**Name: BARATH S**
**Reg_No: 23BCE2021**

# ASSIGNMENT – 3C

**Problem 1**

Implement the classic children's game Rock-paper-scissors. Each player in the game chooses one of rock, paper or scissors, without knowing the other player's choice. The winner is decided by a set of rules:

- Rock beats scissors
- Scissors beat paper
- Paper beats rock

If all the players choose the same thing, there is no winner for that round.

Design a webpage for the game. One of the players is the computer which chooses rock /paper /scissors at random and other players can be users or computer. When the user opts to see the result, display the winner and the score for each player.

**CODE:**

```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <title>Rock Paper Scissors</title>
   <link rel="stylesheet" href="styles.css">
</head>
<body>
 <style>
   * {
   margin: 0;
   padding: 0;
   box-sizing: border-box;
}

body {
   font-family: Arial, sans-serif;
   background-color: #f0f0f0;
```

```
    display: flex;
    justify-content: center;
    align-items: center;
    height: 100vh;
    flex-direction: column;
}

.container {
    background-color: white;
    padding: 20px;
    border-radius: 10px;
    box-shadow: 0px 5px 15px rgba(0, 0, 0, 0.1);
    text-align: center;
}

h1 {
    margin-bottom: 20px;
}

.score-board {
    display: flex;
    justify-content: space-around;
    margin-bottom: 20px;
}

.score-board div {
    font-size: 20px;
}

.choices {
    display: flex;
```

```
    justify-content: space-around;
    margin-bottom: 20px;
}

.choice-btn {
    padding: 10px 20px;
    font-size: 18px;
    margin: 10px;
    cursor: pointer;
    border: none;
    border-radius: 5px;
    background-color: #4CAF50;
    color: white;
    transition: background-color 0.3s;
}

.choice-btn:hover {
    background-color: #45a049;
}

.result {
    font-size: 24px;
    margin-bottom: 20px;
}

#play-again-btn {
    padding: 10px 20px;
    font-size: 18px;
    background-color: #f44336;
    color: white;
    border: none;
```

```
    border-radius: 5px;
    cursor: pointer;
}

#play-again-btn:hover {
    background-color: #e53935;
}
  </style>

<script>
  let playerScore = 0;
let computerScore = 0;

const choices = ['rock', 'paper', 'scissors'];

function userChoice(choice) {
    const computerChoice = getComputerChoice();
    const winner = determineWinner(choice, computerChoice);
    updateResult(winner, choice, computerChoice);
    updateScore(winner);
    document.getElementById('play-again-btn').style.display = 'inline-block';
}

function getComputerChoice() {
    return choices[Math.floor(Math.random() * choices.length)];
}

function determineWinner(playerChoice, computerChoice) {
    if (playerChoice === computerChoice) {
        return 'draw';
    }
```

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```
    if (
        (playerChoice === 'rock' && computerChoice === 'scissors') ||
        (playerChoice === 'scissors' && computerChoice === 'paper') ||
        (playerChoice === 'paper' && computerChoice === 'rock')
    ) {
        return 'player';
    } else {
        return 'computer';
    }
}

function updateResult(winner, playerChoice, computerChoice) {
    let resultText = '';
    if (winner === 'draw') {
        resultText = `It's a draw! You both chose ${playerChoice}.`;
    } else if (winner === 'player') {
        resultText = `You win! ${capitalize(playerChoice)} beats ${capitalize(computerChoice)}.`;
    } else {
        resultText = `Computer wins! ${capitalize(computerChoice)} beats ${capitalize(playerChoice)}.`;
    }
    document.getElementById('result').textContent = resultText;
}

function updateScore(winner) {
    if (winner === 'player') {
        playerScore++;
        document.getElementById('player-score').textContent = playerScore;
    } else if (winner === 'computer') {
        computerScore++;
        document.getElementById('computer-score').textContent = computerScore;
```

```
    }
}

function capitalize(str) {
    return str.charAt(0).toUpperCase() + str.slice(1);
}

function resetGame() {
    playerScore = 0;
    computerScore = 0;
    document.getElementById('player-score').textContent = playerScore;
    document.getElementById('computer-score').textContent = computerScore;
    document.getElementById('result').textContent = 'Choose your weapon!';
    document.getElementById('play-again-btn').style.display = 'none';
}

