MINI PROJECT REPORT

TEAM :

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TITLE :

2048 GAME

PROBLEM DEFINITION :

- WE ARE HERE TRYING TO BUILD 2048 PUZZLE GAME , WHERE WE TRY TO ACHIEVE 2048 NUMBER IN ORDER TO WIN IT .
- 2048 IS SINGLE PLAYER GAME WHICH IS PLAYED ON 4*4 BOARD WHICH HAS TOTAL OF SIXTEEN TILES .
- YOU JOIN THE NUMBERS AND GET TO 2048 TILE .

SCOPE:

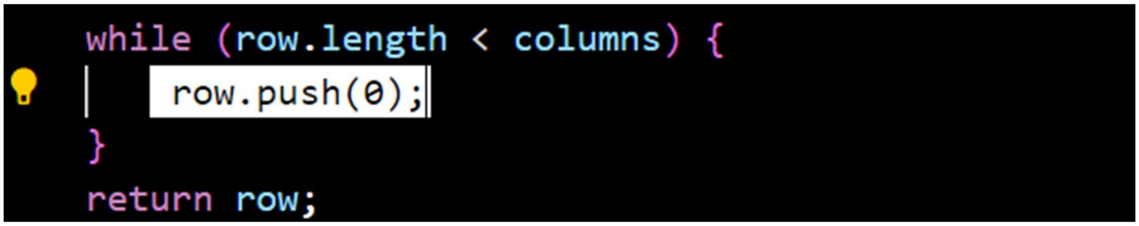
- THE PROJECT AIMS TO SIMULATES THE BOARD GAME 2048.
- WE JUST RANDOMLY SEARCHED ABOUT BOARD GAMES AND OF ALL OF THEM ,WE FOUND 2048 WAS MOST EXICITING ONE .
- IT IS A SIMPLE BOARD GAME ,TYPICALLY A SINGLE PLAYER GAME . WE MADE THIS GAME IN ORDER TO DEVELOP COORDINATION AND INCREASE OUR ABILITY SYSTEMATICALLY .
- THIS GAME IS USER FRIENDLY I.E WE HAVE CREATED AN OPTION OF UNDO , RESTART. ALSO SOUND EFFECTS HAVE BEEN ADDED TO MAKE GAME LOOK MORE APPEALING .

OBJECTIVES:

- TO CREATE THE USER FRIENDLY GAME ALSO SHOULD BE EASY TO USE.
- THE WEBSITE SHOULD USE STACK DATA STRUCTURE TO IMPLEMENT THE GAME.
- **T**HE GAME SHOULD HAVE ALL BASIC FUNCTIONALITY LIKE UNDO, RESTART, DISPLAY OF SCORE AND NO. OF MOVES .

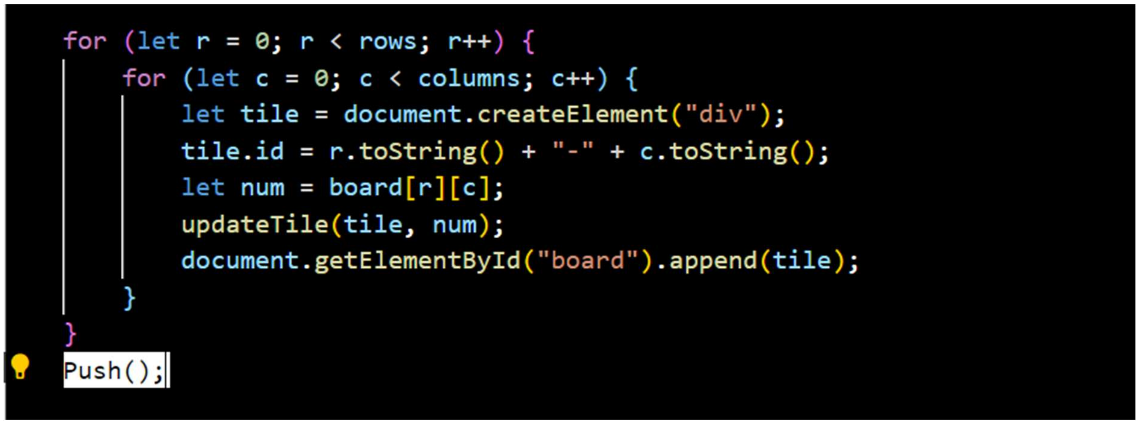
- **DATA STRUCTURES AND ITS USAGE :**
- WE HAVE USED STACK DATA STRUCTURE TO IMPLEMENT THE GAME.
- ITS A LINEAR DATA STRUCTURE WHICH FOLLOWS A PARTICULAR ORDER IN WHICH OPERATIONS ARE PERFORMED .
- IT USES STACK DATA STRUCTURE IN ADDING NUMBERS ZERO'S (PUSH OPERATION) IN A ROW AND COLUMNS AND ALSO TO RANDOMLY ADDING 2 OR 4 IN THE RANDOM TILE.

