**Script Documentation: ICU Stay Times**

* **Overview**This SQL script generates a detailed table containing the start and end times of heart rate measurements for each patient's ICU stay. The timestamps are derived from the admission and discharge times, ensuring a comprehensive record of patient monitoring during their ICU stay.
* **Key References**MIMIC-III Clinical Database, version 1.3.
* **Logic Summary**The script performs the following key tasks:
  + **Hospitalization Time Adjustment**: It computes the start and end times for each hospitalization, adjusting for instances of multiple admissions within a 24-hour period.
  + **Heart Rate Measurement Capture**: It retrieves the first and last heart rate measurements recorded for each ICU stay.
* **Process Steps**
  + **CTE for Hospitalizations (h)**:
    - Selects subject\_id, hadm\_id, admission, and discharge times from the admissions table.
    - Utilizes the LAG and LEAD functions to obtain the previous and next discharge/admission times for each patient, respectively.
  + **CTE for Adjusted Admission Times (adm)**:
    - Calculates adjusted start (data\_start) and end (data\_end) times for each hospitalization.
    - If two hospitalizations occur within 24 hours, the times are set to halfway between the two admissions; otherwise, default to 12 hours before the admission and after the discharge.
  + **CTE for Heart Rate Measurements (t1)**:
    - Selects the minimum and maximum heart rate measurement times (intime\_hr, outtime\_hr) for each icustay\_id from the chartevents table.
    - Joins with the adm CTE to filter heart rate measurements based on the computed admission time intervals, only including relevant item IDs (heart rate).
  + **Final Selection**:
    - Combines data from the icustays table with the heart rate measurements to produce a comprehensive dataset of each patient's ICU stay, including subject\_id, hadm\_id, icustay\_id, intime\_hr, and outtime\_hr.
    - Orders the results by subject\_id, hadm\_id, and icustay\_id.
* **Output**The script generates a new table, icustay\_times, with the following columns:
  + **subject\_id**: Unique identifier for the patient.
  + **hadm\_id**: Unique identifier for the hospital admission.
  + **icustay\_id**: Unique identifier for the ICU stay.
  + **intime\_hr**: Timestamp of the first heart rate measurement during the ICU stay.
  + **outtime\_hr**: Timestamp of the last heart rate measurement during the ICU stay.

**Example Query**To retrieve ICU stay times for a specific patient:  
sql  
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SELECT \*

FROM icustay\_times

WHERE subject\_id = 12345;

* **Important Notes**
  + The script captures heart rate data only within the adjusted admission timeframes to ensure relevant measurements are included.
  + The use of item IDs in the chartevents table is limited to those that represent heart rate measurements.
* **Conclusion**This script creates a comprehensive dataset that encapsulates the start and end of heart rate measurements for each ICU stay, enhancing the understanding of patient monitoring and outcomes during critical care.