Name _____ Role (circle one) programmer/computer/project manager

Name _____ Role (circle one) programmer/computer/project manager

Name _____ Role (circle one) programmer/computer/project manager

Name _____ Role (circle one) quality control

GridMaker

Your Tasks (Mark these off as you go)

- ☐ Create a Grid and GridMaker class
- ☐ Declare variables tiles, gridDimensions
- ☐ Create the Grid constructor
- ☐ Fill the tiles array with buttons
- ☐ Write the colorAllButtons method
- ☐ Write the main method in the GridMaker class
- ☐ Create an array of colored buttons
- ☐ Have Ms. Pluska check off your Grid and GridMaker classes
- ☐ Complete challenges 1 thru 5
- ☐ Have Ms. Pluska check off your challenges 1 thru 5 before you continue
- ☐ Receive credit for this activity

☐ Create a Grid and a GridMaker class

Locate the two large sheets of paper at your assigned location

On the first sheet of paper,

- Write “Grid class” at the top of the page
- Declare the Grid class using the appropriate signature

On the second sheet of paper,

- Write “GridMaker class” at the top of the page
- Declare the “GridMaker” class using the appropriate signature.

Your papers should like the example below,

Sheet 1	Sheet 2

Grid class
`public Grid{`
 	
`//Leave lots of space here`
 	
`}`
	GridMaker class
	`public GridMaker{`
	
	`//Leave lots of space here`
	
	`}`

□ Declare the variables tiles, gridDimensions

At the top of the Grid class we will declare a private variable called tiles. This variable will be a 2-dimensional array that stores buttons. To do this write the following code at the top of the Grid class,

```
private JButton[][] tiles;
```

Before we can build our grid of tiles, we must know the dimensions of the grid. For now, we will declare the gridDimensions, but will not initialize them.

```
private int gridDimensions;
```

□ Create the Grid constructor

Before we can start creating our Grid we need a constructor. The purpose of the Grid class is to create a grid of buttons of any size. Once we know the grid dimensions, we can initialize our array of JButtons we declared above.

```
public Grid (int d){

        gridDimensions = d;
        tiles = new JButton[gridDimensions][gridDimensions]
}
```

Each portion of the constructor is defined below,

`public` – refers to the accessibility of the constructor. Because the constructor is declared as public it can be accessed by other classes.

`Grid` – refers to the name of the constructor. It must be identical to the name of the class

`int d` – refers to an int type parameter called "d". When the constructor is implemented a value for "d" must be provided.

`tiles = new new Jbutton[gridDimensions][gridDimensions]` – Initializes the tiles array to the dimensions specified whey the constructor is called.

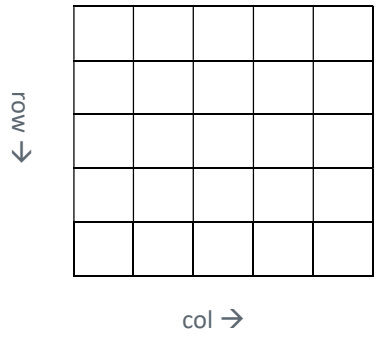
Write the Grid constructor in your Grid class.

□ Fill the tiles array with buttons

Now that we have declared our tiles array, we need to add buttons to each tile in the array. To do this, we will use a for-loop in the constructor,

```
for (int row=0; row<tiles.length; row++) {
        for (int col=0; col<tiles[row].length; col++) {
                tiles[row][col] = new JButton();
        }
}
```

The loop above creates a grid of buttons, like the one shown below,



Each portion of the for loop is defined below,

`int row = 0` – specifies where the for loop should start (index 0)

`row <tiles.length` – specifies were the loop should end (the last index in the array)

`row++` – specifies how much row should be incremented each time through the loop

`int col = 0` – specifies where the inner for loop should start (index 0)

`col <tiles[row].length` – specifies were the inner loop should end (the last index in the array)

`col++` – specifies how much col should be incremented each time through the loop