1. THE BELOW PUSH OPERATION IS ADDING ZEROS IN BLANK SPACES IN THE ROW OR COLUMN AS PER THE SHIFT USING STACK DATA STRUCTURE .



```
while (row.length < columns) {
    row.push(0);
}
return row;
```

2.THE BELOW PUSH OPERATION IS DIFFERENT FROM ABOVE ONE. THIS PUSH IS ADDING 2 OR 4 RANDOMLY IN THE ARRAY WHICH IS MADE OF BLANK SPACES IN THE BOARD.



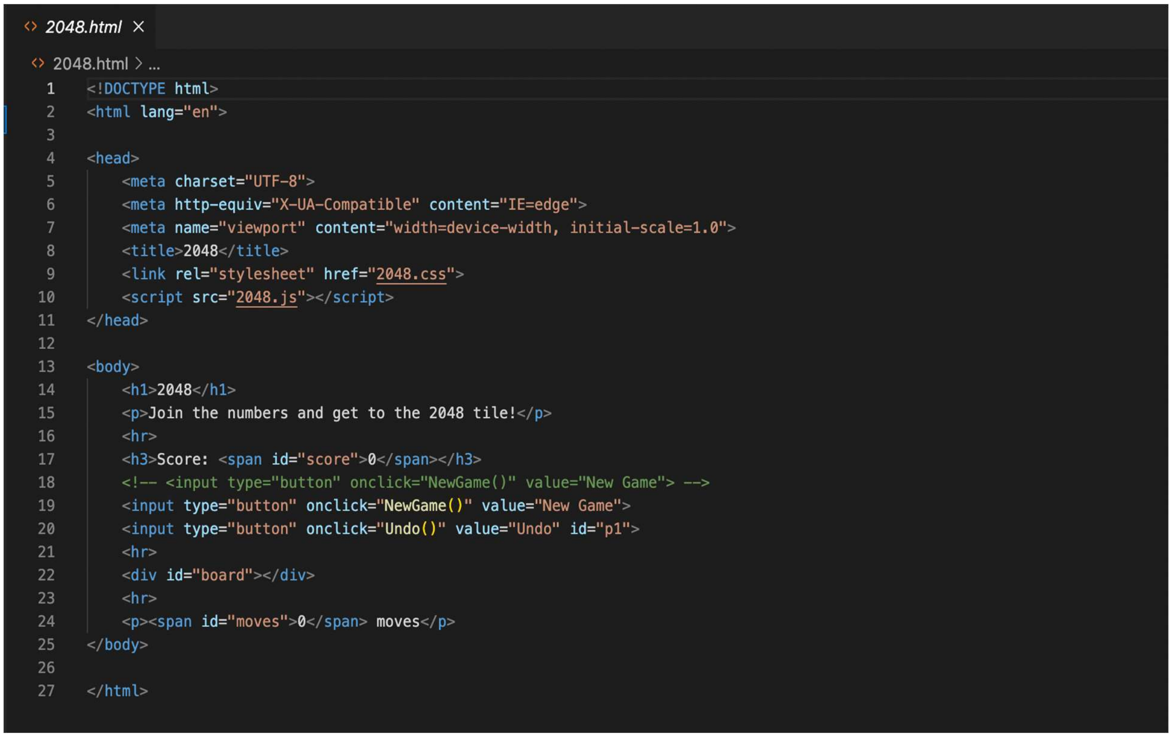
```
for (let r = 0; r < rows; r++) {
    for (let c = 0; c < columns; c++) {
        let tile = document.createElement("div");
        tile.id = r.toString() + "-" + c.toString();
        let num = board[r][c];
        updateTile(tile, num);
        document.getElementById("board").append(tile);
    }
}
Push();
```

PROJECT PLAN AND TIMELINE :

