**Assignment - 2**

## SE4041 – Mobile Application Design and Development          Semester 2, 2025

**Marks – Total Marks allocated 25%**                    **Deadline – November 2025**

### Part A – 15% of the Marks

Design, develop, and deploy a fully functional iOS app that incorporates advanced UI components, leverages modern iOS frameworks, and integrates at least one emerging technology (e.g., machine learning, augmented reality, IoT integration). The app should have a minimum of **three navigable screens**, employ sophisticated data persistence strategies, and adhere to best practices in mobile application development.

### Requirements:
1. **Purpose & Target Audience:**
   o Define a clear purpose for your app that solves a real-world problem or offers a unique service.
   o Identify and justify your target audience, ensuring the app's features and design meet their needs.
2. **Advanced UI Elements:**
   o Incorporate advanced user interface elements such as custom animations, transitions, gesture recognizers, and adaptive layouts.
   o Ensure the UI is responsive and provides an intuitive user experience across different devices and orientations.
3. **SwiftUI Components & Customization:**
   o Utilize a variety of SwiftUI components, demonstrating advanced customization and theming.
   o Implement at least one custom SwiftUI component or modifier.
4. **Navigation & Architecture:**
   o Implement a robust navigation structure using NavigationStack or similar patterns.
5. **Data Persistence & Networking:**
   o Implement data persistence using Core Data, Realm, or other advanced methods.
6. **Integration of Emerging Technologies:**
   o Incorporate at least one advanced iOS library or framework such as CoreML for machine learning, ARKit for augmented reality, HealthKit, or HomeKit.
   o Demonstrate meaningful integration that enhances the app's functionality.

   Appropriate use of any one of these libraries
   1. https://developer.apple.com/machine-learning/
   2. https://developer.apple.com/augmented-reality/
   3. https://developer.apple.com/maps/
   4. https://developer.apple.com/health-fitness/
   5. https://developer.apple.com/games/
   6. https://developer.apple.com/education/
   7. https://developer.apple.com/localization/

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7. **Visual Design & Branding:**
   o Develop a cohesive visual design that includes custom icons, branding elements, and a consistent color scheme.
   o Ensure accessibility standards are met, including support for Dark Mode and Dynamic Type.

8. **Testing, Debugging & Performance Optimization:**
   o Conduct testing, including unit tests, UI tests, and user acceptance testing.
   o Optimize app performance, focusing on memory management, load times, and responsiveness.

9. **Documentation & Reporting:**
   o Provide comprehensive documentation, including a user guide, technical documentation, and an in-depth report.
   o The report should discuss design decisions, development challenges, testing results, and reflections on the development process.

10. **Deployment & Presentation:**
    o Present your app in a live demonstration, highlighting key features and innovations.

Part A: Advanced iOS App (15%)- Rubric

| Criteria | Marks | Description |
|---|---|---|
| App Functionality | 15 | The app works flawlessly, with all features implemented as intended. Demonstrates advanced functionality and robustness. |
| Advanced UI & UX Design | 15 | Exceptional UI/UX design, including advanced UI elements, custom animations, and responsive layouts. Provides an outstanding user experience. |
| Code Quality & Architecture | 15 | High-quality, well-organized code following best practices. |
| Integration of Emerging Technologies | 15 | Successfully integrates advanced technologies (e.g., ML, AR). The integration enhances app functionality in meaningful ways. |
| Testing & Optimization | 10 | Comprehensive testing conducted. App is optimized for performance, with efficient memory management and fast load times. |
| Documentation & Reporting | 10 | Detailed and professional documentation. In-depth report covering all aspects of design, implementation, testing, and reflections on the development process. |
| Innovation & Creativity | 10 | Demonstrates exceptional creativity and innovation. The app offers unique features or approaches that set it apart. |
| Presentation & Deployment Readiness | 10 | Presentation is professional, clearly demonstrating the app's features and value. |

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## SE4041 – Mobile Application Design and Development          Semester 2, 2025

Part B – Innovative Application for VisionOS or tvOS (10% of the Marks)

Develop a sophisticated prototype application for VisionOS or tvOS that leverages the unique capabilities of these platforms. The prototype should demonstrate innovative use of the platform's features and provide a compelling user experience. Think creatively and propose an application that could have significant impact or market potential.

Requirements:

1. Innovative Concept Development:
   - Propose a novel app concept tailored specifically for VisionOS or tvOS, addressing a unique need or offering a new entertainment experience.
   - Find and describe existing Apps which are similar
2. Advanced Prototype Development:
   - Develop a functional prototype that showcases core features, user interactions, and platform-specific capabilities.
   - Utilize advanced features such as spatial computing for VisionOS or multi-user experiences for tvOS.
3. User Experience & Interaction Design:
   - Design intuitive and engaging user interactions, leveraging the input methods and interaction models of the chosen platform.
   - Ensure the prototype adheres to platform design guidelines and best practices.
4. Technical Implementation:
   - Demonstrate technical proficiency by integrating complex features, optimizing performance, and ensuring stability.
   - Implement code using appropriate architectural patterns and coding standards.
5. Pitch Presentation:
   - Prepare a professional pitch presentation aimed at potential investors or stakeholders.
   - The presentation should include the app's value proposition, target market, revenue model, and go-to-market strategy.
   - Present your prototype during the viva, showcasing its features and explaining its potential impact.

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## SE4041 – Mobile Application Design and Development        Semester 2, 2025

Part B: VisionOS/tvOS App- Rubric (10% of Marks)

| Criteria | Marks | Description |
|---|---|---|
| Concept Innovation | 25 | The app concept is highly innovative, with strong market potential. Addresses a unique need or provides a new kind of experience. |
| Prototype Functionality | 25 | The prototype demonstrates core functionalities effectively, showcasing advanced features of the platform. |
| User Experience Design | 15 | Provides an engaging and intuitive user experience, leveraging platform-specific interaction models. |
| Technical Proficiency | 15 | Demonstrates technical expertise in implementing platform-specific features and optimizing performance. |
| Pitch Presentation | 20 | Compelling pitch that effectively communicates the app's value proposition, market potential, and business strategy. Presentation is professional and persuasive. |

Submission Guidelines:

- Individual Assignment: This assignment must be completed individually.
- Version Control: Use a GitHub repository for each project. Ensure the repositories are well-organized, with clear commit messages, branches for feature development, and properly managed pull requests if applicable.
- Code Documentation: All code should be well-commented, following industry standards. Include a README file with instructions on how to build and run your app.
- AI-Assisted Development: If you use AI tools like GitHub Copilot or ChatGPT, document the interactions, including prompts and responses, and explain how they assisted your development process.
- Original Work: Ensure all code, designs, and content are your original work. Properly cite any third-party resources or libraries used.
- Demonstration & Viva: Be prepared to present and defend your projects during a viva session. You will be asked to discuss your design choices, implementation details, and how you addressed challenges.
- If you are referring to tutorials on the web, we still expect you to write your own code.  If the code that you submitted is similar to code available in the internet, we would suspect it to be plagiarized.

This assignment is an opportunity to demonstrate your mastery of mobile application development, your ability to innovate, and your readiness to enter the professional world. Focus on delivering high-quality, polished applications that you would be proud to showcase in a professional portfolio.

Good luck!