

Conditional Programming



What is our GOAL for this MODULE?

We used conditional programming to add control to the ball's movements. We built a little game using the ball's movements and added some challenge to it.

What did we ACHIEVE in the class TODAY?

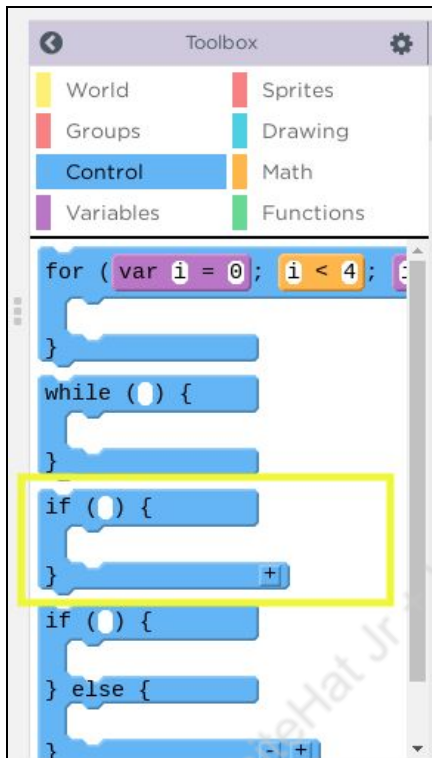
- Used conditional programming to add control to the ball's movements if a certain condition holds true.
- Made a challenging game using the ball's movements.

Which CONCEPTS/ CODING BLOCKS did we cover today?

- If block
- Keyboard Events

How did we DO the activities?

1. Find the **if conditional** block.
 - We use this instruction to tell the computer - if this condition happens, do these things.



2. Put the condition inside "(" and statements/instructions we want the computer to run if that condition is met inside "{"

```
1 var ball = createSprite(200,200,10,10);
2
3 ball.velocityY = 2;
4 ball.velocityX = 2;
5
6 function draw() {
7   background("white");
8
9   if () {
10
11 }
12
13
14 createEdgeSprites();
15 ball.bounceOff(edges);
16 drawSprites();
17 }
18
```

Code:

```
1 var ball = createSprite(200,200,10,10);
2
3 ball.velocityY = 2;
4 ball.velocityX = 2;
5
6 function draw() {
7   background("white");
8
9   if () {
10
11 }
12
13
14 createEdgeSprites();
15 ball.bounceOff(edges);
16 drawSprites();
17 }
18
```

```
1 var ball = createSprite(200,200,10,10);
2
3 ball.velocityY = 2;
4 ball.velocityX = 2;
5
6 function draw() {
7   background("white");
8
9   if (condition) {
10     //do this
11     //do this
12   }
13
14
15   createEdgeSprites();
16   ball.bounceOff(edges);
17   drawSprites();
18 }
19
```

```
1 var ball = createSprite(200,200,10,10);
2
3 ball.velocityY = 2;
4 ball.velocityX = 2;
5
6 function draw() {
7   background("white");
8
9   if (up arrow key is pressed) {
10     //do this
11     move the ball up
12   }
13
14
15   createEdgeSprites();
16   ball.bounceOff(edges);
17   drawSprites();
18 }
```

3. Next is applying conditional programming to control the movements of the ball
Remember we made the ball using sprite commands in the last lesson and animated it.

```
1 var ball = createSprite(200,200,10,10);
2
3 ball.velocityY = 2;
4 ball.velocityX = 2;
5
6 function draw() {
7   background("white");
8
9   if (keyDown("UP_ARROW")) {
10    ball.velocityX = 0;
11    ball.velocityY = -2;
12  }
13
14  if (keyDown("DOWN_ARROW")) {
15    ball.velocityX = 0;
16    ball.velocityY = 2;
17  }
18
19
20 createEdgeSprites();
21 ball.bounceOff(edges);
22 drawSprites();
23 }
```

4. Write another IF block to make the ball go down when the down key is pressed.

```
1 var ball = createSprite(200,200,10,10);
2
3 ball.velocityY = 2;
4 ball.velocityX = 2;
5
6 function draw() {
7   background("white");
8
9   if (keyDown("UP_ARROW")) {
10    ball.velocityX = 0;
11    ball.velocityY = -2;
12  }
13
14  if (keyDown("DOWN_ARROW")) {
15    ball.velocityX = 0;
16    ball.velocityY = 2;
17  }
18
19
20 createEdgeSprites();
21 ball.bounceOff(edges);
22 drawSprites();
23 }
24
```