- AT FIRST WE STARTED KNOWING ABOUT REQUIREMENTS OF OUR PROJECT LIKE WHAT ALL IS NEEDED TO MAKE 2048 GAME .
- WE GOT TO KNOW WE NEED TO LEARN HTML,CSS AND JAVASCRIPT FOR IT . BOTH OF US HAVE LEARNT THAT.
- WE HAVE USED HTML FOR DESCRIBING THE STRUCTURE OF WEB PAGE LIKE SCORE ,NEW GAME BUTTON HAVE BEEN ADDED USING IT . THE LAYOUT HAS BEEN MADE USING IT .
- FOR DESIGNING PURPOSE WE HAVE USED CSS I.E COLOURS HAVE BEEN ADDED TO TILES ALSO AT VARIOUS OTHER PLACES AND LAYOUT HAS BEEN MADE TO LOOK MORE ATTRACTIVE .
- LATER ON FOR INTERACTIVE BEHAVIOUR WE HAVE USED JAVASCRIPT WHERE IN THE MAIN PURPOSE OF PROJECT , USING THE DATA STRUCTURE STACK WE HAVE CREATED THE PROJECT .
- ALL THE FUNCTIONS OF GAME LIKE SLIDING TO LEFT, RIGHT UP AND DOWN EVERYTHING HAS BEEN MADE USING JAVASCRIPT .
- FURTHER WE HAVE ALSO ADDED SOUND EFFECTS IN THE GAME I.E WHEN THE TILES COMBINE WE GET THOSE SOUNDS . AFTER ALL MAIN PURPOSE WAS TO MAKE IT USER FRIENDLY .
- AT THE END WE HAVE MADE SOME MINOR CHANGES LIKE NO. OF MOVES , BACKTRACKING AND ALL ARE ADDED .

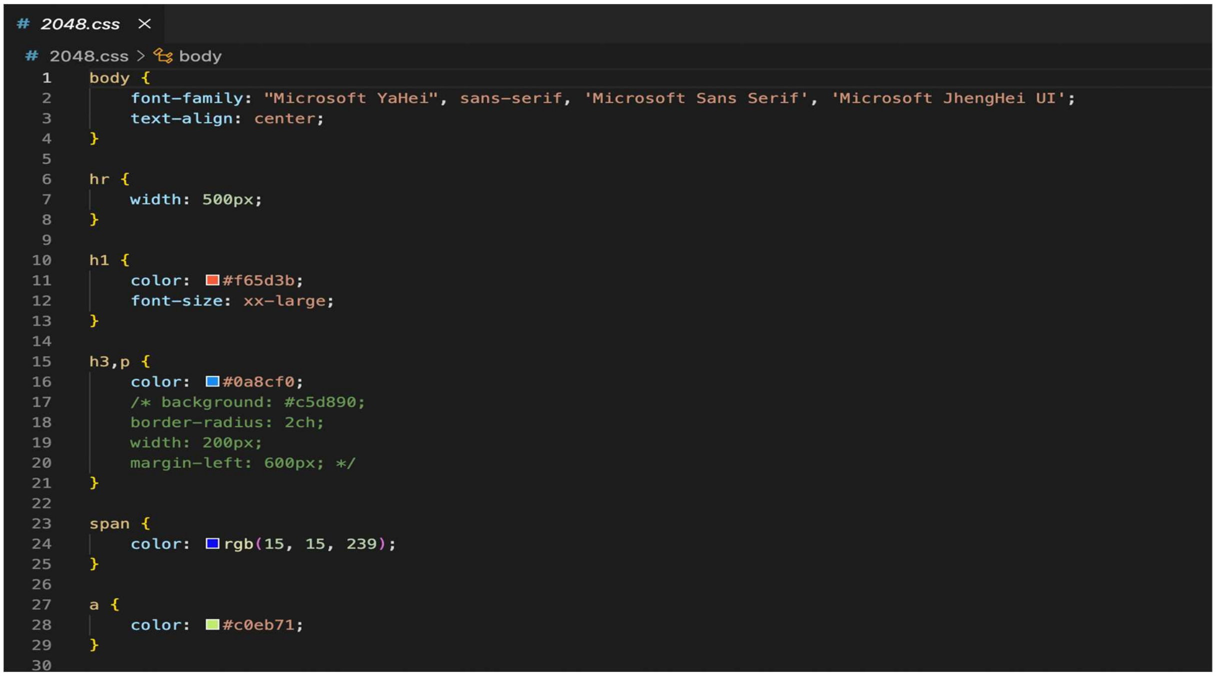
IMPLEMENTATION DETAILS :

