Phase 5 – Apex Programming (Developer)

Project: *NeuroWell – Intelligent Mental Wellness & Early Detection CRM*

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1. Apex Classes and Objects

Use Case: Calculate and categorize risk levels dynamically.
Description:
A class named WellnessUtility was created to evaluate patient data and determine their risk category based on the average stress score. The method calculateRiskLevel() returns *Low*, *Moderate*, or *High* depending on the numeric range.
Business Impact: Ensures consistent and automated risk assessment across the organization.

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2. Apex Triggers (Before/After Insert/Update/Delete)

Use Case: Automatically assign a risk level on record creation.
Description:
A trigger named WellnessTrigger on the *Wellness Record* object executes before insert and update events. It sets the Risk_Level__c field using conditional logic:

- Stress Score > 70 → High
- Stress Score between 40–70 → Moderate
- Stress Score < 40 → Low
  Business Impact: Reduces manual data entry and ensures accurate categorization of every wellness record.

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3. Trigger Design Pattern

Use Case: Maintain code modularity and reusability.
Description:
The trigger follows the *Trigger Handler Pattern*, where all logic is encapsulated in a separate handler class WellnessTriggerHandler. This keeps the trigger lightweight and allows easy maintenance.
Business Impact: Improves scalability and adherence to clean-code practices.

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4. SOQL & SOSL Queries

Use Case: Retrieve and search for patient records efficiently.
Description:
SOQL queries were used to fetch patients with stress scores above a threshold, while SOSL was used to search across multiple fields like Name, Email, and Counselor Name.
Business Impact: Enables quick access to critical patient data and better reporting flexibility.

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5. Collections (List, Set, Map)

Use Case: Manage data sets for batch processing and lookup operations.
Description:
Apex collections were used to store queried records — Lists for ordered records, Sets for unique patient IDs, and Maps for linking Counselor IDs to their patients.
Business Impact: Enhances performance and simplifies operations on bulk data.

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6. Batch Apex

Use Case: Recalculate all patient risk levels periodically.
Description:
A Batch Apex class RecalculateRiskBatch was created to run weekly and recalculate the Risk_Level__c field for all active patients.
Business Impact: Keeps all patient data up-to-date automatically without manual recalculation.

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7. Queueable Apex

Use Case: Execute follow-up actions asynchronously.
Description:
Queueable Apex was used for background operations such as generating wellness summaries and sending alert notifications to counselors without blocking the main transaction.
Business Impact: Improves performance and user experience during record updates.

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8. Scheduled Apex

Use Case: Automate recurring risk recalculation.
Description:
A scheduled job was configured to run the RecalculateRiskBatch class daily at midnight.
Business Impact: Ensures daily updates of patient health data and timely alerts for high-risk cases.

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9. Future Methods

Use Case: Send follow-up emails asynchronously.
Description:
A future method @future(callout=false) was written to send confirmation or alert emails after record updates, ensuring email operations do not delay user actions.
Business Impact: Enhances responsiveness and ensures background communication efficiency.

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10. Exception Handling

Use Case: Handle and log data errors gracefully.
Description:
Try-Catch blocks were implemented in all Apex classes to handle DML and query exceptions. Any errors are logged in a custom *Error Log* object for review.
Business Impact: Prevents runtime failures and provides transparency for debugging.

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11. Test Classes

Use Case: Verify trigger and class functionality.
Description:
A test class WellnessTriggerTest was created to validate all business logic with assertions and achieve over 90% code coverage.
Business Impact: Guarantees code reliability and ensures safe deployment through successful test execution.

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12. Asynchronous Processing

Use Case: Perform time-consuming actions efficiently.
Description:
Combined Batch Apex, Future Methods, and Queueable Apex for parallel asynchronous operations like recalculations, notifications, and integration updates.
Business Impact: Improves scalability and reduces execution time during heavy data processing.

Outcome

All Apex components ensure that NeuroWell CRM runs autonomously with robust backend logic.
Automated triggers, batch processes, and scheduled jobs maintain continuous data accuracy, while asynchronous Apex ensures performance and reliability.

This phase successfully added intelligence and automation at the programmatic level to the CRM.

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1. Validation Rules

Use Case: Maintain data integrity for stress scores.
Description: A validation rule was configured on the *Wellness Record* object to ensure that the Stress_Score__c value always remains between 0 and 100. This prevents entry of invalid stress readings and guarantees reliable analytics.
Business Impact: Eliminates data entry errors and keeps wellness calculations accurate.

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2. Workflow Rules

Use Case: Automate patient activation on enrollment.
Description: A workflow rule on the *Patient* object automatically updates Enrollment_Status__c to “Active” when a new record is created.
Business Impact: Reduces manual updating and ensures consistent status across the system.

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3. Process Builder

Use Case: Notify counselors of new patients.
Description: A Process Builder flow triggers whenever a Patient record is created. It sends an email alert to the assigned Primary Counselor, informing them about the new assignment.
Business Impact: Improves communication and ensures faster follow-ups.

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4. Approval Process

Use Case: Control counselor session cancellations.
Description: An Approval Process on the *Counselor Session* object routes records to the Admin when Status = “Cancelled.” The Admin reviews and approves before final update.
Business Impact: Prevents unauthorized session cancellations and maintains service quality.

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5. Flow Builder (Screen, Record-Triggered, Scheduled, Auto-Launched)

Use Case: Handle high-risk patients automatically.
Description: A Record-Triggered Flow on the *Wellness Record* object executes when Risk_Level__c = 'High'.
• Creates a Task for the assigned counselor.
• Sends an email alert and custom notification for follow-up.
Business Impact: Guarantees timely attention to critical patients without manual effort.

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6. Email Alerts

Use Case: Inform counselors of critical stress levels.
Description: Email templates and alerts were configured to notify counselors instantly whenever a patient's record is flagged as High Risk.
Business Impact: Enables immediate awareness and faster response times.

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7. Field Updates

Use Case: Mark critical patients automatically.
Description: A Field Update action changes Critical_Status__c to "Yes" when Average_Stress__c > 70.
Business Impact: Simplifies tracking of critical patients for administrators and counselors.

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8. Tasks

Use Case: Assign follow-up work to counselors.
Description: Tasks are automatically created via Flow when a patient is categorized as High Risk. The task includes subject, due date, and link to the patient record.
Business Impact: Ensures no high-risk case is missed for review or follow-up.

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9. Custom Notifications

Use Case: Provide real-time alerts inside Salesforce.
Description: A Custom Notification named "High Risk Patient Alert" was created and triggered via Flow. Counselors receive instant bell notifications in Salesforce UI whenever a patient is flagged critical.
Business Impact: Improves user engagement and reduces reliance on emails for urgent cases.

Outcome

All process automation features were successfully implemented. The combination of validation rules, workflows, approvals, and flows ensures accurate data, timely notifications, and seamless coordination among counselors and administrators. NeuroWell now functions as a self-driven CRM capable of managing patients and alerts with minimal manual effort.