</script>
    <div class="container">
        <h1>Rock Paper Scissors</h1>

        <div class="score-board">
            <div class="player-score">
                <h2>Player</h2>
                <p id="player-score">0</p>
            </div>
            <div class="computer-score">
                <h2>Computer</h2>
                <p id="computer-score">0</p>
            </div>
        </div>
```

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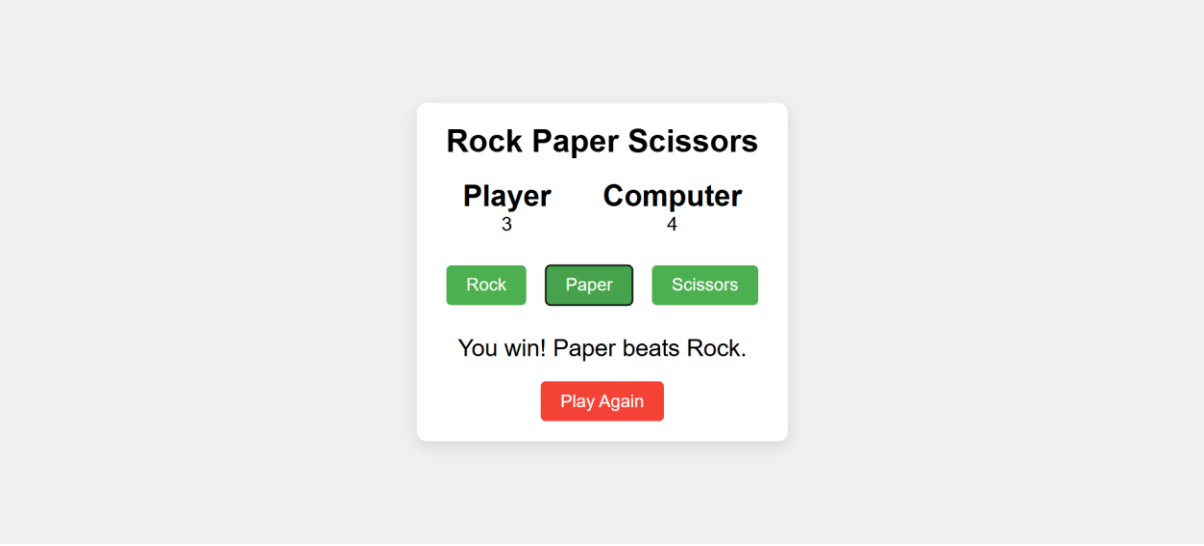
```
    <div class="choices">
      <button class="choice-btn" onclick="userChoice('rock')">Rock</button>
      <button class="choice-btn" onclick="userChoice('paper')">Paper</button>
      <button class="choice-btn" onclick="userChoice('scissors')">Scissors</button>
    </div>

    <div id="result" class="result">
      <p>Choose your weapon!</p>
    </div>

    <button id="play-again-btn" onclick="resetGame()" style="display:none;">Play Again</button>
  </div>

