Interactive Pixel Art Creator with Sense HAT Project Guide

**Project Description:** Create a Python program with a GUI that allows users to create pixel art on the Sense HAT's LED display using algorithms for efficient pixel manipulation and storing pixel data in arrays/lists.

# Phase 1: Planning

### Project Objective

* + Clearly define the goal of the project.

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### Audience

* + Identify the target audience for the pixel art creator.

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### Features

* + List the features and functionalities to be included in the program

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* + Plan the overall structure of the program.

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### Timeline

* + Create a timeline that outlines the estimated duration for each phase of the project.

| **Task** | **Who** | **Status** |
| --- | --- | --- |
|  |  | Not started |
|  |  | Not started |
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|  |  | Not started |

### Resource Requirements

* + Identify the tools and libraries needed.

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# Phase 2: Design

### User Interface Design

* + Create a wireframe or mockup of the user interface using a design tool or on paper.

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### Algorithm Design

* + Define the structure and logic of the application, including how user input will affect the program.

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### Design

* + Design algorithms using flowchart or pseudocode.

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### Error Handling

* + What errors did you encounter?

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### Test Cases

* + How do you test your app?

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# Phase 3: Testing and Feedback

### GUI Feedback

* + Implement the GUI based on the design. Get feedback on it. What was the feedback? How did it help improve your design?

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### Integration Testing

* + Verify that all components work together cohesively within the app and images or drawings show up on the LED Display, get feedback.

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### User Testing

* + Invite potential users to test the app and provide feedback on its usability and functionality. Have them run through your tests that you developed then their own.

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### Bug Fixing

* + Address any issues or bugs identified during testing.

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# Phase 4: Documentation

### Usage

* + Document the usage of the program for end-users.

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### User Manual

* + Create a user manual that explains how to use the calculator app, including instructions on entering numbers, selecting operations, and interpreting the results.

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### Code Documentation

* + Document the code, including comments that explain the purpose of each function and segment of code.

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# Reflection

**1. Algorithm Development:**

* How well do the developed algorithms perform in terms of speed and resource usage?
* Were there opportunities to optimize or enhance the efficiency of the algorithms?
* To what extent did the project utilize modular design and abstraction in algorithm development?
* Did modular components facilitate easier maintenance and future enhancements?

**2. Lists/Arrays Implementation:**

* How well did the project leverage lists/arrays for storing and manipulating pixel data?
* Were there instances where a different data structure might have been more effective?
* How robust is the implementation in handling errors related to lists/arrays manipulation?
* Were there any unexpected behaviors or bugs related to data structure operations?

**3. Testing and Feedback:**

* How thorough was the testing process, and were all functionalities tested adequately?
* Were any issues identified during testing that were not apparent during development?
* How was user feedback collected and integrated into the project?
* Were there any user suggestions or concerns that significantly influenced the final product?

**4. Documentation:**

* How clear and comprehensive is the documentation provided for end-users and developers?
* Were there areas where additional documentation would have been beneficial?
* What are the potential areas for improvement in terms of features, performance, or user experience?
* How could the project be extended or enhanced in the future?