

Background

In this Project you will recreate the popular Yahtzee dice game for one player to run on a web browser. Refer to the “Sample game” at the end to guide your work and please customise it to your own preferences. The rules for the game should be implemented closely as per those in the public domain [1]:

[1] Milton Bradley Company, "Yahtzee Instructions - 1 or More Players", <http://www.hasbro.com/common/instruct/yahtzee.pdf>, PDF download, 1996, retrieved 11/2/2019.

Tasks 1: Objectives report

You have some freedom in how you design the interface for the game. However, a critical aspect of this Project will be to prepare a **report** showing how parts of your solution map to the certification exam objectives. Marks for Tasks 1-6 are tied to completing the report and code together as a pair. You will not earn marks for Tasks 1-6 if you do the report without the code or vice versa.

An example report and a template have been provided. You may try the technical tasks suggested in the example as written, modify them, or choose alternatives from the certification exam objectives.

Marks are awarded for the following certification objectives and they must have **two examples** each:

- A.1: Create the document structure by using HTML
- A.3: Apply styling to HTML elements programmatically
- A.5: Establish the scope of objects and variables
- A.6: Create and implement objects and methods
- B.1: Implement program flow
- B.2: Raise and handle an event
- D.1: Style HTML text properties
- D.2: Style HTML box properties
- D.3: Create a flexible content layout
- D.4: Create an animated and adaptive UI
- D.5: Find elements by using CSS selectors and jQuery
- D.6: Structure a CSS file by using CSS selectors

These objectives report must be completed with this table included.

Objective	Example	Location	Description (1-2 sentences)
A.1: Create the document structure by using HTML	1	filename:lineno	Element: description
	2		
A.3: Apply styling to HTML elements programmatically	1		
	2		
A.5: Establish the scope of objects and variables	1		
	2		
A.6: Create and implement objects and methods	1		
	2		

B.1: Implement program flow	1		
	2		
B.2: Raise and handle an event	1		
	2		
D.1: Style HTML text properties	1		
	2		
D.2: Style HTML box properties	1		
	2		
D.3: Create a flexible content layout	1		
	2		
D.4: Create an animated and adaptive UI	1		
	2		
D.5: Find elements by using CSS selectors and jQuery	1		
	2		
D.6: Structure a CSS file by using CSS selectors	1		
	2		

Task 2: Game content (yahtzee.html)

Marks are awarded for your HTML for the content put into your game. This includes text, images, controls and the containers that hold them all. You should aim to create a well-organised page.

Task 3: Game presentation (yahtzee.css)

Marks are awarded for your CSS for the presentation of the game. This includes styling of the content and the layout. You should aim to create an attractive design.

Task 4: Game logic (yahtzee.js)

Marks are awarded for your JavaScript/jQuery for the logic of the game. This includes logic based on sequence, selection and repetition structures, plus core concepts such as variables, functions, arrays, and event handling. You should aim to create a very functional game.

Task 5: Coding conventions

This task will award marks according to the quality of your code according to these aspects:

1. HTML, CSS and JavaScript indentation is consistent with one level of indentation per block.
2. The HTML, CSS and JavaScript files each use some comments (<!--comment -->, /* comment */ or // comment as appropriate, minimum of 3 per file).

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3. The W3C HTML markup validation service (<https://validator.w3.org>) reports zero errors and zero warnings on the code when tested with the “validate by direct input” method.
4. The W3C CSS markup validation service (<https://jigsaw.w3.org/css-validator>) reports zero errors and zero warnings on the code when tested with the “validate by direct input” method.
5. The page footer includes hyperlinks to the W3C HTML and CSS markup validation services to indicate compliance to the W3C standards.

Extra: Although marks are not allocated, it is also good practice for HTML, CSS and JavaScript code to consistently use best-practice casing (lowercase for HTML/CSS and [camelCase](#) for JavaScript). (The DOCTYPE declaration is an exception.)

Task 6: Organisation

The following organisational aspects must be put in place for your solution:

(a) Programming language:

The web page will be a DHTML web page. DHTML refers to Dynamic HTML. DHTML is the combination of HTML5, CSS3 and JavaScript working together to create a web page that has a dynamic feel. Note that JavaScript may also include jQuery and is strongly encouraged.

(b) Third-party components:

A critical aspect of this Project is to develop the coding skills by hand. Therefore, except for jQuery, third-party libraries are not permitted for this Project (Bootstrap, etc.).

(c) Images:

Store the images in a subfolder called “images”. Note that the web page cannot use copyrighted images. To avoid this problem, you are welcome to use images with an open licence. You can get these from [free image websites](#) or by performing an image search on your search engine with a “usage rights” filter set to “labelled for reuse” (or equivalent). Maintain a list of references in a file called references.txt in your solution with the name, author, location and access date of the images.

(d) Integrated development environment:

The website must be built using Visual Studio 2017.

