Functional Requirement Document (FRD)

Project Name: Diamond In The Sky - Interactive Space Learning Game for Kids

Version: 1.0

 Date: 01-10-2022

1. Introduction:

The Functional Requirement Document outlines the detailed functional specifications of the Diamond In The Sky project, an interactive space learning game designed for children aged 10 to 12 years. This document elaborates on the specific features, interactions, and behaviors of the application.

2. Functional Requirements:

2.1 Learn to Play:

Requirement ID: FR-LTP-001

Requirement: Users must be able to access the "Learn to Play" section from the main menu. Description: The application should provide a clear option for users to access educational content about stars, constellations, and the night sky.

Requirement ID: FR-LTP-002

Requirement: Educational content must cover basic astronomy concepts. Description: The content should be informative, engaging, and age-appropriate to ensure effective learning for the target audience.

2.2 Play with Stars:

Requirement ID: FR-PWS-001

Requirement: Users should be able to choose the "Play with Stars" option after completing the "Learn to Play" section. Description: Users who complete the learning phase should be able to progress to the interactive gameplay section.

Requirement ID: FR-PWS-002

Requirement: Users should be able to draw star constellations based on provided patterns. Description: The application must allow users to trace and recreate star patterns to proceed to higher levels.

Requirement ID: FR-PWS-003

Requirement: Successful completion of constellations unlocks higher levels. Description: Users should be rewarded for completing constellations accurately by gaining access to more advanced levels.

Requirement ID: FR-PWS-004

Requirement: Users must be able to modify star attributes (distance, temperature, mass) in gameplay. Description: The application should provide tools that allow users to adjust star attributes and observe the resulting changes.

2.3 Visualizing Stellar Changes:

Requirement ID: FR-VSC-001

Requirement: The application must incorporate Cepheid Variables data to predict star lifetimes and brightness variations. Description: Cepheid Variables data should be used to dynamically illustrate how star lifetimes and brightness change over time.

Requirement ID: FR-VSC-002

Requirement: The application should utilize Cataclysmic Variables data to demonstrate binary star system behavior. Description: Cataclysmic Variables data should be employed to show how stars in binary systems interact and move.

Requirement ID: FR-VSC-003

Requirement: The application should implement Light Curves to showcase changes in star brightness over time. Description: Light Curves should be visually represented to illustrate fluctuations in star brightness.

3. User Interface:

Requirement ID: FR-UI-001

Requirement: The user interface must follow material design principles. Description: The application should employ material design to ensure an intuitive and visually appealing user experience.

Requirement ID: FR-UI-002

 Requirement: Clear instructions and tooltips should be provided throughout the application. Description: The interface should guide users effectively through gameplay, providing necessary information at appropriate times.

4. Collaboration with NASA:

Requirement ID: FR-NASA-001

Requirement: Accurate astronomical data provided by NASA must be integrated into the application. Description: The application should utilize data from NASA, such as Cepheid Variables, Cataclysmic Variables, and Light Curves, to enhance the learning experience.

5. Future Enhancements:

Requirement ID: FR-FE-001

Requirement: The application should be designed with extensibility in mind for future features. Description: The architecture should accommodate future enhancements, such as community engagement features and advanced levels.

6. Conclusion:

The Functional Requirement Document outlines the specific functional requirements of the Diamond In The Sky project. These requirements detail the interactions, behaviors, and features of the application, ensuring a comprehensive and engaging space learning experience for children aged 10 to 12 years.