Documentation OF SQL QUERIES (TASK-2)

1. Extract Data for Specific Vessel and Voyage

Objective:

Filter records for a specific vessel and voyage while excluding those with a non-null `allocatedVoyageId`.

Logic:

- Use `imo_num` and `voyage_Id` conditions to select data for vessel '9434761' and voyage '6'.
- Exclude records where `allocatedVoyageId` is not null to isolate primary voyage segments.

2. Calculate Precise UTC Date-Times and Durations

Objective:

Convert `dateStamp` and `timeStamp` into UTC datetime format and calculate time durations between consecutive events.

Logic:

- Convert `dateStamp` and `timeStamp` into UTC datetime using appropriate transformations.
- Calculate `duration_seconds` as the difference in seconds between each event (`e1`) and the subsequent event (`e2`).

3. Segment Voyage Stages based on 'SOSP' and 'EOSP' Events

Objective:

Identify and segment different voyage stages based on pairs of 'SOSP' (Start of Sea Passage) and 'EOSP' (End of Sea Passage) events.

Logic:

- Self-join the `voyages` table to pair consecutive events (`e1` and `e2`) where:

  `e1.event = 'SOSP'` and `e2.event = 'EOSP'` or

  `e1.event = 'EOSP'` and `e2.event = 'SOSP'`.

- Ensure chronological order (`e1` before `e2`) using appropriate conditions in the join.

4. Calculate Cumulative Sailing Time and Time Spent at Ports

Objective:

Calculate cumulative sailing time and time spent at ports for each voyage segment.

Logic:

- Aggregate `duration_seconds` based on event pairs (`'SOSP'-'EOSP'` for sailing time and `'EOSP'-'SOSP'` for port stay time) using conditional sums (`SUM(CASE WHEN ... THEN duration_seconds ELSE 0 END)`).
- Group results by `voyage_Id` to compute these metrics for each unique voyage.

5. Introduce Geographic Movement with Distance Calculation

Objective:

Calculate the approximate distance between consecutive ports based on hypothetical latitude andlongitude data.

Logic:

- Use the Haversine formula to calculate the distance (`distance_km`) between consecutive ports.
- Calculate distance only when the pair of events represents movement from `'EOSP'` (End of Sea Passage) to `'SOSP'` (Start of Sea Passage), indicating movement between ports.