**Python Programming for Data Engineering Assignment-2**

**Below is the description of the CALCOFI dataset. Answer the questions at the end of this document. As bonus, create a GUI setup for answering these questions:**

**—- —------------------ —----------- —------------ —---------------------**

### Station/Metadata

* Cst\_Cnt: Cruise station count
* Btl\_Cnt: Bottle count
* Sta\_ID: Station identifier
* Depth\_ID: Depth sample ID
* Depthm: Sample depth in meters

### Temperature and Salinity

* T\_degC: Temperature in degrees Celsius
* Salnty: Salinity (practical salinity units, PSU)
* T\_prec, S\_prec: Temperature/Salinity precision indicators
* T\_qual, S\_qual: Quality flags for temperature/salinity

### Oxygen

* O2ml\_L: Oxygen concentration (ml/L)
* Oxy\_µmol/Kg: Oxygen in micromoles per kilogram
* O2Sat: Percent oxygen saturation
* O\_qual: Quality of oxygen data
* O2Satq: Quality flag for O2 saturation

### Density

* STheta: Sigma-Theta (density anomaly)
* SThtaq: Quality flag for Sigma-Theta

### Nutrients

* PO4uM: Phosphate in micromoles per liter
* PO4q: Quality of phosphate data
* SiO3uM: Silicate in µmol/L
* SiO3qu: Quality flag for silicate
* NO2uM: Nitrite (µmol/L)
* NO2q: Nitrite quality
* NO3uM: Nitrate (µmol/L)
* NO3q: Nitrate quality
* NH3uM: Ammonia (µmol/L)
* NH3q: Ammonia quality

### Chlorophyll and Phaeopigments

* ChlorA: Chlorophyll-a (µg/L)
* Chlqua: Chlorophyll-a quality
* Phaeop: Phaeopigments (degraded chlorophyll)
* Phaqua: Phaeopigment quality

### Carbon-14 Primary Productivity

* C14As1, C14A1p, C14A1q: 1st light bottle C14 assimilation, productivity, quality
* C14As2, C14A2p, C14A2q: 2nd light bottle
* DarkAs, DarkAp, DarkAq: Dark bottle assimilation (control)
* MeanAs, MeanAp, MeanAq: Mean productivity measures
* IncTim: Incubation time
* LightP: Light penetration (likely % or PAR)

### Replicate & Reference Samples

* R\_Depth, R\_TEMP, R\_POTEMP, R\_SALINITY, etc.: Replicate/reference values for validation

### Carbonate Chemistry

* DIC1, DIC2: Dissolved Inorganic Carbon measurements
* TA1, TA2: Total Alkalinity
* pH1, pH2: pH measurements
* DIC Quality Comment: Notes on carbon chemistry data quality

—-------------------------------------------------------------------  
Q1. Use a scatter or bar-graph plot or any other plot style, find the station-ID for which the **Salinity** and  **Temperature in degrees Celsius** are both the highest. [10 marks]

Q2. By any plotting method, Find the **Cruise station count number** that has maximum variation in the **Salinity** parameter**.**  [10 marks]

Q3. By any plotting method, Find the **Cruise station count number** that has the average **Temperature in degrees Celsius** parameter as maximum. [10 marks]

—---------------------------------------- x—----------------------------------------------