**SOURCE CODE:**

# Import Numpy, Pandas, scipy and matplotlib

import numpy as np

import pandas as pd

import matplotlib.pyplot as plt

from scipy import optimize

max\_t = np.array([39, 41, 43, 47, 49, 51, 45, 38, 37, 29, 27, 25]) # maximum temperature

min\_t = np.array([21, 23, 27, 28, 32, 35, 31, 28, 21, 19, 17, 18]) # Minimum temperature

months = np.array(range(1,13,1)) # 12 months in array

def yearly\_temp(times, avg, ampl, time\_offset): #function for formula, y=a+A∗cos((x+b)∗(2∗πϕ))

return (avg

+ ampl \* np.cos((times + time\_offset) \* 2 \* np.pi / times.max()))

res\_max, cov\_max = optimize.curve\_fit(yearly\_temp, months, max\_t, [20, 10, 0]) #curve fit for maximum temperature

res\_min, cov\_min = optimize.curve\_fit(yearly\_temp, months, min\_t, [20, 10, 0]) #curve fit for minimum temperature

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

plt.figure()

plt.plot(months, max\_t, 'ro') # plot maximum temperature as red dots

plt.plot(days, yearly\_temp(days, \*res\_max), 'r-') # plot maximum temperature as red lines

plt.plot(months, min\_t, 'bo') # plot minimum temperature as blue dots

plt.plot(days, yearly\_temp(days, \*res\_min), 'b-') # plot maximum temperature as blue lines

plt.xlabel('Month') # Label X axis

plt.ylabel('Temperature ($^\circ$C)') # Label Y axis

plt.show() # display graph

**OUTPUT:**

