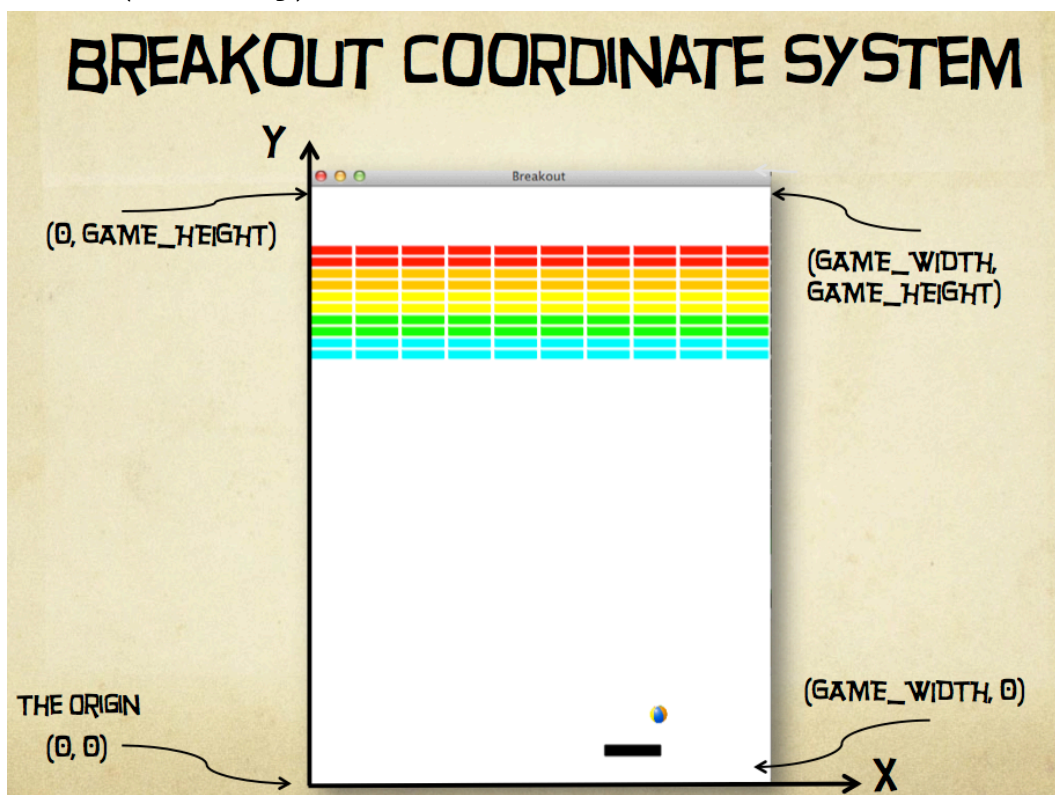


BREAKOUT CHEAT SHEET

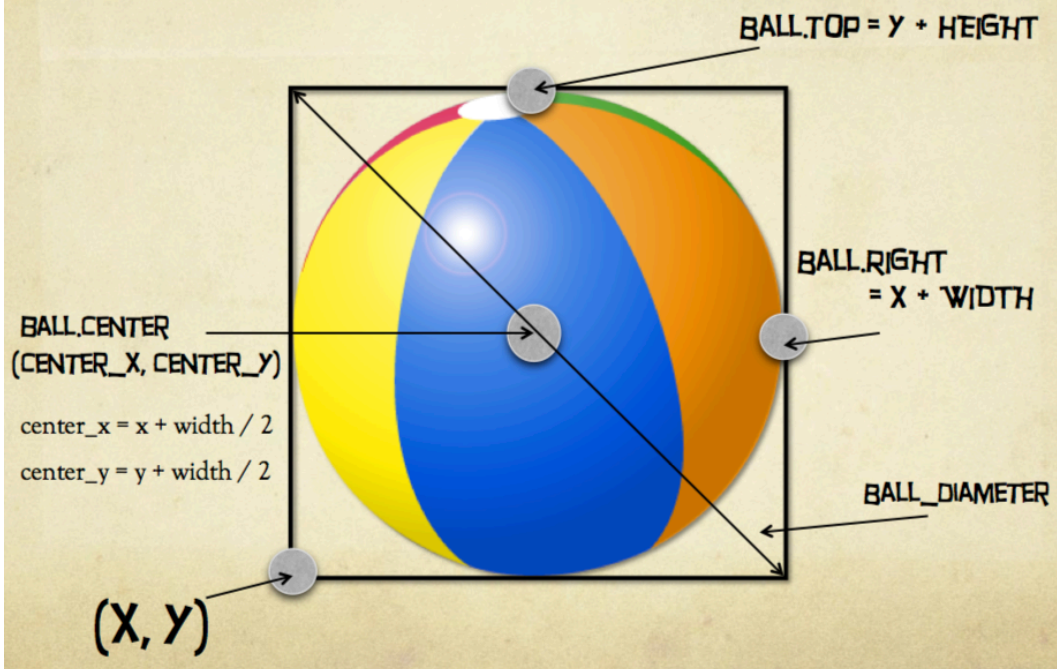
WANTAGH TECHDAY CS.003

- 1) Constants – a variable whose associated value cannot be altered by the program
 - a. `GAME_WIDTH = 480`
 - b. `GAME_HEIGHT = 620`
 - c. Breakout Documentation: <http://i6.cims.nyu.edu/~pjm419/techDay>
- 2) Paddle – the paddle has several attributes/methods associated with it that can be used to facilitate the coding process
 - a. `PADDLE_WIDTH = width of the paddle = 58`
 - b. `PADDLE_HEIGHT = height of the paddle = 11`
 - c. `self._paddle.x = x position of the paddle (specifically, the lower left corner)`
 - d. `self._paddle.y = y position of the paddle (specifically, the lower left corner)`
 - e. `self._paddle.center_x = x coordinate of the center of the paddle.`
Invariant: Must be equal to $(x + \text{width} / 2)$
 - f. `self._paddle.center_y = y coordinate of the center of the paddle.`
Invariant: Must be equal to $(y + \text{height} / 2)$
 - g. `self._paddle.right = position of the right the paddle. Invariant:`
Must be equal to $(x + \text{width})$
 - h. `self._paddle.top = position of the top of the paddle. Invariant:`
Must be equal to $(y + \text{height})$
 - i. `self._paddle.collide_point(x, y) = returns True if (x, y) is inside (touching) the paddle`
