Department of Computer Engineering

Academic Term: First Term 2023-24

Class: T.E /Computer Sem – V / Software Engineering

Practical No:	6
Title:	Data Flow Diagram
Date of Performance:	
Roll No:	9607
Team Members:	Sanika Patankar, Lisa Gonsalves, Eden Evelyn Charles

Rubrics for Evaluation:

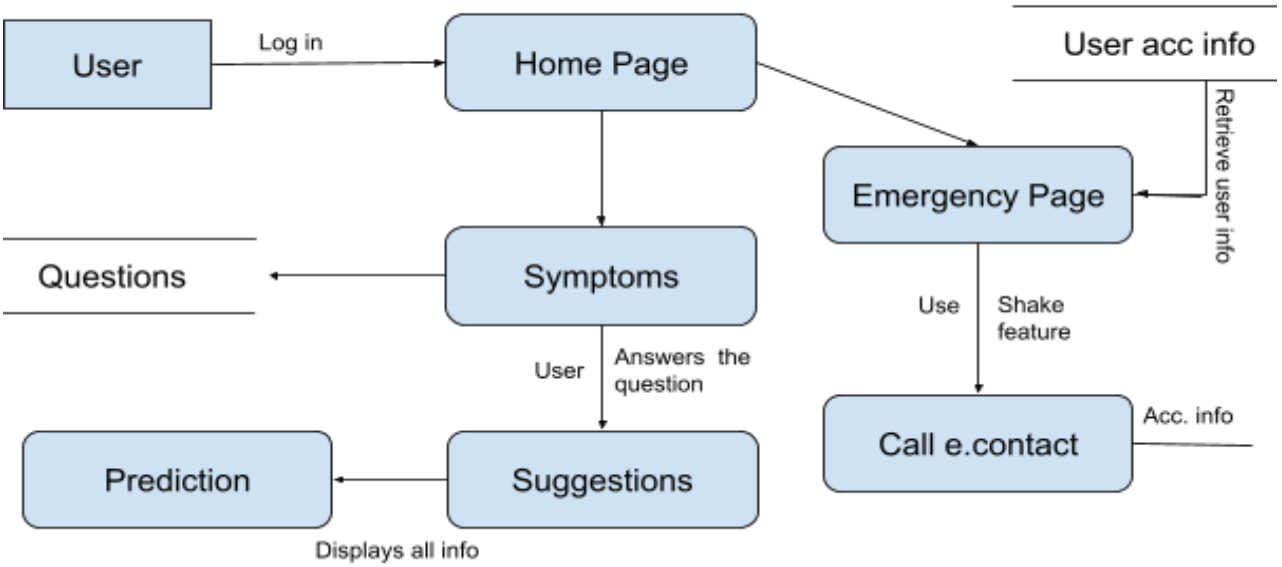
Sr. No.	Performance Indicator	Excellent	Good	Below Average	Total Score
1	On time Completion & Submission (01)	01 (On Time)	NA	00 (Not On Time)	
2	Theory Understanding (02)	02 (Correct)	NA	01 (Tried)	
3	Content Quality (03)	01 (All used)	02 (Partial)	03 (Rarely allowed)	
4	Post Lab Questions (04)	04 (Done Well)	03 (Partially Correct)	02 (Submitted)	

Signature of the Teacher:

Lisa Gonsalves
9607
TE COMPS B

SE EXP: 6 DATA FLOW DIAGRAM

For Women Safety and Period Management App



Explanation

Process

Home Page: The user logs in and is directed to the home page.
Emergency Page: The user enters the emergency page and initiates the shake feature.
Call e.contact: An call is initiated to the e.contact which is stored in user acc. info.
Symptoms: The users answer the questions based on how they feel.
Suggestions: The users are given suggestions on how to help with their symptoms.
Prediction: Displays all the information to the user.

Data Stores

User acc. Info.: Contains personal information of the user.
Questions: Contains all the questions the user needs to answer.

External Entities

User: Initiates the Home Page and Symptoms Page

Data Flows

Log in: Flows from User to Home Page.
Retrieve user info.: Flows from User acc. info. to the Emergency Page.
User uses the shake feature: Flows from Emergency Page to Call e.contact .
User answers the questions: Flows from Symptoms Page to Suggestions Page.
Displays all the info.: Flows from Suggestions Page to Prediction Page.

POSTLAB:

a) Evaluate the benefits of using Data Flow Diagrams (DFD) to analyse and visualise the data movement in a complex software system.