  <script src="script.js"></script>
</body>
</html>
```

**OUTPUT:**



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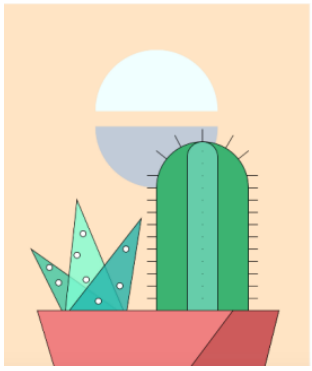
**Problem 2**

Design a HTML page which depicts in the given image using canvas.



**CODE:**

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Cactus using Canvas</title>
</head>
<body>
    <h3>Cactus using Canvas</h3>
    <canvas id="myCanvas" width="300" height="400"></canvas>
    <script>
        var canvas = document.getElementById("myCanvas");
        var ctx = canvas.getContext("2d");

        ctx.fillStyle = "#F7E7C3";
        ctx.fillRect(0, 0, canvas.width, canvas.height);

        ctx.beginPath();
        ctx.arc(150, 100, 60, 0, Math.PI, true);
        ctx.fillStyle = "white";
        ctx.fill();
        ctx.beginPath();
```

```
ctx.arc(150, 110, 60, Math.PI, 2 * Math.PI, true);
ctx.fillStyle = "lightgrey";
ctx.fill();

ctx.beginPath();
ctx.moveTo(20, 320);
ctx.lineTo(280, 320);
ctx.lineTo(240, 400);
ctx.lineTo(60, 400);
ctx.closePath();
ctx.fillStyle="#C19A6B ";
ctx.fill();
ctx.beginPath();
ctx.moveTo(220, 320);
ctx.lineTo(280, 320);
ctx.lineTo(240, 400);
ctx.lineTo(160, 400);
ctx.closePath();
ctx.fillStyle = "#A0522D";
ctx.fill();

ctx.fillStyle = "#5DAE7F";
ctx.beginPath();
ctx.moveTo(60, 320);
ctx.lineTo(45, 200);
ctx.lineTo(80, 320);
ctx.closePath();
ctx.fill();
ctx.fillStyle = "#A0C55F";
ctx.beginPath();
ctx.moveTo(60, 320);
```

```
ctx.lineTo(70, 180);
ctx.lineTo(80, 320);
ctx.closePath();
ctx.fill();
ctx.fillStyle = "#3F95C0";
ctx.beginPath();
ctx.moveTo(60, 320);
ctx.lineTo(100, 200);
ctx.lineTo(80, 320);
ctx.closePath();
ctx.fill();

ctx.fillStyle = "white";
for (let i = 0; i < 5; i++) {
   let x = 60 + Math.random() * 20;
   let y = 220 + Math.random() * 80;
   ctx.beginPath();
   ctx.arc(x, y, 3, 0, 2 * Math.PI);
   ctx.fill();
}

ctx.fillStyle = "#2E8B57";
ctx.fillRect(150, 200, 100, 120);
ctx.beginPath();
ctx.arc(200, 200, 50, Math.PI, 0, false);
ctx.fill();
ctx.fillStyle = "#76C76C";
ctx.fillRect(190, 180, 20, 140);
ctx.beginPath();
ctx.arc(200, 180, 10, Math.PI, 0, false);
ctx.fill();
```

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```
        ctx.strokeStyle = "#333";
        ctx.lineWidth = 2;
        let spikeLength = 8;
        for (let y = 210; y <= 310; y += 15) {
          ctx.beginPath();
          ctx.moveTo(145, y);
          ctx.lineTo(145 - spikeLength, y);
          ctx.stroke();

          ctx.beginPath();
          ctx.moveTo(255, y);
          ctx.lineTo(255 + spikeLength, y);
          ctx.stroke();
        }
        for (let angle = Math.PI; angle <= 0; angle += Math.PI / 10){
          let x = 200 + 50 * Math.cos(angle);
          let y = 200 + 50 * Math.sin(angle);
          let dx = Math.cos(angle - Math.PI / 2) * spikeLength;
          let dy = Math.sin(angle - Math.PI / 2) * spikeLength;
          ctx.beginPath();
          ctx.moveTo(x, y);
          ctx.lineTo(x + dx, y + dy);
          ctx.stroke();
        }
    </script>
</body>
</html>
```

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**OUTPUT:**


**Problem 3**

Write a JavaScript code to validate the register number based on their degree, year of joining and course

E.g. : 22BCE0000- Invalid, 23BCE0001 – Valid

**CODE:**

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```
<!DOCTYPE html>
<html lang="en">
<head>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial-
scale=1.0">
<title>Register Number Validator</title>
<style>
body {
font-family: Arial, sans-serif;
margin: 50px;
}
.container {
max-width: 400px;
margin: 0 auto;
padding: 20px;
border: 1px solid #ccc;
border-radius: 10px;
background-color: #f9f9f9;
}
h1 {
text-align: center;
color: #333;
}
label {
display: block;
margin: 10px 0 5px;
font-weight: bold;
}
input, select {
width: 100%;
padding: 10px;
margin-bottom: 15px;

border: 1px solid #ccc;
border-radius: 5px;
box-sizing: border-box;
}
button {
width: 100%;
padding: 10px;
background-color: #007bff;
color: white;
border: none;
border-radius: 5px;
cursor: pointer;
margin-top: 10px;
}
button:hover {
background-color: #0056b3;
}
.result {
margin-top: 20px;
padding: 10px;
border-radius: 5px;
text-align: center;
}
.valid {
background-color: #d4edda;
color: #155724;
}
.invalid {
background-color: #f8d7da;
color: #721c24;
}
</style>
</head>
<body>
<div class="container">
```

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```
<h1>Register Number Validator</h1>

<label for="regNumber">Enter Register Number (e.g.,
23BCE2021):</label>
<input type="text" id="regNumber" placeholder="e.g.,
23BCE2021" maxlength="9">

<label for="year">Enter Joining Year (e.g., 2023):</label>
<input type="number" id="year" placeholder="e.g., 2023"
min="2000" max="2099">

<label for="degree">Select Degree:</label>
<select id="degree">
<option value="">--Select Degree--</option>
<option value="BTech">BTech</option>
<option value="MTech">MTech</option>
</select>

<label for="course">Select Course:</label>
<select id="course">
<option value="">--Select Course--</option>
<option value="CS">Computer Science</option>
<option value="AIML">AI & ML</option>
</select>

<label for="rollNumber">Enter 4-digit Roll Number:</label>
<input type="text" id="rollNumber" placeholder="e.g., 2021"
maxlength="4">

<button onclick="validateRegisterNumber()">Validate Register
Number</button>

<div id="result" class="result"></div>
</div>
```

```
let expectedCourseCode = '';
if (degree === 'BTech' && course === 'CS') {
expectedCourseCode = 'BCE';
} else if (degree === 'MTech' && course === 'AIML') {
expectedCourseCode = 'BAI';
} else {
resultDiv.textContent = "Invalid course selection for the chosen
degree.";
resultDiv.className = 'result invalid';
return;
}
if (coursePart !== expectedCourseCode) {
resultDiv.textContent = `Course code mismatch! Expected: $
{expectedCourseCode}`;
resultDiv.className = 'result invalid';
return;
}
if (numberPart !== rollNumber) {
resultDiv.textContent = "Roll number mismatch!";
resultDiv.className = 'result invalid';
return;
}
resultDiv.textContent = "Valid register number!";
resultDiv.className = 'result valid';
}
</script>
</body>
</html>
```

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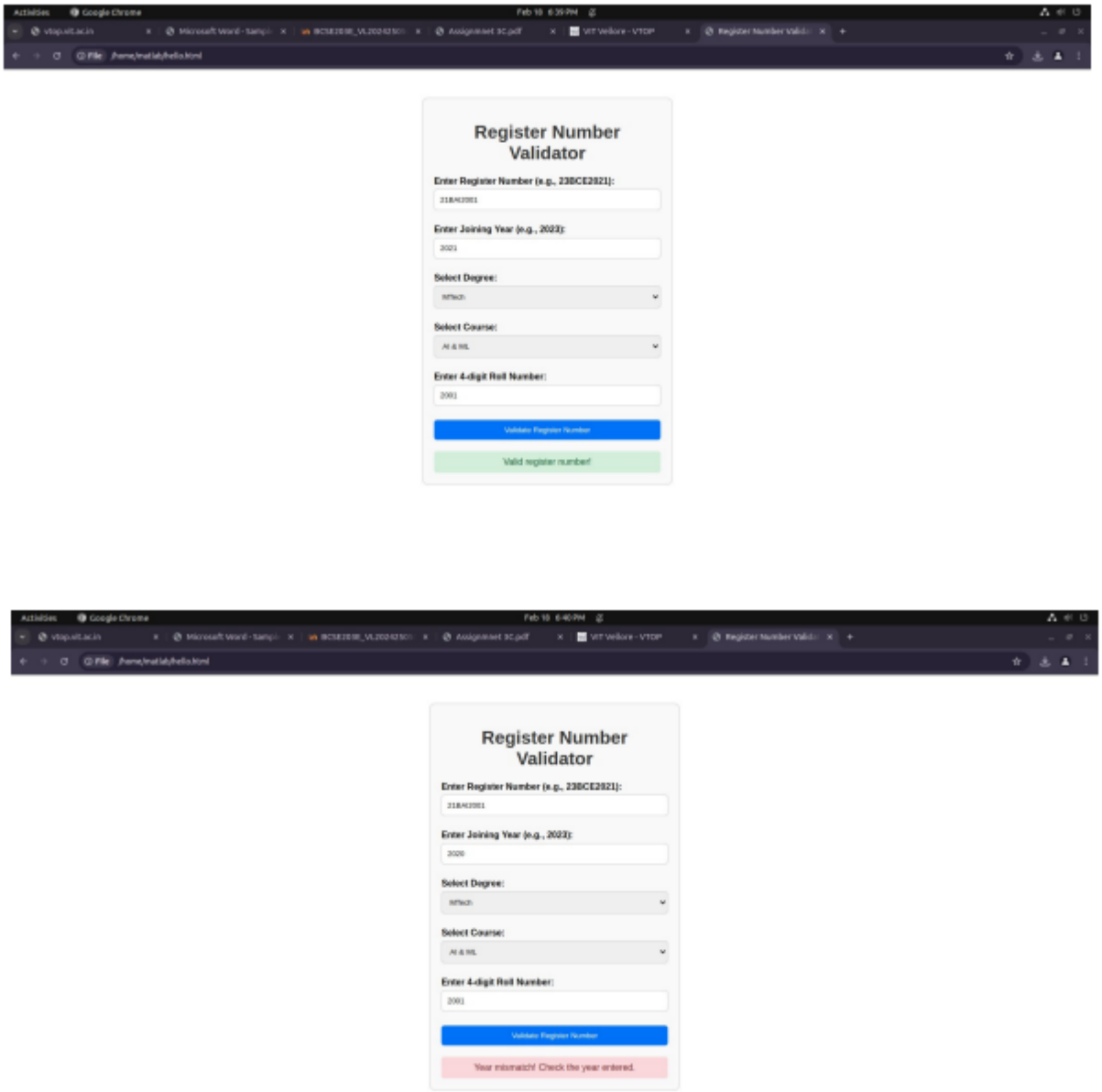
**OUTPUT:**



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## Problem 4

Design a web page to represent the emotions of a person using canvas and event handlers


**CODE:**

