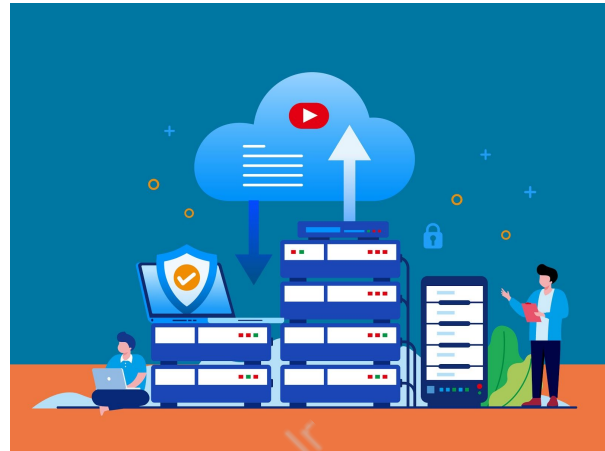## REALTIME DATABASE

What is our GOAL for this MODULE?

We used our knowledge about real-time databases to create a multiplayer game.

What did we ACHIEVE in the class TODAY?

- Learned to create databases.
- Learned to read and write data into a remote database.
- Debugged the error while pressing the arrow key.

Which CONCEPTS/CODING BLOCKS did we cover today?

- Firebase database.
- Debugging.

How did we DO the activities?

1. Design a moving ball which is controlled by the key event.

Sketched file code:

```
JS sketch2.js ▸ ⊕ draw
1    var ball;
2
3    function setup(){
4        createCanvas(500,500);
5        ball = createSprite(250,250,10,10);
6        ball.shapeColor = "red";
7    }
8
9    function draw(){
10       background("white");
11       if(keyDown(LEFT_ARROW)){
12           changePosition(-1,0);
13       }
14       else if(keyDown(RIGHT_ARROW)){
15           changePosition(1,0);
16       }
17       else if(keyDown(UP_ARROW)){
18           changePosition(0,-1);
19       }
20       else if(keyDown(DOWN_ARROW)){
21           changePosition(0,+1);
22       }
23       drawSprites();
24   }
25
26   function changePosition(x,y){
27       ball.x = ball.x + x;
28       ball.y = ball.y + y;
29   }
```

CSS file code:

```
# style.css ▸ ⚡ html
1    html, body {
2        margin: 0;
3        padding: 0;
4    }
5    canvas{
6        margin-left: 25%;
7        margin-right: 25%;
8        margin-top: 100px;
9        border: 2px solid ☐black;
10   }
11
12
```

2. Create a Google Firebase's RealTime Database.
   ● Go to https://console.firebase.google.com, and login with your Gmail id.
   ● Click on Create a New Project.
   ● Enter the name of your project. Accept terms and continue.
   ● Deny Google Analytics use.
   ● Visit the Database section of the dashboard and click on Create Database.
   ● Create the database in test mode for now.
   ● Add a child to create nodes which can hold the ball's x and y positions.
   ● Click on the "Project Overview". Choose Add to web to get started.
   ● Get the firebase config key.

- Add this to the index.html file along with the src library for firebase database.

```html
7    <script src="https://cdnjs.cloudflare.com/ajax/libs/p5.js/0.9.0/addons/p5.dom.min.js"></script>
8    <script src="https://cdnjs.cloudflare.com/ajax/libs/p5.js/0.9.0/addons/p5.sound.min.js"></script>
9    <script src="p5.play.js"></script>
10
11   <script src="https://www.gstatic.com/firebasejs/6.3.4/firebase-app.js"></script>
12   <script src="https://www.gstatic.com/firebasejs/6.3.0/firebase-database.js"></script>
13
14
15   <script>
16       // Your web app's Firebase configuration
17       var firebaseConfig = {
18           apiKey: "AIzaSyBYV9kWljd-8zlRsYSLGIv2zBX4MhkNAo8",
19           authDomain: "multiplayer-car-racing-game.firebaseapp.com",
20           databaseURL: "https://multiplayer-car-racing-game.firebaseio.com",
21           projectId: "multiplayer-car-racing-game",
22           storageBucket: "",
23           messagingSenderId: "936147099930",
24           appId: "1:936147099930:web:dba47c5bb648f4ef"
25       };
26       // Initialize Firebase
27       firebase.initializeApp(firebaseConfig);
28   </script>
29   <link rel="stylesheet" type="text/css" href="style.css"/>
30   </head>
31   <body>
32       <script src="sketch.js"></script>
33   </body>
34   </html>
35
```

