

## Question 1:

### PAC Chart:

DATA GIVEN	REQUIRED RESULT(S)
<ul style="list-style-type: none"><li>• Transaction Amount</li><li>• Transaction Locations</li><li>• Transaction Time</li><li>• Daily withdrawal limits</li></ul>	<ul style="list-style-type: none"><li>• Identify and flag suspicious transaction activity</li></ul>
REQUIRED PROCESSING	SOLUTION ALTERNATIVE(S)
<ul style="list-style-type: none"><li>• Store the user's transaction amount of the day and keep track of it by incrementing the variable as necessary. Also keep track of the location and time of the previous and ongoing transactions.</li><li>• If the transaction amount exceeds transaction limit, flag the transaction.</li><li>• If the location of the transaction varies drastically from the usual locations, then flag.</li><li>• If the timing of the transaction doesn't match the user's general behavior, flag the transaction. If there are more than 3 transactions within the hour, flag.</li><li>• If the daily withdrawal limit is exceeded and user still attempts transactions, flag as suspicious</li></ul>	<ul style="list-style-type: none"><li>• Block the account temporarily if there are too many flags</li><li>• Categorize flags based on level of suspicion and danger.</li></ul>

**IPO Chart:**

INPUT	PROCESS	MODULE REF	OUTPUT
<ul style="list-style-type: none"> <li>• Total Transactions of the day</li> <li>• Previous Transaction History</li> <li>• Current transaction amount</li> <li>• Transaction Location</li> </ul>	<ul style="list-style-type: none"> <li>• Store all the data in the respective variables</li> <li>• Check if the transactions in current hour are equal to or greater than 3. If true, flag the transaction</li> <li>• Check if today's total transaction amount becomes equal to or greater than the daily limit, flag as suspicious.</li> <li>• Check if the location and time is unusual wrt user's usual behavior. If true, flag the transaction.</li> <li>• Otherwise proceed and add the transacted amount to today's transaction amount (increment).</li> </ul>	<p>INPUT</p> <p>IF-THEN</p> <p>IF-THEN</p> <p>IF THEN</p> <p>ELSE</p>	<ul style="list-style-type: none"> <li>• Flag the transaction according to the program.</li> <li>• If transaction successful, increment the transacted amount to today's transaction amount.</li> </ul>

## **Algorithm:**

Step 1: Check for number of transactions within last hour, location of transaction, time of transaction, and withdrawal amount.

Step 2: If the transactions exceed 3, flag as suspicious and end.

Step 3: If the transaction amount exceeds daily limit, flag as suspicious and end.

Step 3: If the location and time of the transactions are unusual and suspicious, flag as suspicious and end

Step 4: Else proceed with the transaction and add the transacted amount to today's transaction amount and print "Transaction Successful".

## **Pseudo Code:**

START

1. GET num\_transactions\_last\_hour for user from the database.
2. GET daily\_limit for user\_id from the database.
3. GET today\_transaction\_amount for user from the database.
4. CHECK IF num\_transactions\_last\_hour > 3:
  - FLAG transaction as suspicious.
  - PRINT "Suspicious transaction: More than 3 transactions in the last hour."
  - END
5. ELSE IF transaction\_amount > daily\_limit:
  - FLAG transaction as suspicious.
  - PRINT "Suspicious transaction: Amount exceeds daily limit."
  - END
6. ELSE IF unusual\_location is TRUE AND unusual\_time is TRUE:
  - FLAG transaction as suspicious.
  - PRINT "Suspicious transaction: Unusual location and time."
  - END
7. ELSE:
  - ADD transaction\_amount to today\_transaction\_amount.
  - UPDATE today\_transaction\_amount in the database.

- PRINT "Transaction Successful."
- END

END

**Flowchart:**