Session 10: Assignment 1

**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

Code:

%matplotlib inline

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')

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])

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')

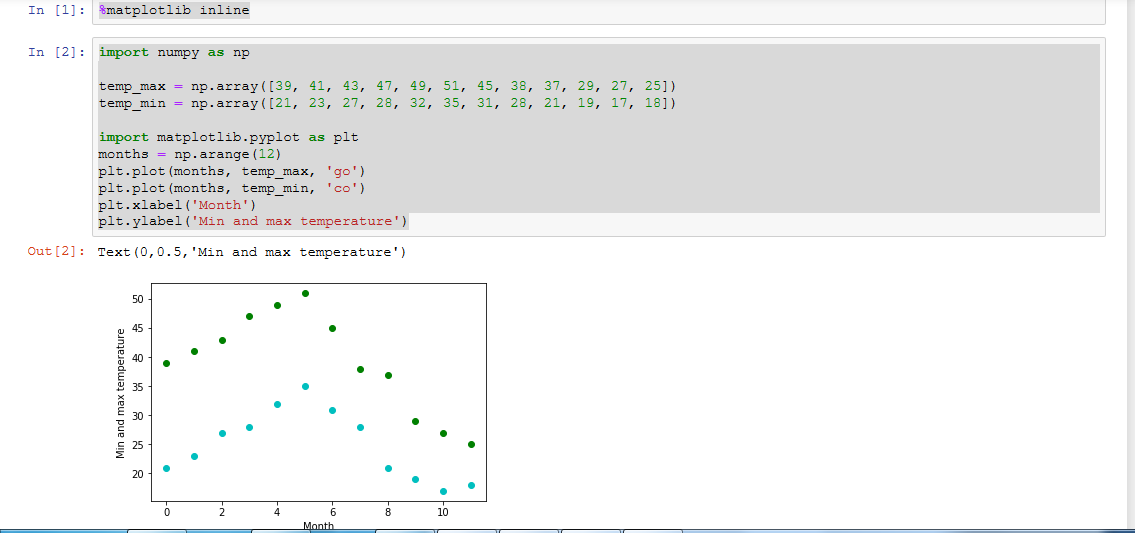
plt.plot(days, yearly\_temps(days, \*res\_min), 'y-')

plt.xlabel('Month')

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

plt.show()

Output:





Problem Statement

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)

Charts to plot:

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

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

Code:

import pandas as pd

import numpy as np

import os

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

titanic.head()

import matplotlib.pyplot as plt

# Gender data based on sex

gender\_data = titanic['sex'].value\_counts()

# Change the type float

gender\_data = gender\_data.astype(float)

import matplotlib.pyplot as plt

# Gender data based on sex

gender\_data = titanic['sex'].value\_counts()

# Change the type float

gender\_data = gender\_data.astype(float)

# set chart vars

fig = plt.figure(figsize=(8,4))

ax = fig.add\_axes((0,0,0.5,1))

ax.set\_title(' Gender Distribution on the Titanic ',

bbox={'facecolor':'white', 'pad':5})

labels = 'Male', 'Female'

colors = ['skyblue', 'pink']

explode = (0.1, 0)

plt.pie(gender\_data, explode=explode, labels=labels, colors=colors,

autopct='%1.1f%%', shadow=True, startangle=60)

plt.axis('equal')

plt.show()

import seaborn as sns

sns.set(style='darkgrid') # I like the ticks :)

sns.lmplot(x='fare', y='age', data=titanic,

fit\_reg=True, # Show regression line

hue='sex', # Color by gender

scatter\_kws={'alpha':0.5}) # use alpha to show concentration

Output:

