Task 4 Documentation

Ajsal Ali

Abstract—

This project presents the development of a color composing machine, implemented in Python using a Finite State Machine (FSM) approach. FSMs serve as a structured approach to modeling systems with discrete states and transitions, offering several advantages in various applications.

In Object Recognition and Tracking, FSMs provide a systematic framework for managing complex states and transitions, enhancing the efficiency and accuracy of recognition algorithms.

I. INTRODUCTION

The problem entails implementing a color composing machine using Python, utilizing a Finite State Machine (FSM) methodology. The machine operates on a cube structure with colored faces, where user inputs for coordinates and rotation angles are utilized to generate composite images based on pixel intensities. My first attempt was to build a color composing machine without using FSM,and then convert the code to FSM.

II. PROBLEM STATEMENT

The objective of the problem is to develop a color-composing machine using a Finite state machine(FSM).Initially, 3 faces(R, G,B phases) are to be pixelated using random permutation of pixel values ranging from 0 to 255. Then the machine must pixelate the RG, GB, and BR faces based on the raw index taken as input from user and rotate the face according to the rotation angle taken as input from user. Finally, the machine must ask the price and show the face according to the payment from the user.

III. FINAL APPROACH

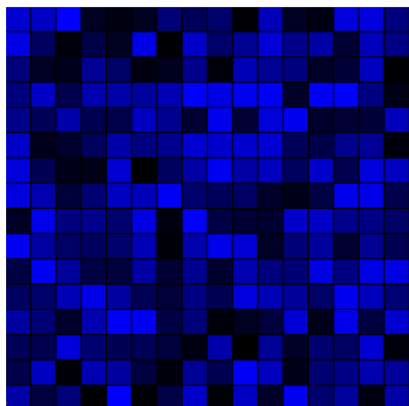Initially, the R,G,B faces were pixelated using random permutation function.
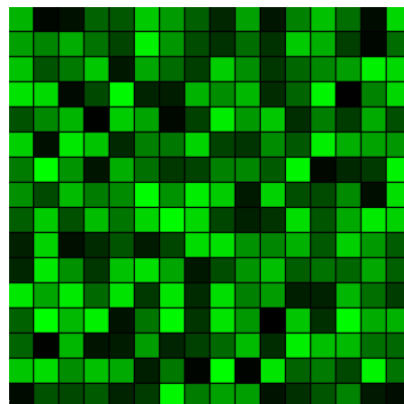
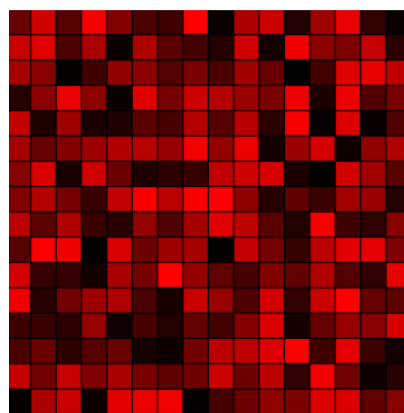

Fig. 1.   B face

Fig. 2.   Example Image

Fig. 3.   R face

After that (x,y,z) was taken as input from user to for each RG, GB, and BR faces.These faces where pixelated using the rules given in problem statement.

I was able to develop an FSM with 3 states, one state for taking input of payment and other two for pixelating and showing the faces.

CONCLUSION

Throughout the project, I encountered various challenges. The main challenge was to assign different states of the machine. Due to less knowledge of FSM, I could only develop a color composing machine with 3 states.
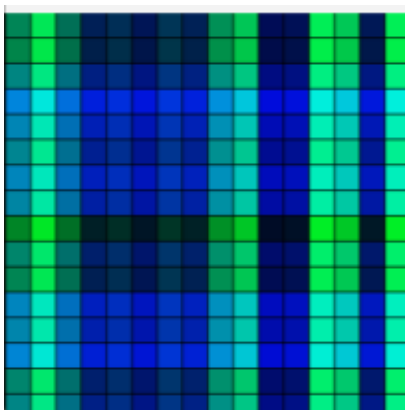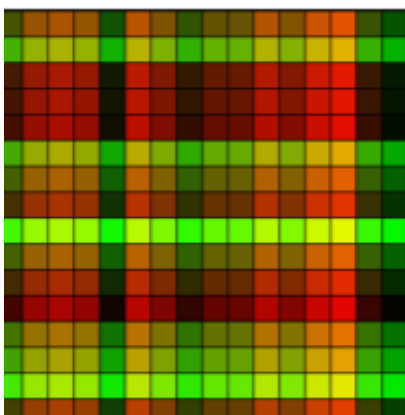
Fig. 4.　BR face

Fig. 5.　GB face

Fig. 6.　RG face