F28WP Web Programming
Lab report
Lab 2

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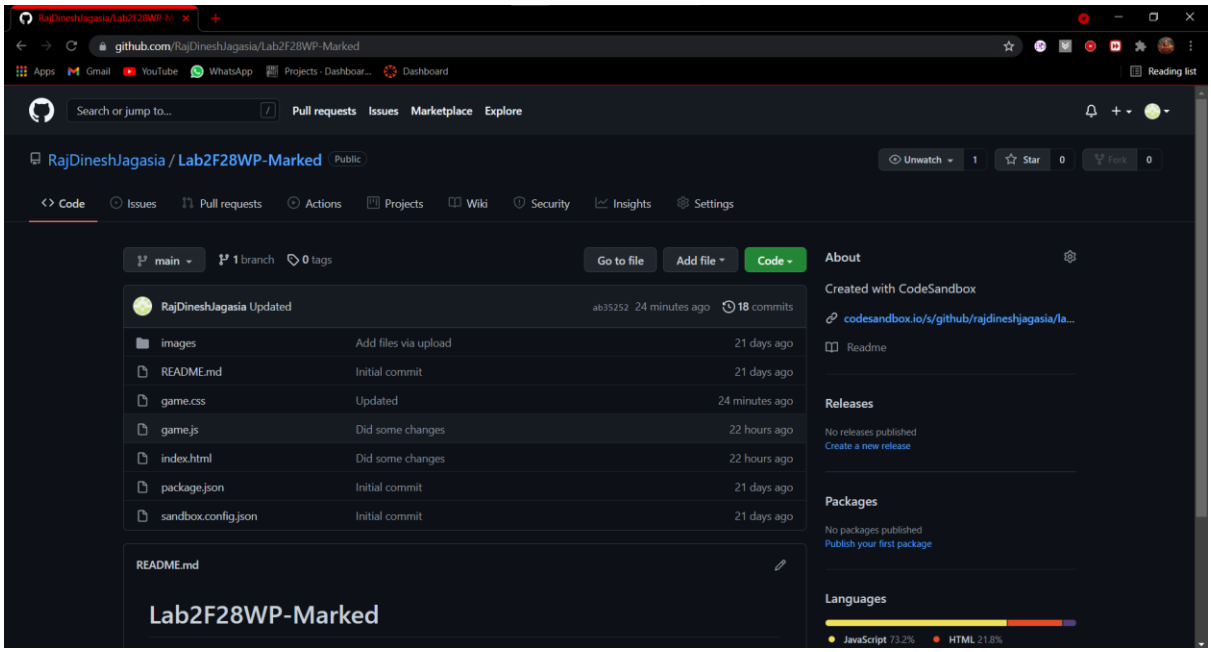
Student's GitHub URL of the Lab: https://github.com/RajDineshJagasia/Lab2F28WP-Marked

Demonstrated to Lab helper: Vicky Karkera

Mode of demonstration: Face to Face

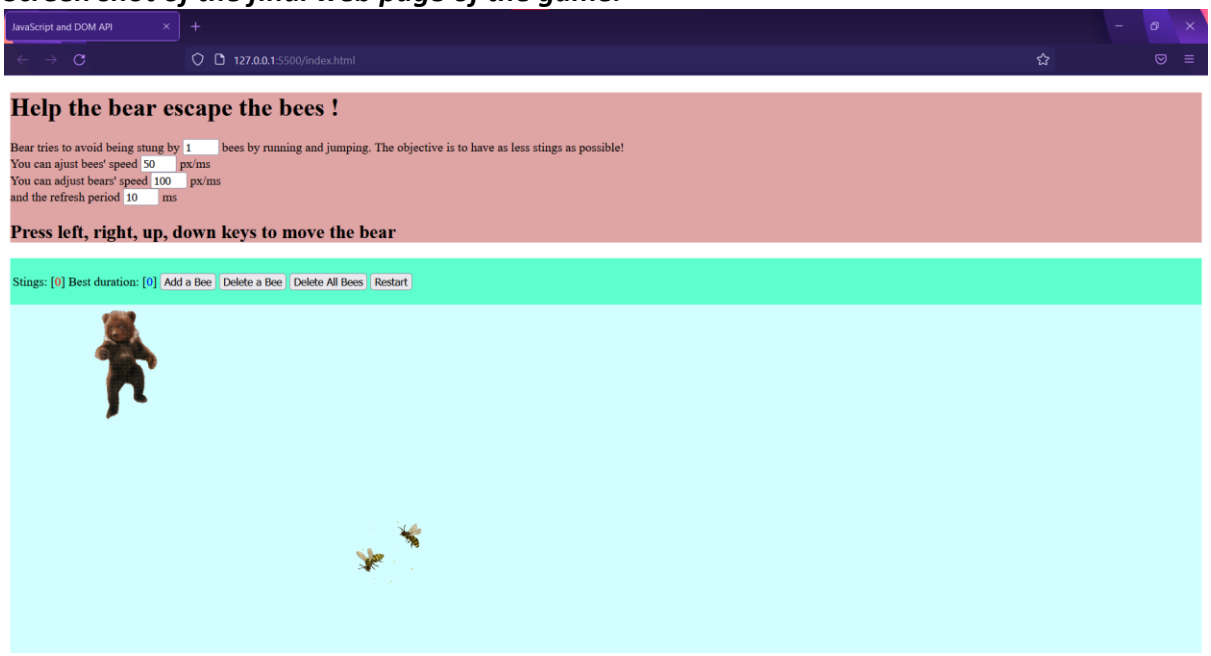
Date of demonstration: 2nd Nov 2021

Time of demonstration: 10:30 AM



Part 1: HTML/CSS

Screen shot of the final web page of the game.



CSS→Changed Colour of the div, Changed Board Size.

HTML→Added an input type text box (Bear speed) and 4 buttons, Global variables in script. (Also onchange,onload and onclick(Inline javascript))

Part 2: Bear motion

Explain how you implemented the speed input functionality.

I made a input box in HTML (to get the value from the user) and a new function 'setSpeed()' which reads the value the user entered in the text box. (With the help of DOM API)
And then we assign this value to dBear within bear.

```
function setSpeed(){
  bear.dBear=document.getElementById('speedBear').value
}
```

Compare bear speed with bee speed. What is the difference in the implementation?

In bear speed we just update the pixel values to dBear (given by the user). But in bee speed we use getRandomInt(max) function with max value as (2*speed) and we display bees at a random location. The Bear will be controlled by the user and the speed will move at random locations at a speed given by the user which creates the motion of the bees.

Part 3: Bee creation

Explain the use of DOM API to create <IMG> tag and add it to the game board.

I didn't create the bees IMG in index.html like the bear instead, created it using DOM API within the javascript file (game.js). I started with creating the element using

```
let img = document.createElement("img");
```

Then Set the Attributes using

```
img.setAttribute("src", "images/bee.gif");
```

I set the class of the img to Bee. After that I appended img to the DOM as a child of board div.
Then I used random coordinates to get random x and y coordinate values and set those values where I want my bee img to appear. At last, I returned the image

Explain the random coordinate generation.

I wrote a function getRandomInt(max) that generates and returns a random integer between 0 and max.
In this the max parameter is board dimension (this is so that that bee remains within the board and doesn't go outside)

```
function getRandomInt(max){
  let randomSpeed=Math.floor(Math.random() * max) ;
  return randomSpeed;
}
```

I used Math object provided by JavaScript

Part 4: Bee animation

Explain the use of timer to periodically refresh the bee positions.

I used DOM API to get the value the user gave in the text box and made it the refresh period. It is initially set to 10ms.
This means that the location of the image of the bee is updated every 10 ms.
I refresh the bee positions periodically to create a sense of motion in the bees so that the bees appear to be moving continuously.

