Bo Fu

Pablo Rivas

Project 2

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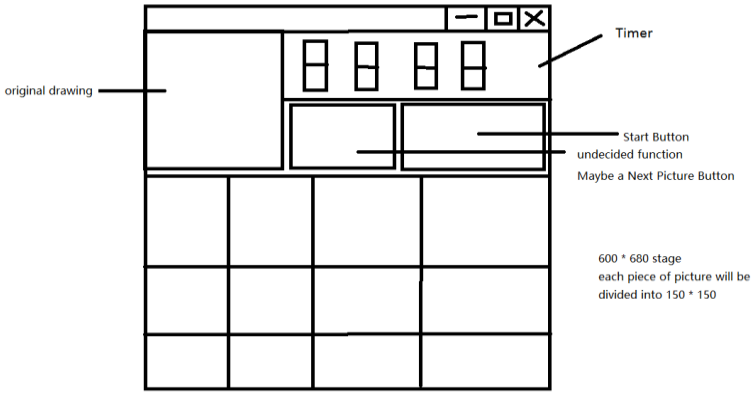
Milestone: Puzzles Game

Abstract:

The program I am going to design is a puzzles game, and within this paper, I will explain and show the process of each step from the time I come up this idea, to I finally make it.

Introduction:

The subject of Project 2 is a puzzles game. The game itself is generate random pieces of picture and people try to repair it into the original picture. I have come up to a draft layout



of the program. The motivation of design a puzzle game is I want to be a game designer in the future, and through the self-learning process, I can get deeper understanding of Java.

Detailed System Description:

The puzzles game is a game played on the 4×4 square, and a picture has divided

into 16 pieces and randomly placed on the platform but one piece is empty, so people can always switch the place of individual piece of picture in order to restore the entire picture again.

Puzzles Game
Order: int PicMatrix: int Perfection: boolean
Layout() button() Timer() RandomOrder(Order) Win(Perfection)

Here is the UML diagram, and I will explain each classes and show the interaction between them. The Order is the 15 pieces of picture and each of it will contain a number from 0 to 14. PicMatrix is the matrix of the correct order of each puzzle {{0, 1, 2, 3} {4, 5, 6, 7} {8, 9, 10, 11} {12, 13, 14}}. The Perfection is a Boolean to judge if the order for each puzzle are placed in the right place. The Layout method will be the design of where to place each button. The button method is the method to defined what function of each button has. Timer method is a method to count the time has been used and displace it. RandomOrder method is to random generate the new order of picture in Inversion. The Win method is always judge the order of puzzles, if Perfection is True, the game will end.

Requirement:

The game will be designed with using knowledge of JavaFX, multidimensional arrays. So far since we have already discuss multidimensional arrays in class, which means to create a 4 x 4 matrix which represent 15 pieces of puzzles and an empty space for the board is not so hard. The problem is in order to show program in graphic should use JavaFX. Starting from easiest part, I have learned how to show picture, how to create button in pane. I have come up a draft of the basic design, which include with the size of stage, size of picture and so on. Moreover, during my research, I find there is a problem of the puzzle game, if I random place the pictures, it will have 50% of chance that the last two picture cannot be repaired, because

they are on the opposite position. I found that if the pictures are placed obey the theory of Inversion (discrete mathematics), this problem will be solved.

Literature Survey:

With the brief understanding of the game, I find the next challenge. To create a button in pane is not hard, to create 18 buttons in the exact place is hard, I am learning this part now and I guess the way to achieve it is the borderpane.

User Manual:

Conclusion:

References: