**1. Project Title, Group Name, and Group Members**

**Project Title:**

AI-Powered Personalized Healthcare Recommendation System

**Group Name:**

Team5

**Team Members:**

Anusha Pujari (11848829)

Harshini Sai Sangadi (11637776)

Ram Gopal Anne (11662303)

Rehamath Shaik (11845268)

Rohit Ibramhimpatnam (11719429)

Sai Murali Kilaru (11716190)

Vinay Kumar Parvathini (11816090)

**2. Project Description**

**Overview:**

The project we have created is an AI driven tool that gives personalized healthcare recommendations with demographic, medical or lifestyle data of an individual. The UCI Heart Disease dataset (303 rows, 14 features) is leveraged as basis for building an AI model which predicts the presence of heart disease, as well as providing actionable recommendations. Being a tool for both patients and their healthcare providers, it allows informed choices on treatments, preventive measures, and risk management.

**Key Features Include:**

**User Registration & Authentication: Secure account creation and login for different roles (patients, doctors, and admins).**

**Profile Management: Modify your personal information, medical history, and lifestyle.**

**Health Assessment & Risk Analysis: Provide AI driven risk assessments by entering health parameters.**

**Personalized Healthcare Recommendations: Specific treatment suggestions, preventative measures, and lifestyle changes.**

**Interactive charts, trends, and historical health data visualizations (source of all visualizations, charts, etc) for Dashboard for Health Insights.**

**Real time notifications & Alerts: Reminders for appointments, checkups, potential health risks sent via Email / SMS.**

**Appointment Scheduling:** Seamless booking system for medical consultations.

**Chatbot:** AI powered chatbot to answer common health related questions**.**

**Community & Support Forums:** a moderated space for peer support and shared experiences.

**Language option:** To support a multilingual audience**.**

**Emergency Contact Feature**: Add emergency contacts quicker than before, and in cases of urgency they will be alerted.

**Collect user rating and feedback:** for continuous improvement on system recommendations.

**Development Environments:**

**Programming Languages:**

**Backend:** Python (using frameworks like Flask or Django for API development and server-side logic).

**Machine Learning:** Python with libraries such as scikit-learn, TensorFlow, or PyTorch.

**Frontend:** JavaScript with modern frameworks (React or NextJs) to build responsive web interfaces.

**Database Systems:**

SQL (e.g., PostgreSQL or MySQL) or NoSQL (e.g., MongoDB) for secure data storage.

**APIs & Cloud:**

API: RESTful or GraphQL endpoints for communication between frontend and backend.

Cloud Platform: AWS, Azure, or GCP for hosting, scalability, and cloud storage.

Security: Implementation of encryption protocols (AES for data at rest, SSL/TLS for data in transit) ensuring HIPAA compliance.

**Development Tools:**

**Version Control: Git with GitHub or GitLab.**

Project Management: Kanban board (using tools like Trello, Jira, or GitHub Projects) to track progress and individual member tasks.

CI/CD: Automated testing and deployment pipelines (using GitHub Actions, Jenkins, etc.).

Monitoring & Logging: Tools like Prometheus, Grafana, or ELK Stack to monitor system performance and track anomalies.

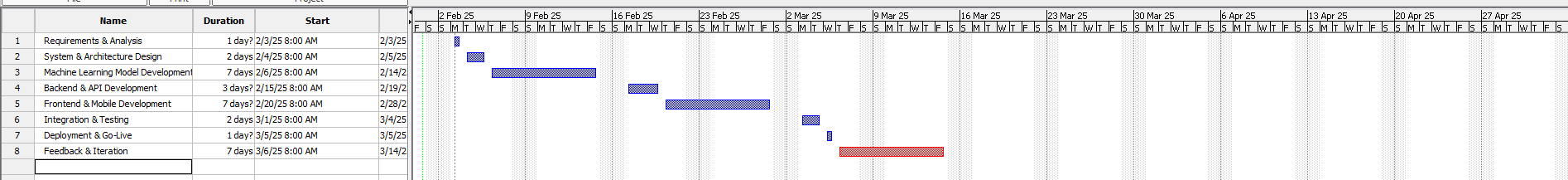
**Question 6**

**Initial Planning & Timeline**

High-Level Milestones and Timeline:

|  |  |  |  |
| --- | --- | --- | --- |
| Phase | Description | Duration | Expected Milestone Date |
| 1. Requirements & Analysis | Gather detailed requirements, define user stories, and finalize system scope. | 1 day | Week 1 |
| 2. System & Architecture Design | Develop system architecture, database design, API specifications, and UI wireframes. | 2days | Week 1 |
| 3. Machine Learning Model Development | Data preprocessing, model selection, training (using the UCI Heart Disease dataset), and validation. | 1 week | Week 2 – Week 3 |
| 4. Backend & API Development | Build the server, implement secure user authentication, and integrate AI models via RESTful APIs. | 1 week | Week 4 – Week 5 |
| 5. Frontend & Mobile Development | Develop the user interface (web and/or mobile), dashboards, and interactive features. | 2 weeks | Week 5 – Week 7 |
| 6. Integration & Testing | Integrate all components, conduct unit tests, integration tests, and user acceptance tests (UAT). | 2days | Week 7 |
| 7. Deployment & Go-Live | Set up cloud infrastructure, deploy the system, and monitor live performance. | 1day | Week 8 |
| 8. Feedback & Iteration | Collect feedback, perform bug fixes, and make iterative improvements. | Ongoing post-deployment | Continuous improvements |

