Create – Applications From Ideas
Written Response Submission

Program Purpose and Development

2a. Provide a written response or audio narration in your video that:

- identifies the programming language;
- identifies the purpose of your program; and
- explains what the video illustrates.

(Must not exceed 150 words)

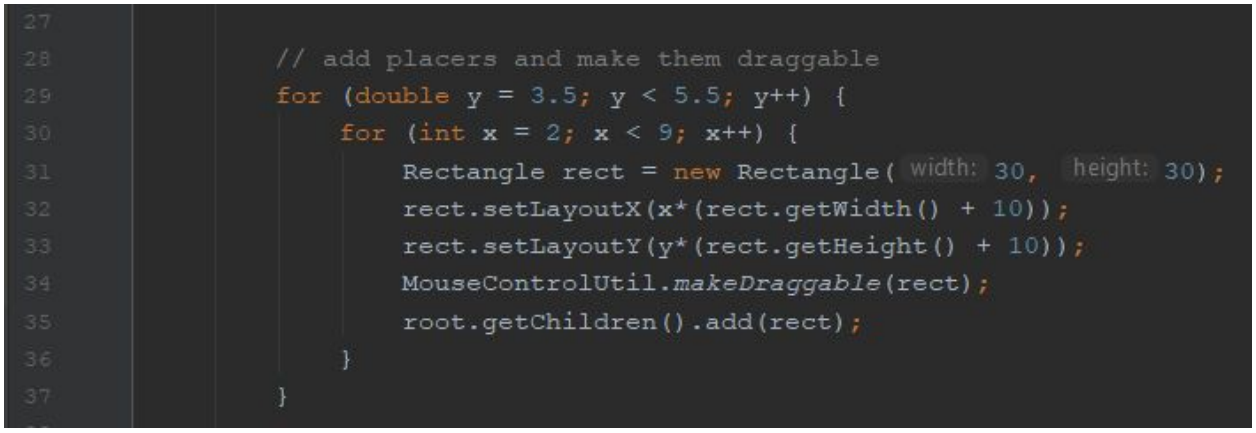
The program is a Table Manager. The program was created with the programming language Java, more specifically Java's graphical user interface software creator (JavaFX) that was developed originally by Sun Microsystems but which was acquired by Oracle. A CSS (Cascading Style Sheet) file was additionally used to make the UI look nice. The directive of the program is for the user to be able to manage what tables are currently being used at a restaurant. This program solves the problem of a seater at a restaurant having to check and count the number of seats currently available as doing so wastes time. Now, they can just drag a block over a table to show that it is currently in use and when the group leaves, the block will be removed, organizing the entire restaurant as a whole!

2b. Describe the incremental and iterative development process of your program, focusing on two distinct points in that process. Describe the difficulties and/ or opportunities you encountered and how they were resolved or incorporated. In your description clearly indicate whether the development described was collaborative or independent. At least one of these points must refer to independent program development.

(Must not exceed 200 words)

As I independently started the incremental and iterative development process of my program, there were many problems that arose with the program. The first problem that arose was making the generated blocks draggable and in-line with the user's cursor.
Another independently resolved difficulty was getting the background image to show at the right dimensions. After considering different options such as loading a BufferedImage through the ImageIcon class, I finally decided on loading the background image from a CSS file which limits the size at the same time. This also gave me the opportunity to make the UI of the program nicer through the CSS file.

2c) Capture and paste a program code segment that implements an algorithm (marked with an oval in section 3 below) and that is fundamental for your program to achieve its intended purpose. This code segment must be an algorithm you developed individually on your own, must include two or more algorithms, and must integrate mathematical and/or logical concepts. Describe how each algorithm within your selected algorithm functions independently, as well as in combination with others, to form a new algorithm that helps to achieve the intended purpose of the program. (Must not exceed 200 words)



```
27
28          // add placers and make them draggable
29          for (double y = 3.5; y < 5.5; y++) {
30              for (int x = 2; x < 9; x++) {
31                  Rectangle rect = new Rectangle( width: 30,  height: 30);
32                  rect.setLayoutX(x*(rect.getWidth() + 10));
33                  rect.setLayoutY(y*(rect.getHeight() + 10));
34                  MouseControlUtil.makeDraggable(rect);
35                  root.getChildren().add(rect);
36              }
37          }
```

This big algorithm is part of the moving the blocks function in my program, which allows the user to move blocks so that the tables in use can easily be seen. The algorithm uses logic as seen by the second parameter for both of the for loops which breaks the for loop if a certain condition is met. If this condition is not met, it proceeds to increment the variable until it is met - this is true for both loops. This helps by creating the right number of draggable blocks in the right position as to not make the blocks be either too many or too distracting or confusing. It is then sequentially increased by 1 to see if the instantiated variable, has met its condition. This algorithm with logic is a great way to visually see the table placers and see if they are being used or not.

2d) Capture and paste a program code segment that contains an abstraction you developed individually on your own (marked with a rectangle in section 3 below). This abstraction must integrate mathematical and logical concepts. Explain how your abstraction helped manage the complexity of your program. (Must not exceed 200 words)

```
46
47          Button one = new Button( text: "1");
48          Button two = new Button( text: "2");
49          Button three = new Button( text: "3");
50          Button four = new Button( text: "4");
51          Button five = new Button( text: "5");
52
53          two.setLayoutX(30);
54          three.setLayoutX(60);
55          four.setLayoutX(90);
56          five.setLayoutX(120);
57
58          root.getChildren().add(one);
59          root.getChildren().add(two);
60          root.getChildren().add(three);
61          root.getChildren().add(four);
62          root.getChildren().add(five);
63
64          one.setOnAction(
65                  e -> System.out.println("Table 1 should be free")
66          );
67
68          two.setOnAction(
69                  e -> System.out.println("Table 2 should be free")
70          );
71
72          three.setOnAction(
73                  e -> System.out.println("Table 3 should be free")
74          );
75
76          four.setOnAction(
77                  e -> System.out.println("Table 4 should be free")
78          );
79
80          five.setOnAction(
81                  e -> System.out.println("Table 5 should be free")
82          );
83
```

The abstraction that I created defined a new button on the GUI, which enables the user to keep a reminder that said table is free. This abstraction was the heart of my program, and by doing this, I was able to allow, and then use lambdas (instead of an EventHandler<T>) to map an action to the button click. This

abstraction managed the complexity of my program.