(e) Template:

The website will be built from scratch beginning with an empty folder. Follow these steps:

- a) Create a new folder called **xxx_cse2wdx_Project2**, where xxx is your student ID.
- b) Open Visual Studio 2017. Select “File” -> “Open” -> “Website...” and select the new folder.
- c) Select “File” -> “Close Solution” immediately. This will prompt you to save a solution file (*.sln suffix). This must be saved in your new folder. Close Visual Studio 2017.
- d) Double-click on the solution file to open Visual Studio 2017 and your solution again. Continue to use this method for opening your solution going forward for convenience.
- e) You are now ready to go. Add your project assets next.

Sample game

1. New game

The beginning of the game may look like the following with placeholders for the dice and a scoreboard:

Yahtzee

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Roll the dice!
3 roll(s) remaining.

Category	Description	How to score	Points	Submit
Aces	Any combination	Sum of dice with "1"	0	Submit
Twos	Any combination	Sum of dice with "2"	0	Submit
Threes	Any combination	Sum of dice with "3"	0	Submit
Fours	Any combination	Sum of dice with "4"	0	Submit
Fives	Any combination	Sum of dice with "5"	0	Submit
Sixes	Any combination	Sum of dice with "6"	0	Submit
Subtotal	Upper subtotal	Sum of six rows above	0	
Bonus	Awarded if subtotal is 63 or more	Score 35	0	
Upper total			0	

Category	Description	How to score	Points	Submit
Three of a kind	Minimum of three dice the same	Sum of all dice	0	Submit
Four of a kind	Minimum of four dice the same	Sum of all dice	0	Submit
Full house	Three of one number and two of another	Score 25	0	Submit
Small straight	Four dice in sequence	Score 30	0	Submit
Large straight	Five dice in sequence	Score 40	0	Submit
Yahtzee	All dice the same	Score 50	0	Submit
Chance	Any combination	Sum of all dice	0	Submit
Yahtzee bonus	Additional Yahtzees	Score 100 each	0	
Lower total			0	

Your total score: 0

Restart game

Read the Yahtzee rules [here](#). Valid [HTML5](#) and [CSS3](#).

2. First dice roll

After clicking "Roll the dice!" you get to see the dice for the first time:

Yahtzee

Roll the dice!
2 roll(s) remaining.
Click on a die to prevent rerolling. Click again to undo.

Category	Description	How to score	Points	Submit
Aces	Any combination	Sum of dice with "1"	0	Submit
Twos	Any combination	Sum of dice with "2"	0	Submit
Threes	Any combination	Sum of dice with "3"	0	Submit
Fours	Any combination	Sum of dice with "4"	0	Submit
Fives	Any combination	Sum of dice with "5"	0	Submit
Sixes	Any combination	Sum of dice with "6"	0	Submit
Subtotal	Upper subtotal	Sum of six rows above	0	
Bonus	Awarded if subtotal is 63 or more	Score 35	0	
Upper total			0	

Category	Description	How to score	Points	Submit
Three of a kind	Minimum of three dice the same	Sum of all dice	0	Submit
Four of a kind	Minimum of four dice the same	Sum of all dice	0	Submit
Full house	Three of one number and two of another	Score 25	0	Submit
Small straight	Four dice in sequence	Score 30	0	Submit
Large straight	Five dice in sequence	Score 40	0	Submit
Yahtzee	All dice the same	Score 50	0	Submit
Chance	Any combination	Sum of all dice	0	Submit
Yahtzee bonus	Additional Yahtzees	Score 100 each	0	
Lower total			0	

Your total score: 0

Restart game

Read the Yahtzee rules [here](#). Valid [HTML5](#) and [CSS3](#).

3. Evaluating the dice (first time)

You then decide that you want to try to make a good score with the “3” dice, so you click on them to select and highlight them:

Roll the dice!
2 roll(s) remaining.
Click on a die to prevent rerolling. Click again to undo.

Category	Description	How to score	Points	Submit
Aces	Any combination	Sum of dice with "1"	0	<input type="button" value="Submit"/>
Twos	Any combination	Sum of dice with "2"	0	<input type="button" value="Submit"/>
Threes	Any combination	Sum of dice with "3"	0	<input type="button" value="Submit"/>
Fours	Any combination	Sum of dice with "4"	0	<input type="button" value="Submit"/>
Fives	Any combination	Sum of dice with "5"	0	<input type="button" value="Submit"/>
Sixes	Any combination	Sum of dice with "6"	0	<input type="button" value="Submit"/>
Subtotal	Upper subtotal	Sum of six rows above	0	
Bonus	Awarded if subtotal is 63 or more	Score 35	0	
Upper total			0	

Category	Description	How to score	Points	Submit
Three of a kind	Minimum of three dice the same	Sum of all dice	0	<input type="button" value="Submit"/>
Four of a kind	Minimum of four dice the same	Sum of all dice	0	<input type="button" value="Submit"/>
Full house	Three of one number and two of another	Score 25	0	<input type="button" value="Submit"/>
Small straight	Four dice in sequence	Score 30	0	<input type="button" value="Submit"/>
Large straight	Five dice in sequence	Score 40	0	<input type="button" value="Submit"/>
Yahtzee	All dice the same	Score 50	0	<input type="button" value="Submit"/>
Chance	Any combination	Sum of all dice	0	<input type="button" value="Submit"/>
Yahtzee bonus	Additional Yahtzees	Score 100 each	0	
Lower total			0	

Your total score: 0

Read the Yahtzee rules [here](#). Valid [HTML5](#) and [CSS3](#).

