Introduction to Programming

Session 3: Lists and Tuples

Name:

Batch:

Date:

Please answer all the questions with outputs (values or completed: yes/no) and return the sheet.

1. Create a list of noble gases: Helium, Neon, Argon, and Krypton.

a. **Add a new element "Radon" to the list.**
b. **Assign a new element Xenon to fifth position in the list.**
c. **Display the number of elements in the list.**
d. **Display the elements in the alphabetical order.**

2. Consider the bi-monthly (once every two months) temperature readings from a weather station in degrees: 25.2, 16.8, 31.4, 23.9, 28, and 22.5.

a. **Sort the temperatures in ascending order.**
b. **Create two lists: cool_temp and warm_temp, which contain the temperatures below and above 25 degrees Celsius respectively.**
c. **Find the average temperature reading of cool, warm and combined readings.**

3. Create a tuple of temperatures from Q2 and perform the following operations:

a. **Slicing**
b. **Check the existence of a particular temperature reading in the tuple.**
c. **Add a new reading to tuple.**
d. **Find the average temperature reading.**
e. **Create another tuple of temperature readings from another year and perform tuple concatenation.**

4. For the list of noble gases in Q1, assign atomic number to each element (Helium: 2, Neon: 10, Argon: 18, Krypton: 36, Xenon: 54, and Radon: 86) and sort the noble gases in decreasing order of atomic number.

4. Consider the following data of Top 6 Asian economies (2023 Nominal GDP as per IMF in Millions of US Dollars):

COUNTRY	GDP (2023)	GDP Growth Rate (%)	Population (2023)	Population Growth Rate (%)
China	19,373,586	4.5	1,411,750,000	0.01
Japan	4,409,738	1.3	125,416,877	-0.3
India	3,736,882	5.9	1,388,163,000	0.8
South Korea	1,721,909	1.5	51,408,155	-0.1
Indonesia	1,391,778	5.0	277,749,853	0.7
Saudi Arabia	1,061,902	5.0	34,110,821	1.5

[Data Taken from Wikipedia and IMF Data Tables]

As a Data Analyst for the Organization,

a. **Calculate the Per-Capita GDP (Nominal) for these six countries in 2023.**
b. **Assuming stable rates, calculate Population, GDP and Per-Capita GDP for all countries in 2030.**
c. **Predict the year when Saudi Arabia will overtake South Korea in population.**
d. **Evaluate the average GDP growth rate that India needs to match China's GDP in 2040.**
e. **Evaluate the average GDP growth rate that India needs to match Per-Capita GDP of Japan in 2040.**