1. HTML – FOR LAYOUT



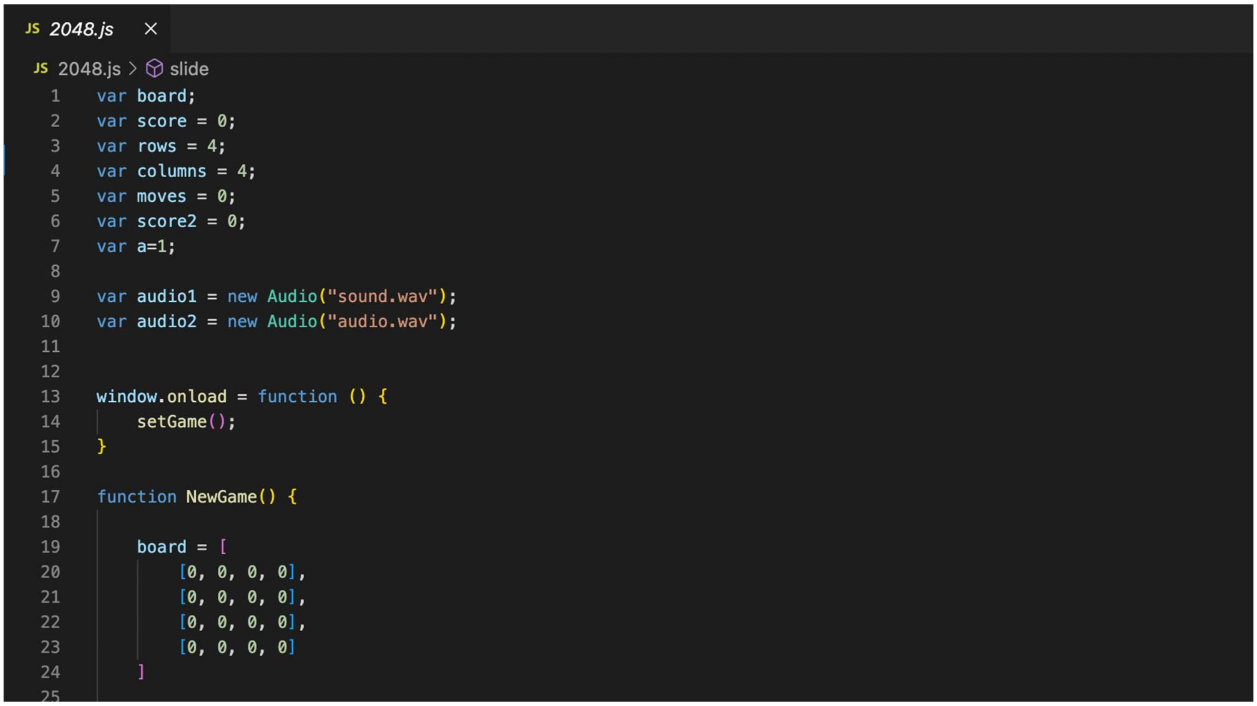
```html
<!DOCTYPE html>
<html lang="en">

<head>
    <meta charset="UTF-8">
    <meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>2048</title>
    <link rel="stylesheet" href="2048.css">
    <script src="2048.js"></script>
</head>

<body>
    <h1>2048</h1>
    <p>Join the numbers and get to the 2048 tile!</p>
    <hr>
    <h3>Score: <span id="score">0</span></h3>
    <!-- <input type="button" onclick="NewGame()" value="New Game"> -->
    <input type="button" onclick="NewGame()" value="New Game">
    <input type="button" onclick="Undo()" value="Undo" id="p1">
    <hr>
    <div id="board"></div>
    <hr>
    <p><span id="moves">0</span> moves</p>
</body>

</html>
```

2. CSS – FOR DESIGN



```css
body {
    font-family: "Microsoft YaHei", sans-serif, 'Microsoft Sans Serif', 'Microsoft JhengHei UI';
    text-align: center;
}

hr {
    width: 500px;
}

h1 {
    color: #f65d3b;
    font-size: xx-large;
}

h3,p {
    color: #0a8cf0;
    /* background: #c5d890;
    border-radius: 2ch;
    width: 200px;
    margin-left: 600px; */
}

span {
    color: rgb(15, 15, 239);
}

a {
    color: #c0eb71;
}

```

3. JAVASCRIPT – FOR INTERACTIVE BEHAVIOUR



```
var board;
var score = 0;
var rows = 4;
var columns = 4;
var moves = 0;
var score2 = 0;
var a=1;

var audio1 = new Audio("sound.wav");
var audio2 = new Audio("audio.wav");


window.onload = function () {
    setGame();
}

function NewGame() {

    board = [
        [0, 0, 0, 0],
        [0, 0, 0, 0],
        [0, 0, 0, 0],
        [0, 0, 0, 0]
    ]
```

CONCLUSION:

FROM THIS PROJECT WE HAVE LEARNT HOW TO USE HTML,CSS AND JAVASCRIPT FOR MAKING WEBSITES . ALSO THE PROJECT HAS IMMENSELY ENHANCED OUR UNDERSTANDING OF DATA STRUCTURES AND ALGORITHMS.