**TEAM13-GROUPING LEGENDS-SQL HACKATHON**

**Category 1 Questions: SIMPLE QUERIES**

1. **List the total count of patients from the demography table.**

QUERY:



OUTPUT:

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AI-generated content may be incorrect.

Insights:

This above result gives the total number of patients in this dataset.

1. **List the total count of male/female from the demography table.**

QUERY:

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OUTPUT:

A screenshot of a computer

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Insights:

The above result gives the number of male and female patients in this dataset.

1. **What percentage of dataset is maleVsfemale?**

QUERY:

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OUTPUT:

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Insights:

This result gives the percentage of male and female patients in the dataset.

1. **Which patient has the maximum hba1c?**

QUERY:

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OUTPUT:

A screenshot of a computer

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Insights:

The above result gives the patient who has maximum hba1c value measured.

1. **Find the overall Average glucose level of patients with their gender?**

QUERY:

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Insights:

The above result gives the overall average glucose levels of patients.

1. **Categorize patients based on their glucose category**

QUERY:

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OUTPUT:

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**Insights:** By categorizing patients based on glucose values,we understand risk distribution and could guide 'PreDiabetics' to prevent progression to Diabetes.

1. **Display the count of patients by glucose category (‘normal’, ‘prediabetic’ or ‘diabetic’)**

QUERY:

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OUTPUT:

A screenshot of a computer

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**Insights:** In the given dataset, the majority fall under Pre-Diabetics. Counts help in resource allocation

1. **Show total calorie intake of patients in a day**

QUERY:

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OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

**Insights :** Understand which patients consume more or fewer calories and identify trends or outliers like unusually high or low intake days.

1. **Follow-up to the above Query: Compare calorie intake of patient per day with gender**

QUERY:

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OUTPUT:

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**Insights:** This query provides gender-based dietary analysis showing calorie intake

of each patient and helps in extending the analysis about glucose control, weight or other health metrics.

1. **Average glucose within 3 hours after food logged?**

QUERY:

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OUTPUT:

A screenshot of a computer

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**Insights:** This query tells the average glucose reading of each patient 3 hrs

after food intake. In Prescriptive analysis, this is useful in dietary recommendations for Diabetes management.

1. List all the foods with their calories from highest to lowest?

QUERY:

A close-up of a computer screen

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OUTPUT:

A screenshot of a menu

AI-generated content may be incorrect.

Insights:

The above result gives the count of calories of foods in descending order from highest to the least. This helps to determine which foods tend cause spike in glucose levels in patients.

1. **List the food with the maximum calorific value and sugar value?**

QUERY:

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A close-up of text

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OUTPUT:

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Insights:

The above result gives the food which has maximum calorie content and sugar content. This also helps in determining whether they are responsible for glucose spike in patients.

1. **List the food which has maximum protein content?**

QUERY:

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OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above result gives the food which is high on protein compared to all other foods. High protein diet does not cause glucose to spike in the body and is good for controlling diabetes.

1. **List all the foods with their fiber content highest to lowest?**

QUERY:

A close-up of a computer code

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OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above result lists all the foods with their dietary fiber content from highest to lowest. High fiber diet is also very good in controlling diabetes and rise in glucose levels.

1. **List the foods which are high on fat?**

QUERY:

A computer code with text

AI-generated content may be incorrect.

OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above query lists the food which is high on fat content. They do play a role in the glucose levels of patients.

1. **Categorize patients based on their temperature levels?**

QUERY:

A close-up of a text

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OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above query categorizes the patients with their temperature category. High Temperature is categorized as fever and low temperature is categorized as Hypothermia

1. **Calculate the average heart rate per day for each patient**

QUERY:

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OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above results gives the day wise average heartrate for each patient. This shows whether the heart rate remains stable or fluctuates each day.

1. **To calculate day wise ibi (Interbeat Interval) values for all the patients**

QUERY:

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OUTPUT:

A screenshot of a computer

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Insights:

The above result gives the interbeat interval (IBI values). An interbeat interval (IBI) is the time duration between two successive heartbeats. Also known as the heart period or RR Interval. it is a fundamental measure of heart rate and is a primary input for heart rate variability (HRV) analysis. The higher the IBI,lower the heart rate. Higher IBI is actually good for the heart and the heart rate tends to remain low which is a very healthy sign for a patient.

