1st Project Summary

Topic: Disease Prediction using AIML

Course: MCA(2024) (AI&DS)
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1st Project Summary (First Half) – Disease Prediction System Using AI/ML

The **Disease Prediction System** is designed to help users **identify possible diseases based on symptoms, analyze their severity, suggest home remedies, and recommend hospitals and doctors**. The system leverages **AI/ML algorithms** to enhance accuracy and **continuously improve over time based on user interactions**.

The project follows a structured **Software Development Life Cycle (SDLC)** approach, ensuring that all **analysis, design, and planning** phases are completed before moving to development and testing.

📌 1. Topic Selection

The project was selected due to the **growing importance of AI in healthcare**. Many individuals lack **instant access to professional medical consultations**, leading to delayed diagnoses.

🔹 Key Reasons for Choosing This Topic

- **Medical Delays**: Manual disease diagnosis can be slow and often requires a physical consultation.
- **Lack of Accessibility**: Remote areas and busy schedules prevent users from visiting doctors frequently.
- **AI/ML Capabilities**: Advances in **machine learning algorithms** allow **automated, symptom-based disease detection** with a high confidence score.
- **User-Focused Solution**: Provides **quick, personalized, and AI-driven recommendations** for immediate action.

📌 2. Requirement Gathering

To design the system, a detailed **requirement analysis** was conducted, focusing on **user interactions, input processing, and AI-based prediction models**.

🔹 Functional Requirements

✔️ Users must **select symptoms from a predefined list**.
✔️ Users can **adjust symptom opacity** (severity level).
✔️ The system should **analyze symptoms** and provide a **confidence score**.
✔️ AI should **predict disease severity** (Mild, Moderate, Severe).
✔️ Home remedies should be **suggested for mild cases**.
✔️ Hospital/doctor recommendations should be **given for severe cases**.
✔️ The **AI model should update dynamically** as more users interact with it.

🔹 Non-Functional Requirements

✔️ **No Database Used**: All processing happens in real-time using AI models.
✔️ **Fast Processing**: Results should be displayed in **less than 5 seconds**.
✔️ **User-Friendly UI**: Simple design with **interactive options** for symptom selection.
✔️ **Scalability**: Should handle multiple user requests **without slowdowns**.
✔️ **Security**: No user data is stored to **ensure privacy**.

📌 3. System Analysis

To understand the **problems in current medical diagnosis methods**, a thorough **gap analysis** was conducted.

🔹 Identified Problems

⚠️ **Delay in Doctor Appointments** – Users wait hours or days for a medical consultation.
⚠️ **Manual Diagnosis is Time-Consuming** – Doctors require clinical tests, increasing waiting time.
⚠️ **Lack of AI in Self-Diagnosis** – Most current systems only provide **basic symptom checkers** without machine learning.
⚠️ **Limited Accessibility** – Not everyone has **easy access to hospitals**, especially in rural areas.

🔹 How the Project Solves These Problems

✅ **AI-Driven Symptom Analysis** – Users get a **disease prediction in seconds**.
✅ **Severity-Based Recommendations** – The system **guides users** on whether home remedies or medical attention is needed.
✅ **No Waiting Time** – Instant **doctor/hospital recommendations** for urgent cases.
✅ **Continuous Learning Model** – The AI model **improves over time** based on new data.

📌 4. Project Planning & Gantt Chart

To ensure **smooth development**, a **detailed project timeline** was created using a **Gantt Chart**.

🔹 Key Milestones

📅 **Topic Selection & Research** – Understanding AI models for healthcare.
📅 **Requirement Analysis & System Design** – Creating **diagrams (DFD, UML, ERD, etc.).**
📅 **Model Selection & Training** – Implementing **Logistic Regression, Random Forest, KNN, and Decision Trees** for disease prediction.
📅 **Front-End UI/UX Design** – Ensuring **smooth user interaction with symptom selection tools**.
📅 **Testing & Deployment** – Verifying **accuracy and performance** before deployment.

📌 5. System Design – Software Engineering Diagrams

A set of **diagrams were created** to define the structure and flow of the system.

🔹 **Included Diagrams**

📌 **Block Diagram** – High-level representation of data flow.
📌 **Use Case Diagram** – Defines interactions between the user and system components.
📌 **Class Diagram** – Shows the **architecture of the AI prediction system**.
📌 **DFD (Level 0, 1, 2)** – **Correctly structured** to define processes, following standard software engineering rules.
📌 **ERD (Entity-Relationship Diagram)** – Represents interactions (since no database is used, it only includes AI model relations).
📌 **Activity Diagram** – Step-by-step user interaction process.
📌 **Sequence Diagram** – Defines how different components interact in a **chronological order**.
📌 **Decision Tree** – Logical steps used by the AI model to **process symptoms and make predictions**.

📌 Summary Conclusion

The **first half of the project** involves defining **the problem, gathering requirements, designing the AI system, and creating all necessary diagrams**. The next phase involves **development, implementation, and testing** to ensure **high accuracy and usability**.

🚀 **Next Steps:**
✔️ AI Model Training 🔄
✔️ UI/UX Implementation 🎨
✔️ Final Testing & Deployment ⚡