Add the for loop above to the constructor

□ Write the colorAllButtons method

Now that we have our grid of buttons, we can start making patterns. To do this, we will write code that changes the colors of the buttons. The following method can be used to change the color of all the buttons on the grid,

```
public void colorAllButtons (Color c){
        for (int row=0; row<tiles.length; row++) {
                for (int col=0; col<tiles[row].length; col++) {
                        tiles[row][col].setBackground(c);
                }
        }
```

```
}
```

Each portion of the colorAllButtons method is defined below,

`public` – refers to the accessibility of the method. Because it is declared as public it can be accessed by other classes.

`void` – means the method does not return anything.

`Color c` – is the color we want to change the button

`for-loop` – this is the same for loop as above. The purpose of the loop is to iterate over all the buttons in the tiles array

int i – refers to the index of the item to be returned

`tiles[row][col].setBackground(c)` – sets the color of the button

Write the colorAllButtons method in your Grid class

□ Write a main method in the GridMaker class

Locate your GridMaker class and write a main method like shown below,

```
public static void main(String args[]){
  //leave lots of space here!
}
```

□ Create an array of colored buttons

To create an array of buttons you simply need to call the constructor in the Grid class. To code below will create a 20 x 20 grid.

```
Grid buttonGrid = new Grid(20);
```

To color all the buttons, simply call the color all buttons method,

```
buttonGrid.colorAllButtons(Color.RED);
```

Add the code above to your main method.

Have Ms. Pluska check off your Grid and GridMaker classes before you continue

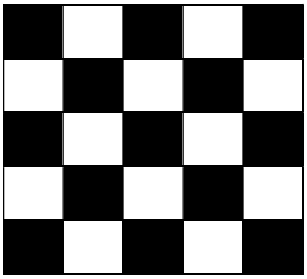
Before you continue have Ms. Pluska check off your Grid and GridMaker classes

Do not continue until you have Ms. Pluska's (or her designated TA's) signature _____

□ Complete Challenges 1 thru 5

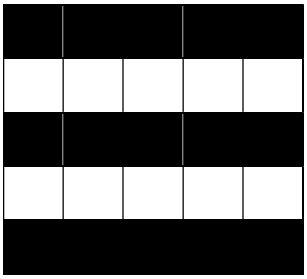
Challenge 1

Write a method called checkerBoard that creates a grid with every other square is colored, like the one shown below,



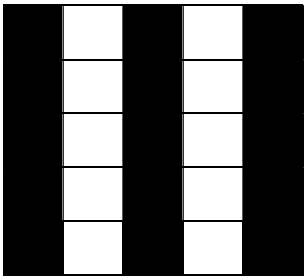
Challenge 2

Create a method called horizontalStrips that creates a grid where every other row is colored, like the one shown below,



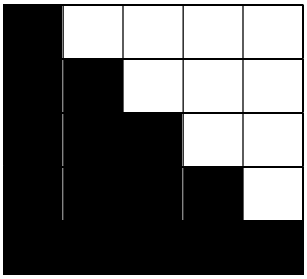
Challenge 3

Create a method called verticalStrips that creates a grid where every other column is colored, like the one shown below,



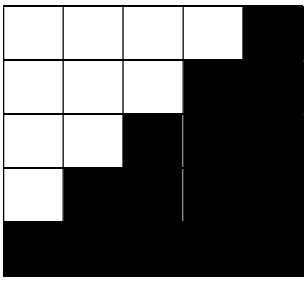
Challenge 4

Create a method called stairsRight that creates a grid like the one shown below,



Challenge 5

Create a method called stairsLeft that creates a grid like the one shown below,



☐ Have Ms. Pluska check off challenges 1 thru 5

Before you continue have Ms. Pluska check off challenges 1 thru 5.

Do not continue until you have Ms. Pluska's (or her designated TA's) signature _____

☐ Receive Credit for this Project

Submit this project guide to the needs to be graded folder to receive credit for this activity.