1. **Clarity and Simplification:**
    - Simplifies complex systems for better understanding.
2. **Effective Communication:**
    - Serves as a universal language for technical and non-technical stakeholders.
3. **Identification of Processes and Data Stores:**
    - Clearly identifies system processes and data storage.
4. **Boundary Definition:**
    - Distinguishes between internal processes and external entities.
5. **Data Transformation and Processing:**
    - Shows how data is processed and transformed within the system.
6. **Change Management:**
    - Facilitates managing system changes and updates.
7. **Error Detection and Prevention:**
    - Helps identify potential errors and bottlenecks.
8. **Scalability and Optimization:**
    - Aids in identifying areas for performance and scalability improvements.
9. **Documentation and Training:**
    - Useful for documentation and onboarding new team members.
10. **Requirements Analysis:**
    - Supports early-stage requirements gathering and system behavior definition.

b) Apply data flow analysis techniques to a given project and identify potential data bottlenecks and security vulnerabilities.

1. **Data Flow Definition:**
    - Identify key data flows within the app, including user data, location data, and emergency contact details.
2. **Create a Data Flow Diagram (DFD):**
    - Develop a DFD to visualize data flow, including processes, data stores, data flows, and external entities.
3. **Data Flow Tracing:**

    - Trace sensitive data to understand how it moves through the app.
4. **Identify Data Bottlenecks:**
    - Look for areas where data processing or transfer may cause delays or bottlenecks.
5. **Data Validation and Sanitization:**
    - Assess how the app validates and sanitizes user inputs to prevent security vulnerabilities.
6. **Data Encryption:**
    - Examine encryption standards for sensitive data in transit and at rest.
7. **Data Access Controls:**
    - Review user access controls and permissions to prevent unauthorized data access.
8. **Authentication and Authorization:**
    - Ensure secure user authentication and authorized access to sensitive features or data.
9. **Data Leakage and Privacy:**
    - Identify potential data leakage points, especially regarding period tracking and location data.
10. **External Data Sources:**
    - Assess security during interactions with external data sources or APIs.
11. **Data Backup and Recovery:**
    - Review data backup and recovery processes for data integrity and availability.
12. **Logging and Monitoring:**
    - Implement robust logging and real-time monitoring for security events.
13. **Security Audits and Testing:**
    - Conduct periodic security audits and penetration tests.
14. **Incident Response Plan:**
    - Develop an incident response plan for prompt security incident handling.
15. **Data Retention and Purge Policies:**
    - Implement data retention and purging policies to minimize data exposure.
16. **Compliance and Documentation:**
    - Ensure compliance with privacy regulations and maintain documentation of security processes.

c) Propose improvements to the data flow architecture to enhance the system's efficiency and reduce potential risks.

1. **Data Validation and Sanitization:**
    - Strengthen validation and sanitization processes.
    - Implement standardized input validation libraries.

2. **Data Encryption:**
    - Upgrade encryption protocols for data at rest and in transit.
    - Maintain robust key management practices.
3. **Access Controls:**
    - Refine access controls and follow the principle of least privilege.
    - Consider role-based or attribute-based access control.
4. **Multi-Factor Authentication (MFA):**
    - Introduce MFA for enhanced user authentication security.
5. **Secure External Data Sources:**
    - Enhance security for external data sources with validation and rate limiting.
    - Use API security tokens.
6. **Data Leakage Prevention:**
    - Implement DLP solutions and outbound data encryption.
7. **Backup and Recovery:**
    - Strengthen backup and recovery strategies.
    - Regularly test and validate backups.
8. **Logging and Monitoring:**
    - Implement comprehensive logging and real-time monitoring.
9. **Security Audits and Penetration Testing:**
    - Conduct routine security audits and penetration testing.
    - Promptly address identified vulnerabilities.
10. **User Education and Training:**
    - Educate users and staff on security best practices.
    - Provide security awareness training.
11. **Incident Response Plan:**
    - Develop a robust incident response plan with clear roles and procedures.
12. **Data Retention and Purge Policies:**
    - Implement data retention policies and regular data purging.
13. **External Dependency Assessment:**
    - Continuously assess external dependency security.
    - Keep dependencies updated and patched.
14. **Documentation and Compliance:**
    - Maintain detailed security process documentation.
    - Ensure compliance with security standards and regulations.
15. **Regular Security Reviews:**
    - Conduct periodic security reviews and risk assessments to adapt to evolving threats.