3. Create a read and write a function to update the position change of the ball.

```javascript
1    var hypnoticBall, database;
2    var position;
3
4
5    function setup(){
6        database = firebase.database();
7        console.log(database);
8        createCanvas(500,500);
9
10       hypnoticBall = createSprite(250,250,10,10);
11       hypnoticBall.shapeColor = "red";
12
13
14       var hypnoticBallPosition = database.ref('ball/position');
15       hypnoticBallPosition.on("value", readPosition, showError);
16   }
17
18   function draw(){
19       background("white");
```

```
37
38    function readPosition(data){
39      position = data.val();
40      console.log(position.x);
41      hypnoticBall.x = position.x;
42      hypnoticBall.y = position.y;
43    }
```

```
17
18    function draw(){
19      background("white");
20
21        if(keyDown(LEFT_ARROW)){
22          writePosition(-1.0);
23        }
24        else if(keyDown(RIGHT_ARROW)){
25          writePosition(1.0);
26        }
27        else if(keyDown(UP_ARROW)){
28          writePosition(0,-1);
29        }
30        else if(keyDown(DOWN_ARROW)){
31          writePosition(0,+1);
32        }
33        drawSprites();
34
35    }
36
37    function writePosition(x,y){
38      database.ref('ball/position').set({
39        'x': position.x + x ,
40        'y': position.y + y
41      })
42    }
```

4. Identify the bug and fix it by updating the ball positions only when the position variable is defined.

```
12
13
14    var hypnoticBallPosition = database.ref('ball/position');
15    hypnoticBallPosition.on("value", readPosition, showError);
16  }
17
18  function draw(){
19    background("white");
20    if(position !== undefined)
21      if(keyDown(LEFT_ARROW)){
22        writePosition(-1,0);
23      }
24      else if(keyDown(RIGHT_ARROW)){
25        writePosition(1,0);
26      }
27      else if(keyDown(UP_ARROW)){
28        writePosition(0,-1);
29      }
30      else if(keyDown(DOWN_ARROW)){
31        writePosition(0,+1);
32      }
33      drawSprites();
34    }
35
36  }
37
38  function writePosition(x,y){
39    database.ref('ball/position').set({
40      'x': position.x + x ,
41      'y': position.y + y
42    })
43  }
```
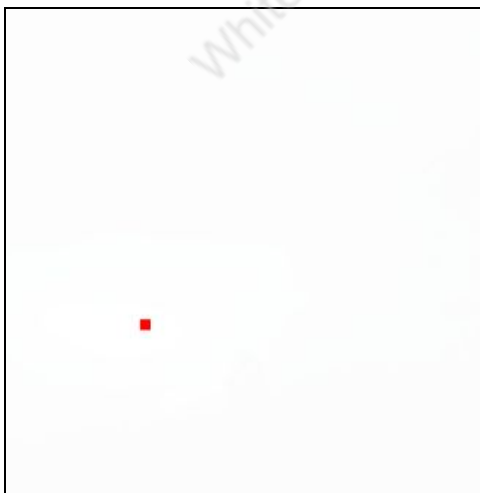
What's NEXT?

In the next class, you will be learning about structuring code prior to coding.

EXTEND YOUR KNOWLEDGE:

1. You can learn about the database through the following doc:
   https://firebase.google.com/docs