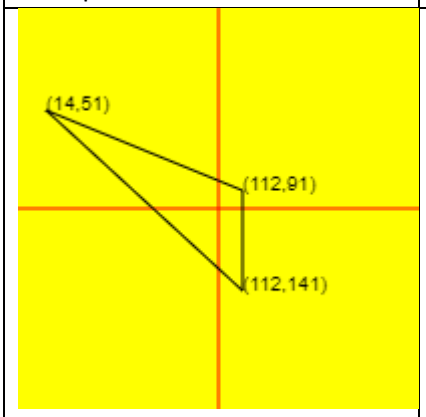
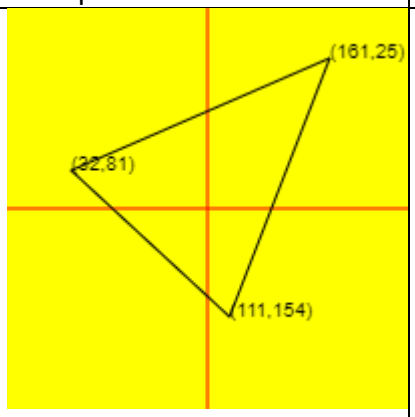
CS128 Homework #3. **Spring 2022**

Task1 (random numbers): NOTE: You must run the first cell to import the Canvas module prior to running this cell. The existing code draws a 200x300 canvas with a yellow background and two red lines that divide the canvas into 4 quadrants.

Update the code to generate 6 random integers to represent x,y values for the 3 points of a triangle. The 1st point should fall in the upper left quadrant, the 2nd point should fall in the upper right quadrant, and the 3rd point should fall in the lower right quadrant. Draw 3 black lines connecting the points. Display the 3 points of the triangle using 10pt sans-serif font as shown, with a comma separating the x and y value. It is ok if the text does not fully fit in the canvas when the point is near an edge. Do not use conditional statements for this task.

Example #1	Example #2	Example #3
		

Task2 (if-else): Prompt the user to enter a highway number. Odd numbered highways run north/south, while even numbers run east/west. The program should produce the formatted output shown below indicating the direction. Keep in mind that an even number is evenly divisible by 2 (no remainder) while an odd number has a remainder of 1.

```
enter a highway number:271
Highway 271 runs north/south.
```

```
enter a highway number:422
Highway 422 runs east/west.
```

```
enter a highway number:90
Highway 90 runs east/west.
```

Task3 (if-else): NOTE: This task is unrelated to task 2. Primary U.S. interstate highways are numbered 1-99. Auxiliary highways are numbered 100-999. An auxiliary highway services the primary highway indicated by the rightmost two digits. Thus, highway 415 services highway 15, highway 290 services highway 90, and highway 917 services highway 17.

Prompt the user to enter a highway number. You can assume the user enters a number between 1 and 999. Print whether the highway is primary or auxiliary. In addition, the auxiliary highway should indicate the primary highway that it services. HINT: use the mod function to get the rightmost two digits of a three digit number. What would you divide 942 by to get a remainder of 42?

```
enter a highway number:95
Highway 95 is a primary highway.
```

```
enter a highway number:8
Highway 8 is a primary highway.
```

```
enter a highway number:271
Highway 271 is an auxiliary highway that services highway 71.
```

```
enter a highway number:480
Highway 480 is an auxiliary highway that services highway 80.
```

Task4 (chained conditional if/elif/else): Generate a random forecast that consists of a random temperature (ranging from 30 to 50 degrees inclusive) and a random sky condition (cloudy, sunny, or overcast). Note the temperature and sky condition are unrelated. Use a chained conditional (if, elif, else) statement to test the sky condition.

```
The forecast today: 35 degrees with partly cloudy skies.
```