1. **How are IBI and HR inversely linked to each other?**

QUERY:

**A computer code with text

AI-generated content may be incorrect.**

OUTPUT:

**A screenshot of a computer

AI-generated content may be incorrect.**

Insights:

The above results give a strong inverse relationship between IBI and HR. Whenever the IBI increases, heart rate decreases, which is good for the heart.

1. **Calculate the average EDA per day for each patient?**

QUERY:

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Insights:

Electrodermal activity (EDA), also known as galvanic skin response (GSR), is a physiological measure that reflects changes in the electrical conductivity of the skin. Low EDA is actually for the body and it means the body is effectively managing stress where as high EDA means the person tends to have more stress. Lower the EDA, the better it is. Here we can see that patientid 1 has a very high EDA score ot 6.89. This means that on that particular day, the person must have been under severe stress.

1. **Calculate the average temperature measured per day for each patient**

QUERY:

A computer code with text

AI-generated content may be incorrect.

OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above query gives the average body temperature measured each day. Usually the normal body temperature is 37.5 degrees Celsius. Any temperature less than this is hypothermia and any temperature higher than this causes fever.

1. **Categorize the meal type based on their carbohydrate levels**

QUERY:

A screenshot of a computer

AI-generated content may be incorrect.

OUTPUT:

A screenshot of a menu

AI-generated content may be incorrect.

Insights:

The above query lists the meals based on their carbohydrate content. High carb meals are a major cause for glucose spike in patients

1. **List the top 5 high carbohydrate foods.**

QUERY:

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OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above output gives the top 5 foods that have the maximum carbohydrate content.

1. **Display the maximum glucose level of each patient and the food they ate on that day and the food’s calorie content and sugar content.**

QUERY:

A screenshot of a computer program

AI-generated content may be incorrect.

OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above query displays the maximum glucose level of a patient and on which day he had the maximum level and what food he ate. The calorie content and sugar content is also displayed. This helps to determine whether a person has high glucose level due to high calories or high sugar

Category 2-INTERMEDIATE LEVEL QUERIES

1. **Get the patients, number of days their ibi values were measured, along with their average ibi values**

QUERY:

A computer screen with text

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OUTPUT:

A screenshot of a computer

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Insights:

The above result gives us the number of days each patient’s IBI value was measured and their maximum IBI and the minimum IBI value. The higher the IBI, lower is the heart rate. This is actually very good for the body as the body is in a very calm and composed state and this prevents the onset of diabetes and even heart-related diseases.

1. **Rank the average ibi values using rank()**

QUERY:

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OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

This result ranks the average ibi values from least to the highest. Patient id 15 has the least IBI which is very worrying as he has a very high average heart rate value 90. Lower the IBI, higher the heart rate will be. Patient id15 has a very high chance of developing heart related diseases.

1. **Calculate the moving average of ibi values?**

QUERY:

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Insights:

 By averaging a set of consecutive IBI values, the moving average highlights slower, more gradual changes in heart rhythm. These longer-term trends can be more indicative of the body's physiological state, such as its response to stress, exercise, or rest

1. **Calculate the average, maximum,minimum eda values?**

QUERY:

A computer code with text

AI-generated content may be incorrect.

OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above output gives the average EDA, maximum EDA, and minimum EDA of each patient. Higher the EDA, it means that the person is under severe stress and he needs to work on reducing his stress levels to maintain a healthy body.

1. **How much does the EDA fluctuate?**

QUERY:

A close-up of a computer screen

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OUTPUT:

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Insights:

The above result gives EDA variability for each patient. If the EDA variability >3, it indicates strong swings in autonomic activity. The patient may have large shifts between stress and relaxation, which sometimes seen in people with high emotional reactivity, anxiety, or stress dysregulation. If the EDA <3, indicates blunted or reduced sympathetic responsiveness. This could occur in fatigue, depression, or autonomic hypoactivity (reduced physiological flexibility). It can also indicate stable calmness if the person is consistently relaxed. For example, here patient id 1 and 7 has a very high EDA variability which means they might be stressed or in some kind of trauma.

