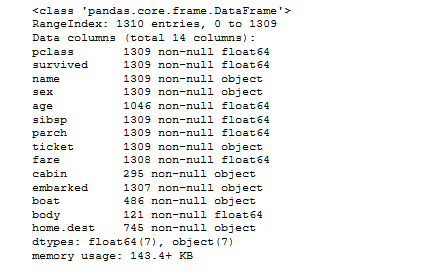
titanic\_df = pd.read\_csv('https://raw.githubusercontent.com/Geoyi/Cleaning-Titanic-Data/master/titanic\_original.csv')

titanic\_df.head()

Output:



titanic\_df.info()



Charts to plot:

1. Create a pie chart presenting the male/female proportion

**Code:**

def draw\_plot(titanic\_df):

proportions = []

sum\_instances = titanic\_df['sex'].value\_counts()

length = len(titanic\_df['sex'])

proportions = list(sum\_instances)

labels = ['Males','Females']

explode = (0,0.1)

sizes = proportions

fig, ax1 = plt.subplots(figsize = (6,6))

ax1.pie(sizes, explode = explode, labels = labels, shadow = True, startangle=90)

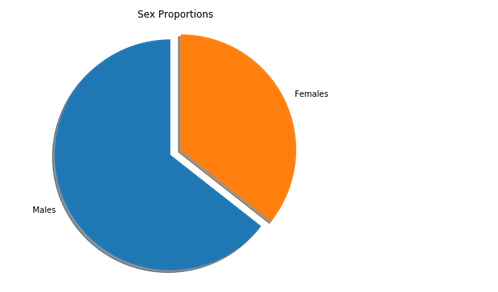
ax1.axis('equal')

ax1.set\_title("Sex Proportions")

return plt.show()

draw\_plot(titanic\_df)

**Output:**

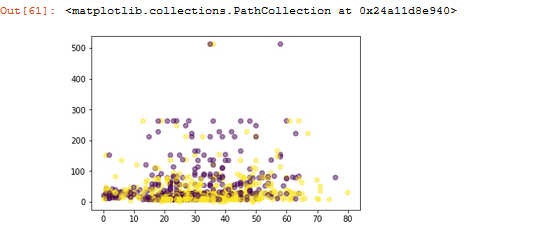


1. Create a scatterplot with the Fare paid and the Age, differ the plot color by gender

**Code:**

plt.scatter(titanic\_df['age'], titanic\_df['fare'], alpha=0.5, c=pd.factorize(titanic\_df['sex'])[0])

**Output:**

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