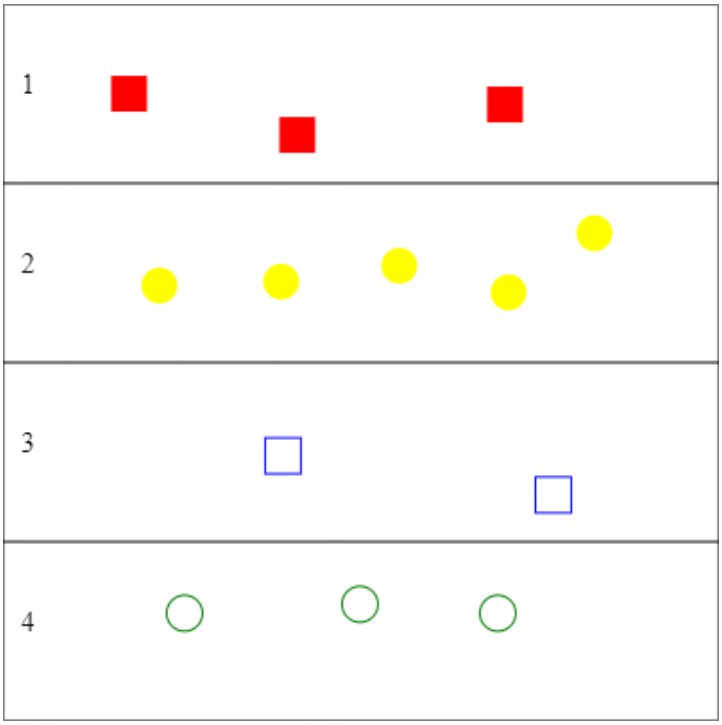
```
The forecast today: 38 degrees with sunny skies.
```

```
The forecast today: 42 degrees with sunny skies.
```

```
The forecast today: 34 degrees with overcast skies.
```

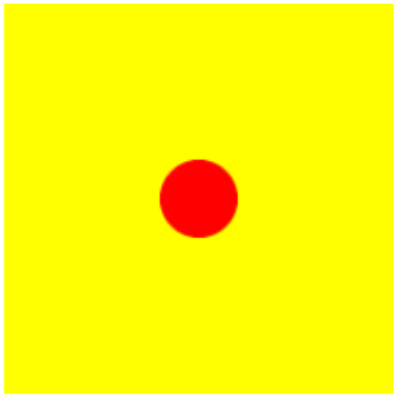
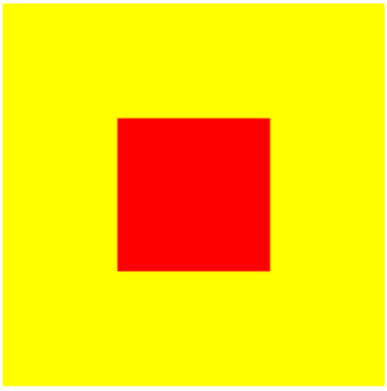
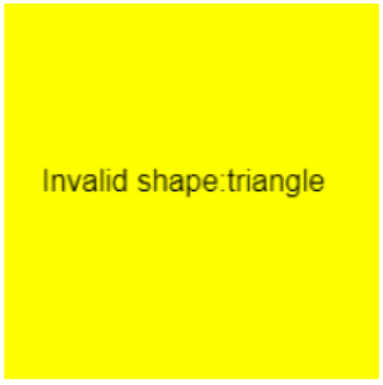
Task5 (chained conditional): NOTE: You must run the first cell to import the Canvas module prior to running this cell. The existing code draws a 400x300 canvas with black lines and numbers to demarcate 4 stacked rows.

Update the **handle_mouse_down** function to test the mouse location. Draw a red filled rectangle if the mouse is in row 1, a yellow filled circle in row 2, a blue framed rectangle in row 3, a green framed circle in row 4. Use a chained conditional to test the mouse location.



Task6 (chained conditional): NOTE: You must run the first cell to import the Canvas module prior to running this cell. The existing code draws a 200x200 canvas with a yellow background.

Prompt the user to enter a shape.

<table>
<tr><td>If the user enters ‘circle’, prompt for a radius. Draw a red filled circle with the specified radius in the middle of the canvas:</td><td>If the user enters ‘square’, prompt for the size. Draw a red filled square with the specific size (i.e. width = height = size) in the middle of the canvas:</td></tr>
<tr><td> 
Enter shape (circle or square):circle
Enter radius:20</td><td> 
Enter shape (circle or square):square
Enter size:80</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Is the user enters a value that is not ‘circle’ or ‘square’, display an error message in the canvas:</td><td></td></tr>
<tr><td> 
Enter shape (circle or square):triangle</td><td></td></tr>
</table>

Save your notebook before exporting. Submit hw3.ipynb and hw3.pdf to Canvas.