1. **How much does the HR (Heart Rate)(HRV-Heart Rate Variability)fluctuate?**

QUERY:

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OUTPUT:

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Insights:

High HR (heart rates) are generally associated with low HR variability. So if a person has high HR Variability (17-18), it means that that person has good cardiovascular fitness, resilience to stress and better recovery. Moderate HRV (15-17) indicates normal and healthy body where the Body adapts to stress. Low HRV (<15) indicates chronic stress, fatigue, inflammation, poor sleep, depression or cardiac risk.

**7. Rank the patients with high stress levels**

QUERY:

A computer code with many colorful text

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OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

High EDA variability (>4) indicates that a patient could reflect anxiety, emotional instability, pain responses, or periods of high stress or agitation (common in sepsis, delirium, or ICU patients). Moderate EDA variability indicates that a person is healthy and is recovering from any health problems. Low EDA variability occurs in cases of fatigue, sedation, severe illness or reduced stress response.

8. **Calculate the daily EDA variability of patients.**

QUERY:

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Insights:

The above results show the daily EDA variability of patients. This helps to determine the everyday stress levels of patients and helps them to mitigate stress related illnesses. Moderate EDA variability indicates a healthy body.

**9. Calculate the cumulative eda values for each patient day wise**

QUERY:

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OUTPUT:

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Insights:

cumulative\_avg\_eda (overall trend)

This smooths the daily fluctuations and helps to see if the patient is:

**Improving (Moderate to low EDA)** → decreasing sympathetic activity → stabilizing or recovering.

**Worsening (High EDA)** → increasing sympathetic activation → possible ongoing stress, pain, infection, or worsening clinical condition.

For example if we take patient id 1, on 13th the EDA value is low. But next day, there is a sudden spike in EDA value which indicates that the patient underwent acute stress or strong sympathetic response (eg. Infection or pain). Then next day again it drops drastically which indicates recovery from previous stress episodes.

**10. Display EDA variability with their gender**

QUERY:

A computer code with text

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OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above result shows the average EDA values with their gender. Here we can see that Female patients have high EDA values compared to male patients. This indicates that female patients have undergone lot of stress episodes compared to male patients.

**11. Determine the Correlation between EDA and HR?**

QUERY:

A computer code with text

AI-generated content may be incorrect.

OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above results show the correlation between EDA and Heart Rate values of patients. The result indicates that there is very minimal to no positive correlation between EDA and HR as the correlation value is 0.23 which is more or less close to zero.

**12. Determine the Correlation between IBI and HR?**

QUERY:

A computer code with text

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OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above result indicates that there is a strong negative correlation between IBI and HR. As previously discussed, when the IBI increases, the HR decreases and also vice versa.

13. **Determine the Correlation between glucose and EDA?**

QUERY:

A computer screen shot of a computer code

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OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

Here we observe that there is absolutely no correlation between EDA and glucose levels.

**14. Add Row number based on the glucose levels**

QUERY:

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OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

Here we use row\_num() to add rows based on glucose levels lowest to highest for each patient for every reading so that we can easily identify on which days the glucose levels was low and gradually how it is increasing during the day.

**15. Use NTILE() to determine the ranking of patients based on their glucose levels**

QUERY:

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OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

Here, the glucose values of each patient is categorized into three categories using Ntile(). It has categorized the glucose readings from 120-131 as 1, from 109-115 as 2, from 93-109 as 3.

**16. Calculate overall avg ibi values across all days for all the patients?**

QUERY:

A computer code with text

AI-generated content may be incorrect.

OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above result displays the overall average IBI values of all patients.

**17. Determine the ranking for the heart rate variability using rank()**

QUERY:

A computer code with text

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OUTPUT:

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

Patients with high HRV indicate healthy vagal tone, good adaptability and strong recovery. They usually recover fast from illnesses. But patients with low HRV have reduced vagal activity and also high stress. They might have critical illnesses or heart-related ailments. High HRV indicates low Heart Rate and low HRV indicates high heart rate. So here we use rank () to rank the patients based on their HRV from high to low. The highest rank is assigned for patients with high HRV and gradually the rank decreases with decreasing HRV values.

**18. Calculate overall Average heart Rate for all the patients?**

QUERY:

A computer code with text

AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above result gives the overall average heart rate for all the patients over all the days.

**19. Calculate the overall average temperature of patients**

QUERY:

A screen shot of a computer code

AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above results give the overall average temperature of patients across all days.

