**Script Documentation: ICU Stay Hourly Records**

* **Overview**This SQL script generates a detailed record for every hour a patient is in the ICU. The hourly records are based on clock hours (e.g., 02:00, 03:00), starting from 24 hours before the first heart rate measurement, with the measurement time ceilinged to the hour. The resulting dataset can be used for further analysis of patient data related to their ICU stay.
* **Key References**MIMIC-III Clinical Database, version 1.3.
* **Logic Summary**The script constructs a dataset that includes:
  + **ICU Stay Identification**: Each row corresponds to an icustay\_id indicating which patient's ICU stay the hour data pertains to.
  + **Hourly Indexing**: Each ICU stay is indexed by every hour the patient was present in the ICU, from 24 hours prior to their admission until their discharge.
  + **End Time Calculation**: The end time for each hour is calculated based on the ICU stay's admission time plus the hour offset.
* **Process Steps**
  + **CTE for All Hours (all\_hours)**:
    - Selects icustay\_id from the icustay\_times table.
    - Computes the endtime by ceiling the intime to the nearest hour.
    - Generates a series of integers representing each hour the patient spent in the ICU, allowing for up to 24 hours before ICU admission to capture relevant pre-admission data.
  + **Final Selection**:
    - Selects each icustay\_id and the corresponding hour (hr).
    - Calculates the exact endtime for each hour by adding the hour offset to the endtime.
    - Orders the output by icustay\_id.
* **Output**The script generates a new table, icustay\_hours, containing the following columns:
  + **icustay\_id**: Unique identifier for each ICU stay.
  + **hr**: Integer representing each hour indexed from the admission time.
  + **endtime**: Timestamp indicating the end time of each hour during the patient's ICU stay.

**Example Query**To retrieve hourly records for a specific ICU stay:  
sql  
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SELECT \*

FROM icustay\_hours

WHERE icustay\_id = 12345;

* **Important Notes**
  + The time of the first heart rate measurement is adjusted to the nearest hour by adding 59 minutes before truncating.
  + The script allows for capturing data up to 24 hours prior to the ICU admission to include any relevant lab data.
* **Conclusion**This script creates a comprehensive hourly record of patient ICU stays, facilitating time-based analyses of patient data and enhancing the understanding of patient monitoring in critical care.