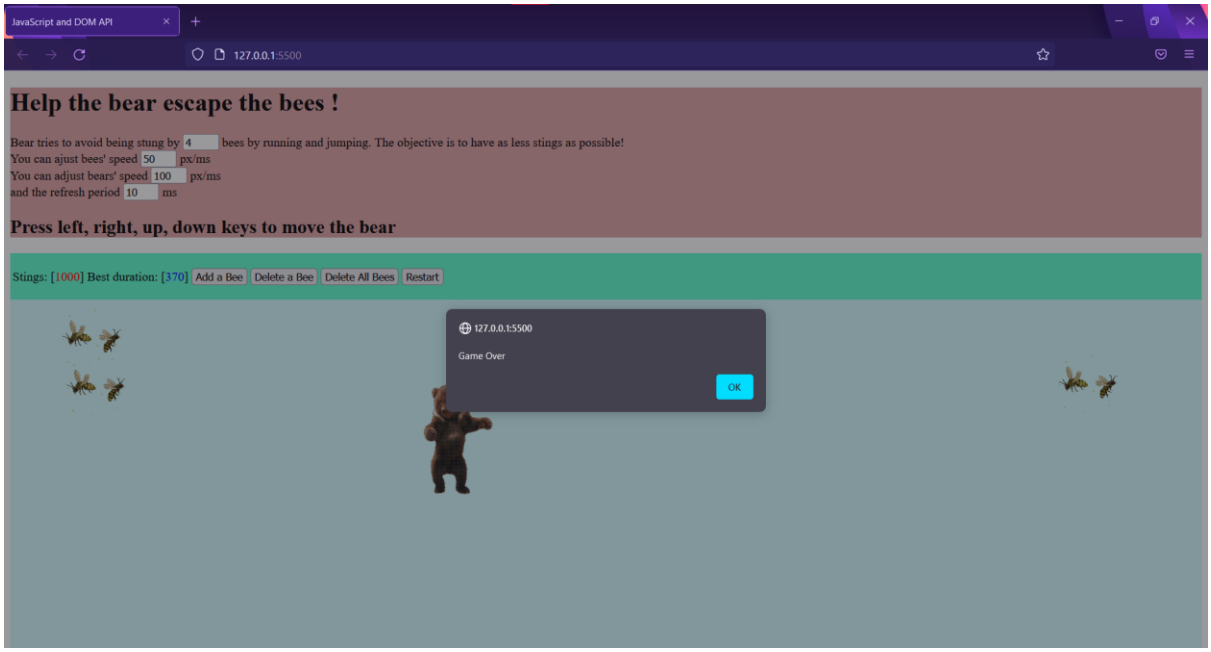
Part 5: Scores

Explain the method used to detect a sting and counting stings

I first used overlap() function to check whether my bear and bees are intersecting. If they don't intersect then intersectarea = 0 so it returns false. If they do intersect then we return true. We call overlap() in isHit() function if overlap() is false it doesn't do anything, but if it is true, each time the bear and bees intersect the number of hits(or stings) is incremented by 1. Then we call isHit() in moveBees() function. This is where the actual counting of the Bees take place.

Explain your implementation of the game over feature and insert a screen shot

```
function updateBees() {
  moveBees();
  let period = document.getElementById("periodTimer").value;
  if (hits.innerHTML>=1000){
    alert("Game Over");
    clearTimeout();}
  else{
    updateTimer = setTimeout('updateBees()', period); }
```



In Game Over I used an 'if statement' which checks if the number of hits is greater than or equal to 1000 (hits.innerHTML >= 1000), if it is then it gives an alert("Game Over") and clears the clears the timeout using clearTimeout(). I did this within updateBees() function.

Part 6: Best duration

Explain your implementation of calculating the longest period without stings.

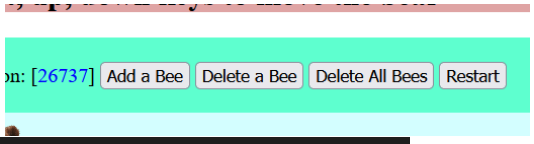
This is done within isHit() function.
The longest period without stings is calculated by finding the difference between the new Sting and the previous Sting.
If longestduration is 0 then the longest duration is the thisduration.
If it is not 0 it will compare longestduration and thisduration as to which is greater. If thisduration is greater then longestduration will be equal to thisduration. If not longestduration will not change.

```
function isHit(defender, offender) {
 if (overlap(defender, offender)) { //check if the two image overlap
 let score = hits.innerHTML;
 score = Number(score) + 1; //increment the score
 hits.innerHTML = score; //display the new score
 let newStingTime = new Date();
 let thisDuration = newStingTime - lastStingTime;
 lastStingTime = newStingTime;
 let longestDuration = Number(duration.innerHTML);
 if (longestDuration === 0||isNaN(longestDuration)) {
 longestDuration = thisDuration;
 } else {
 if (longestDuration < thisDuration) longestDuration = thisDuration;
 }
 document.getElementById("duration").innerHTML = longestDuration;

 }
}
```

Part 7: Additional features

I have implemented 4 additional features.
I made the in index.html under div scores.




```
</td>
<td>
    <p><input type ='button' value='Add a Bee' id="addBee" onclick="addBee()"></p>
</td>
<td>
    <p><input type ='button' value='Delete a Bee' id="delBee" onclick="delBee()"></p>
</td>
<td>
    <p><input type ='button' value='Delete All Bees' id="delAllBees" onclick="delAllBees()"></p>
</td>
<td>
    <p><input type ='button' value='Restart' id="res" onclick="restart()"></p>
</td>
```

Add a Bee

I took the value of the current bees on the board then incremented the value by 1. After than pushed the bee on the board.

```
function addBee(){
 let nbBees = document.getElementById("nbBees").value ;
 let numBees = Number(nbBees);
 document.getElementById("nbBees").value=numBees+1;
```

Delete a Bee

I took the value of the current bees on the board then checked if it is 0 or not. If it is 0 it will prompt an alert message. If it is not 0 then decremented the value by 1. After that removed a Bee from the board.

```
function delBee(){
 let nbBees = document.getElementById("nbBees").value ;
 let numBees = Number(nbBees);
 if (numBees==0){
   window.alert("There are already 0 bees");
   return;
 }
 document.getElementById("nbBees").value=numBees-1;
```

Delete All Bees

I took the value of the current bees on the board then checked if it is 0 or not. If it is 0 it will prompt an alert message. If it is not 0 then set the value to 0. After that there are no Bees on the board.

```
function delAllBees(){
 let nbBees = document.getElementById("nbBees").value ;
 let numBees = Number(nbBees);
 if (numBees==0){
   window.alert("There are already 0 bees");
   return;
 }
 document.getElementById("nbBees").value=numBees=0;
```

Restart

In this I cleared my hits, duration and my bee's array. After that I used location.reload() to restart the game.

```
function restart(){
  hits.innerHTML=0;
  duration.innerHTML=0;
  bees=[];
  location.reload();
}
```

The End