5. Create a small Maze.



```
1 var ball = createSprite(200,200,10,10);
2 ball.velocityX = 2;
3 ball.velocityY = 3;
4
5 ball.shapeColor = 'blue';
6
7 var wall1 = createSprite(10,50,20,100);
8 wall1.shapeColor = 'red';
9
10 var wall2 = createSprite(50,50,20,100);
11 wall2.shapeColor = 'green';
12
13
14 var wall3 = createSprite(50,130,100,20);
15 wall3.shapeColor = 'brown';
16
17 function draw() {
18     background("white");
19
20     if(keyDown("up")){
21         ball.velocityX = 0;
22         ball.velocityY = -2;
23     }
24
25     if(keyDown("down")){
26         ball.velocityX = 0;
27         ball.velocityY = 2;
28     }
29 }
```

6. Use `sprite.isTouching` property to check if the ball is touching one of the walls.
7. If the ball is touching one of the walls, change the position of the ball to its starting point.
8. Repeat this for all the walls in the maze.

```
1 var ball = createSprite(200,200,10,10);
2 ball.velocityX = 2;
3 ball.velocityY = 3;
4
5 ball.shapeColor = 'blue';
6
7 var wall1 = createSprite(10,50,20,100);
8 wall1.shapeColor = 'red';
9
10 var wall2 = createSprite(50,50,20,100);
11 wall2.shapeColor = 'green';
12
13 var wall3 = createSprite(50,130,100,20);
14 wall3.shapeColor = 'brown';
15
16
17 function draw() {
18     background("white");
19
20     if(ball.isTouching(wall1)){
21         ball.x = 200;
22         ball.y = 200;
23     }
24
25
26     if(keyDown("up")){
27         ball.velocityX = 0;
28         ball.velocityY = -2;
29     }
```



```
10 var wall1 = createSprite(50,50,20,20);
11 wall2.shapeColor = 'green';
12
13 var wall3 = createSprite(50,130,100,20);
14 wall3.shapeColor = 'brown';
15
16
17 function draw() {
18   background("white");
19
20   if(ball.isTouching(wall1)){
21     ball.x = 200;
22     ball.y = 200;
23   }
24
25   if(ball.isTouching(wall2)){
26     ball.x = 200;
27     ball.y = 200;
28   }
29
30   if(ball.isTouching(wall3)){
31     ball.x = 200;
32     ball.y = 200;
33   }
34
35
36
37   if(keyDown("up")){
38     ball.velocityX = 0;
39     ball.velocityY = -2;
```

9. Use || operator to combine all the conditions.

```

11 wall2.shapeColor = 'green';
12
13 var wall3 = createSprite(50,130,100,20);
14 wall3.shapeColor = 'brown';
15
16
17 function draw() {
18   background("white");
19
20   if(ball.isTouching(wall1) || ball.isTouching(wall2) || ball.isTouching(wall3)){
21     ball.x = 200;
22     ball.y = 200;
23   }
24
25
26   if(keyDown("up")){
27     ball.velocityX = 0;
28     ball.velocityY = -2;
29   }
30
31   if(keyDown("down")){
32     ball.velocityX = 0;
33     ball.velocityY = 2;
34   }
35
36   if(keyDown("left")){
37     ball.velocityX = -2;
38     ball.velocityY = 0;
39   }

```

10. Scramble the keys and the direction in which they take the ball:

```

1 var ball = createSprite(200,200,10,10);
2 var target = createSprite(330,10,80,10);
3
4 ball.velocityY = 2;
5 ball.velocityX = 2;
6
7 function draw() {
8   background("white");
9
10  if (keyDown("LEFT_ARROW")) {
11    ball.velocityX = 0;
12    ball.velocityY = -2;
13  }
14
15  if (keyDown("RIGHT_ARROW")) {
16    ball.velocityX = 0;
17    ball.velocityY = 2;
18  }
19
20  if (keyDown("DOWN_ARROW")) {
21    ball.velocityX = -2;
22    ball.velocityY = 0;
23  }
24
25  if (keyDown("UP_ARROW")) {
26    ball.velocityX = 2;
27    ball.velocityY = 0;
28  }
29
30  text("Push me out of screen", 270, 30);
31

```

11. Bonus: You can create obstacles in your game!

```
1 var ball = createSprite(200,200,10,10);
2 var target = createSprite(330,10,80,10);
3 var obstacle1 = createSprite(10,50,300,10);
4 var obstacle2 = createSprite(320,50,250,10);
5
6 ball.velocityY = 2;
7 ball.velocityX = 2;
8
9 function draw() {
10   background("white");
11
12   ball.collide(obstacle1);
13   ball.collide(obstacle2);
14
15   if (keyDown("LEFT_ARROW")) {
16     ball.velocityX = 0;
17     ball.velocityY = -2;
18   }
19
20   if (keyDown("RIGHT_ARROW")) {
21     ball.velocityX = 0;
22     ball.velocityY = 2;
23   }
24
25   if (keyDown("DOWN_ARROW")) {
26     ball.velocityX = -2;
27     ball.velocityY = 0;
28   }
```

What's next?:

We will make the game a little more challenging by adding more objects.

EXTEND YOUR KNOWLEDGE

- If statements
<https://studio.code.org/docs/applab/ifBlock/>