**20. Calculate the overall average EDA values of all patients?**

QUERY:

A computer code with text

AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above results display the overall average EDA values across all days

**21. To find the average ibi per patient,avg ibi overall and their difference**

QUERY:

A computer screen shot of text

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OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above results show the individual patient’s average IBI values, the overall average and the difference. If the individual average IBI is more than the overall average, then it is actually a very good sign of good heart health. As mentioned earlier, greater the IBI, lower the heart rate will be, which is actually very good.

**22. Find the Total weekly calorie intake of patients**

QUERY:

A computer screen shot of text

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OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

These results give the weekly calorie intake of each patient and on which week of the year.

**23. Find the Heart Rate change using lead()**

QUERY:

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OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

These results show the change in the heart rate each day. It helps to determine how much the heart rate fluctuates every minute and if there is a drastic change, then it might be a worrying sign and attention is required.

**24. Find the lowest heart rate and highest heart rate for each patient using**

**first\_value() and last\_value()**

QUERY:

A screenshot of a computer code

AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

These results capture the lowest heart rate measured and the highest heart rate measured on the first day and the last date.

**25. Calculating the median value of glucose values for each patient using**

**percentile\_cont() and percentile\_disc()?**

QUERY:

A screenshot of a computer code

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OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

These results capture the median glucose values using percentile\_cont() and percentile\_disc() functions.

**26. To find the cumulative calories based on food taken by patients partioned over timeof**

QUERY:

A white background with colorful text

AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

These results display the cumulative calories taken by the patient on the same time of a day.

27. **Show Coefficient of variation for glucose values for each patient**

QUERY:

A computer screen shot of a computer code

AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

Identify patients who need closer monitoring.

For example, patients with CV>25% when avg glucose = 250 mgdl are considered to be having

uncontrolled hyperglycemia compared to patients with CV>25% when avg glucose = 110 mgdl.

By combining this result with demographic or medication data (e.g., age, insulin use, diet), clinicians can explore why some patients have higher variability — such as diet inconsistencies, poor adherence, or comorbidities.

**28. Which patient has the maximum glucose level compared to all other patients and on which day?**

QUERY:

A screenshot of a computer code

AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

These results show which patient has the maximum glucose levels measured compared to all other patients and on which day, the maximum level was measured.

**29. Calculate the maximum EDA measured for each patient and on which day based on their EDA ranking**

QUERY:

A screenshot of a computer code

AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above results show the maximum EDA measured and on which day. This shows that the person on that day was having high stress levels compared to other days.

30. **Calculate the average Heart Rate (HR) for all patients, grouped by the hour of the day (0-23)**

QUERY:

A screenshot of a computer program

AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

Identifies the circadian rhythm of the group's heart rate. High HR during late afternoon might indicate post-work stress or evening exercise. The lowest HR should typically be observed during deep sleep hours (early morning).

31. **Identify the average IBI for male patients versus female patients specifically during the assumed sleep window (10 PM to 6 AM).**

QUERY:

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AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

Sleep is a crucial recovery period. This comparison checks for gender differences in autonomic nervous system recovery (measured via IBI/HRV) during key rest hours.

32. **For each patient and day, find the difference between the maximum and minimum recorded temperature (daily temperature fluctuation).**

QUERY:

A computer code with text

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OUTPUT

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Insights:

Daily temperature variability can be an indicator of metabolic state, illness, or fever. A large fluctuation might signal infection or, in the context of sleep studies, poor thermal regulation.

Category3-ADVANCED QUERIES

1. **Write a procedure to get all the patients who have glucose levels>110**

QUERY:

A screen shot of a computer code

AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

This procedure lists all the patients who have glucose levels>110.

1. **Write a Function to categorize patients into three categories based on heartrate?**

QUERY:

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OUTPUT

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A screenshot of a computer

AI-generated content may be incorrect.

Insights:

This function categorizes all the patients based on their heart rate category. Normal heart rate would be 72 beats/min. Any HR value less than 70 is low and HR >80 is high Heart Rate.

