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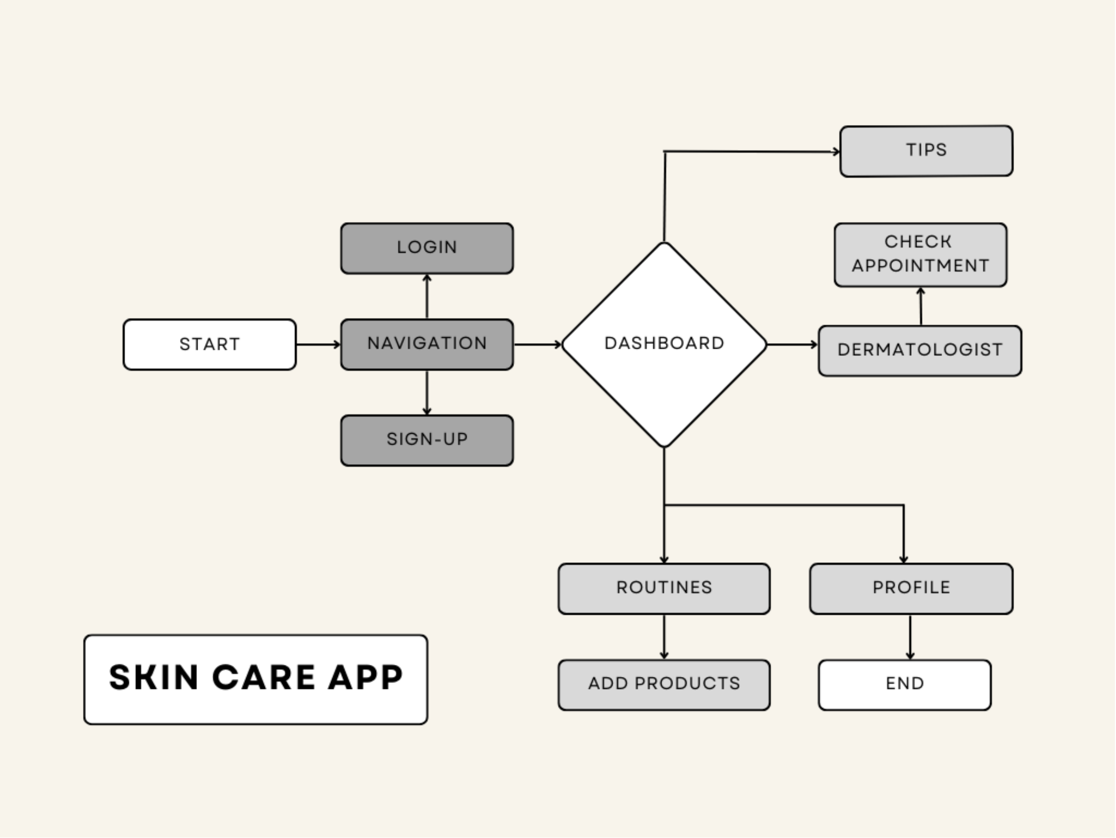
TE COMPS B

SE EXP: 5 DATA FLOW DIAGRAM

For Skin Care App:



Explanation

Login Page: The user has to register to create an account.
Dashboard: The user logs in and is directed to the dashboard.
Routines Page: The users can check their skin care routines.
Tips Page: The users can get various tips for skin care.
Dermatologist Page: The users can check their skin care appointments with the dermatologist.
Profile Page: The users can check their profile.

Data Stores

Profile Page.: 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.