**Gantt Chart (Textual Representation):**



**Kanban Board Approach:**

**To Do**: Requirement gathering, initial design sketches, model research, API planning.

**In Progress:** UI development, model training, database schema development.

**Review/Testing:** Code reviews, unit testing, integration testing.

Each team member’s tasks will be added as cards on the Kanban board with status updates tracked daily.

**7. Risk Management**

**Identified Risks & Mitigation Strategies:**

**Data Privacy & Security Risks:**

Risk: Unauthorized access or data breaches due to sensitive patient data.

Mitigation: Implement encryption standards (AES, SSL/TLS), regular security audits, and role-based access control.

**Model Performance & Accuracy:**

Risk: The AI model may underperform or produce inaccurate health risk predictions.

Mitigation: Use robust cross-validation, monitor performance metrics continuously, and allow periodic retraining with new data.

**System Scalability & Performance:**

Risk: The system might not scale with increasing user loads, leading to latency.

Mitigation: Use cloud-based autoscaling, optimize backend queries, and conduct load testing to ensure performance.

**Integration Complexity:**

Risk: Difficulties in integrating various system components (frontend, backend, ML model).

Mitigation: Use well-documented APIs, perform incremental integration tests, and adopt microservices architecture where applicable.

**Timeline Slippage:**

Risk: Unforeseen delays in development phases could push back milestones.

Mitigation: Regular sprint reviews, clear task allocation using Kanban, and buffer periods in the project timeline.

**User Adoption & Usability Issues:**

Risk: The interface or recommendations might not be user-friendly or well-received.

Mitigation: Engage in early user testing sessions, gather feedback through beta testing, and iterate on UI/UX designs.

**8. Team Member Roles**

**Roles and Responsibilities:**

**Project Manager (PM):**

Anusha Pujari

Responsibilities: Oversee the overall project timeline, coordinate team meetings, manage the Kanban board, and ensure milestones are met.

**Backend Developer & API Specialist:**

Harshini Sai Sangadi

Responsibilities: Develop the server-side logic, build secure APIs, manage database integrations, and ensure proper data encryption and security protocols.

**Machine Learning Engineer:**

Ram Gopal Anne

Responsibilities: Preprocess the dataset, develop and train the AI model, evaluate model performance, and integrate the ML model with the backend.

**Frontend Developer & UI/UX Designer:**

Rehamath Shaik

Responsibilities: Design and implement the user interface, develop interactive dashboards, and ensure the application is user-friendly and accessible.

Rohit Ibramhimpatnam

Responsibilities: collaborate with Rehamath Shaik to ensure seamless design application, ensure cross-platform compatibility, and integrate all features and making it device compatibility

**Database & Cloud Infrastructure Specialist:**

Sai Murali Kilaru

Responsibilities: Design the database schema, manage cloud infrastructure (AWS/Azure/GCP), and oversee data backup, recovery, and performance optimization.

**Quality Assurance & Testing Lead:**

Vinay Kumar Parvathini

Responsibilities: Develop testing strategies (unit, integration, and user acceptance tests), manage bug tracking, and coordinate the overall quality assurance process.

**9. Member contribution**

|  |  |  |  |
| --- | --- | --- | --- |
| Member Name | Contribution Description | Overall Contribution (%) | Note (if applicable) |
| Anusha Pujari | Coordinated the overall report structure, project description, risk management section, and high-level timeline planning. | 14% | Project Manager; oversaw integration of report. |
| Harshini Sai Sangadi | Developed the sections on system architecture, backend development environment, API design, and security protocols. | 14% | Led technical documentation for backend. |
| Ram Gopal Anne | Authored the machine learning model description, dataset analysis, and ML integration details. | 14% | Provided in-depth insights on the ML model. |
| Rehamath Shaik | Composed the user-facing functional requirements, UI/UX design, and frontend development environment description. | 14% | Focused on the frontend and user experience. |
| Rohit Ibramhimpatnam | Documented the mobile development approach, integration of mobile-specific features, and cross-platform compatibility details. | 14% | Ensured mobile development section clarity. |
| Sai Murali Kilaru | Wrote the sections on database management, cloud infrastructure, data encryption, scalability, and performance optimization. | 14% | Handled infrastructure and technical backend. |
| Vinay Kumar Parvathini | Contributed to the testing strategy, quality assurance measures, integration testing plan, and deployment overview. | 14% | Led QA and integration documentation efforts. |