1. **Create a stored procedure to get all the critical parameters of patient with patientid as input**

QUERY:

A screenshot of a computer program

AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

This procedure gives all the vital parameters of a patient at one go just by taking patientid as the input

1. **Write a stored procedure to get all the patients who have hba1c>6**

QUERY:

A computer screen shot of text

AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

This procedure lists the patients who have hba1c values >6. Hba1c is a critical parameter for glucose analysis. High hba1c (>6) is a major sign of diabetes.

1. Write a stored procedure to check if a patientid exists in the demography table.

QUERY:

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OUTPUT

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1. **Write a function to get the abnormal vital parameters**

QUERY:

**A screenshot of a computer program

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OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

This function retrieves all the patients who have abnormal health parameters (mainly high glucose and high HR)

1. **Create a trigger function to log entry of new patient into new\_patient\_entry table whenever a patient is inserted into the gv\_demography table**

QUERY:

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A computer screen shot of text

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**The table new\_patient\_entry is empty with no records now.**

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**Now inserting a new record in the gv\_demography table.**

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AI-generated content may be incorrect.

**Now when we select from the new\_patient\_entry table, we can see the new inserted record**

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1. **Write a trigger to log the old and new entry of hba1c patient into the hba1c change table**

QUERY:

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AI-generated content may be incorrect.

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**Now we can see that the hba1c\_change\_table is empty with no records**

A screenshot of a computer

AI-generated content may be incorrect.

**Now we update a record in the gv\_demography table with the new hba1c value**

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AI-generated content may be incorrect.

Now when we check the table hba1c\_change\_table:

**Select \* from hba1c\_change\_table**

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1. **Get the glucose value measured on first day and last day and taking their difference**

QUERY:

A screenshot of a computer code

AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

These results give the glucose measurement on the first day and the last day and gives the difference. This easily tells us how the patient has maintained their glucose levels over the days. If it has decreased, it is a good sign.

1. **Find the patient who has minimum IBI across all the days and among all the patients**

QUERY:

A screenshot of a computer code

AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

This patient has the minimum IBI value compared to all other patients. This means that she has a very high Heart rate which is an important sign for proper hear functioning.

1. **Find the seven day moving average of glucose levels of all the patients**

QUERY:

A screenshot of a computer code

AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect. Insights:

These results gives the 7-day moving average of glucose levels. This helps in easier glucose monitoring in diabetic patients.

1. **Find the difference in calories intake by patients between current week and previous week**

QUERY:

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A computer screen shot of a program

AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect. Insights:

These results show the difference in calorie intake between current week and the previous week. This explains about the patients dietary habits across 2 weeks of data

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1. **Display the maximum calories intake by all the patients and on which day based on the calorie ranking**

QUERY:

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OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

The above results display the maximum calories consumed by the patient on which day and what food he had on that day. This helps the patient to streamline their dietary choices for beter glucose control.

1. **On which day, maximum glucose levels were measured based on the glucose ranking.**

QUERY:

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OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

These results explain on which day a patient had maximum glucose level compared to all other days. We can relate this with the previous query result. For example, let’s consider patientid 1. He had maximum calorie food on 18thand now in the above result, the same patient id 1 has measured maximum glucose level on the next day. This shows that high calorie food is definitely one of the main reasons for glucose levels spike.

1. **Calculate the RMSSD (Root mean square of successive differences) values using ibi values of patients**

QUERY:

A screenshot of a computer code

AI-generated content may be incorrect.

OUTPUT

A screenshot of a computer

AI-generated content may be incorrect.

Insights:

RMSSD (Root Mean Square of Successive Differences) is a crirtical parameter and highly regarded time-domain measure of Heart Rate Variability (HRV). It specifically reflects the short-term, beat-to-beat variability in heart rate and is considered a strong indicator of parasympathetic nervous system (PNS) or vagal tone activity.

Here's what we can infer from RMSSD values: Higher RMSSD values indicate higher vagal tone and more robust parasympathetic nervous system activity. This suggests that the body is in a more relaxed state, capable of efficient "rest and digest" functions and recovery.

Lower RMSSD values suggest reduced vagal tone and diminished parasympathetic influence. This often points towards a state of stress, fatigue, or less efficient recovery mechanisms.

Typical ranges for healthy adults at rest can vary significantly, often extending from below 20 to over 70 milliseconds (ms), with young athletes potentially exhibiting values exceeding 200ms.

Here we can see that most of the patients have RMSSD values between 40-105 milliseconds.