```
<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <title>Emotion Representation</title>
   <style>
      body {
         text-align: center;
         font-family: Arial, sans-serif;
      }
   </style>
</head>
<body>
   <h2>Basic Emotions</h2>
   <canvas id="emotionCanvas" width="500" height="300"></canvas>
   <p id="emotionText"></p>

   <script>
      const canvas = document.getElementById("emotionCanvas");
      const ctx = canvas.getContext("2d");
```

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```
const emotions = [
    { name: "Joy", color: "#FFD700", x: 80, y: 80 },
    { name: "Trust", color: "#90EE90", x: 200, y: 80 },
    { name: "Fear", color: "#5F9EA0", x: 320, y: 80 },
    { name: "Surprise", color: "#87CEEB", x: 440, y: 80 },
    { name: "Sadness", color: "#4682B4", x: 80, y: 200 },
    { name: "Disgust", color: "#9370DB", x: 200, y: 200 },
    { name: "Anger", color: "#FF6347", x: 320, y: 200 },
    { name: "Anticipation", color: "#FFA500", x: 440, y: 200 }
];

function drawEmotions() {
    ctx.clearRect(0, 0, canvas.width, canvas.height);
    emotions.forEach(emotion => {
        ctx.beginPath();
        ctx.arc(emotion.x, emotion.y, 40, 0, Math.PI * 2);
        ctx.fillStyle = emotion.color;
        ctx.fill();
        ctx.closePath();
    });
}

canvas.addEventListener("click", function(event) {
    const rect = canvas.getBoundingClientRect();
    const clickX = event.clientX - rect.left;
    const clickY = event.clientY - rect.top;

    emotions.forEach(emotion => {
        const distance = Math.sqrt((clickX - emotion.x) ** 2 + (clickY - emotion.y) ** 2);
        if (distance < 40) {
```

```
            document.getElementById("emotionText").innerText = "Selected Emotion: " +
emotion.name;
        }
      });
    });

    drawEmotions();
  </script>
</body>
</html>
```

**OUTPUT:**