- 3) Ball – the ball has several attributes/methods associated with it that can be used to facilitate the coding process
 - a. `self._ball.vx = the velocity of the ball in the x direction`

- b. `self._ball.vy` = the velocity of the ball in the y direction
 - c. `self._ball.x` = x position of the ball (specifically, the lower left corner)
 - d. `self._ball.y` = y position of the ball (specifically, the lower left corner)
 - e. `self._ball.center_x` = x coordinate of the center of the ball.
Invariant: Must be equal to $(x + \text{width} / 2)$
 - f. `self._ball.center_y` = y coordinate of the center of the ball.
Invariant: Must be equal to $(y + \text{height} / 2)$
 - g. `self._ball.right` = position of the right the ball. Invariant: Must be equal to $(x + \text{width})$
 - h. `self._ball.top` = position of the top of the ball. Invariant: Must be equal to $(y + \text{height})$
 - i. `self._ball.collide_point(x, y)` = returns *True* if (x, y) is inside (touching) the paddle
- 4) Bricks – the bricks have several attributes/methods associated with them that can be used to facilitate the coding process
- a. `BRICK_COLORS` = [`colormodel.RED`, `colormodel.ORANGE`, `colormodel.YELLOW`, `colormodel.GREEN`, `colormodel.CYAN`]
 - b. `self._bricks[i].collide_point(x, y)` = returns *True* if (x, y) is inside (touching) the brick



BREAKOUT BALL



BREAKOUT PADDLE