4. Second dice roll

After rolling the dice the second time, the 3rd, 4th and 5th dice are now new and are shown here:

Roll the dice!
1 roll(s) remaining.
Click on a die to prevent rerolling. Click again to undo.

Category	Description	How to score	Points	Submit
Aces	Any combination	Sum of dice with "1"	0	<input type="button" value="Submit"/>
Twos	Any combination	Sum of dice with "2"	0	<input type="button" value="Submit"/>
Threes	Any combination	Sum of dice with "3"	0	<input type="button" value="Submit"/>
Fours	Any combination	Sum of dice with "4"	0	<input type="button" value="Submit"/>
Fives	Any combination	Sum of dice with "5"	0	<input type="button" value="Submit"/>
Sixes	Any combination	Sum of dice with "6"	0	<input type="button" value="Submit"/>
Subtotal	Upper subtotal	Sum of six rows above	0	
Bonus	Awarded if subtotal is 63 or more	Score 35	0	
Upper total			0	

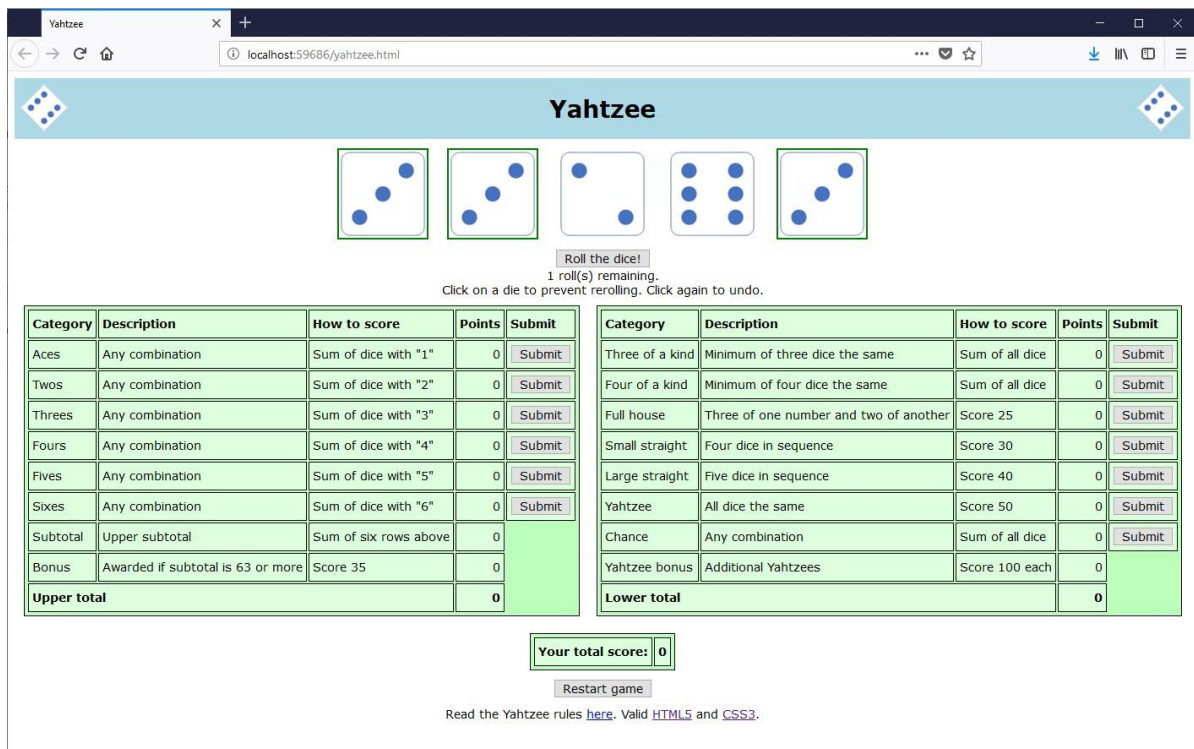
Category	Description	How to score	Points	Submit
Three of a kind	Minimum of three dice the same	Sum of all dice	0	<input type="button" value="Submit"/>
Four of a kind	Minimum of four dice the same	Sum of all dice	0	<input type="button" value="Submit"/>
Full house	Three of one number and two of another	Score 25	0	<input type="button" value="Submit"/>
Small straight	Four dice in sequence	Score 30	0	<input type="button" value="Submit"/>
Large straight	Five dice in sequence	Score 40	0	<input type="button" value="Submit"/>
Yahtzee	All dice the same	Score 50	0	<input type="button" value="Submit"/>
Chance	Any combination	Sum of all dice	0	<input type="button" value="Submit"/>
Yahtzee bonus	Additional Yahtzees	Score 100 each	0	
Lower total			0	

Your total score: 0

Read the Yahtzee rules [here](#). Valid [HTML5](#) and [CSS3](#).

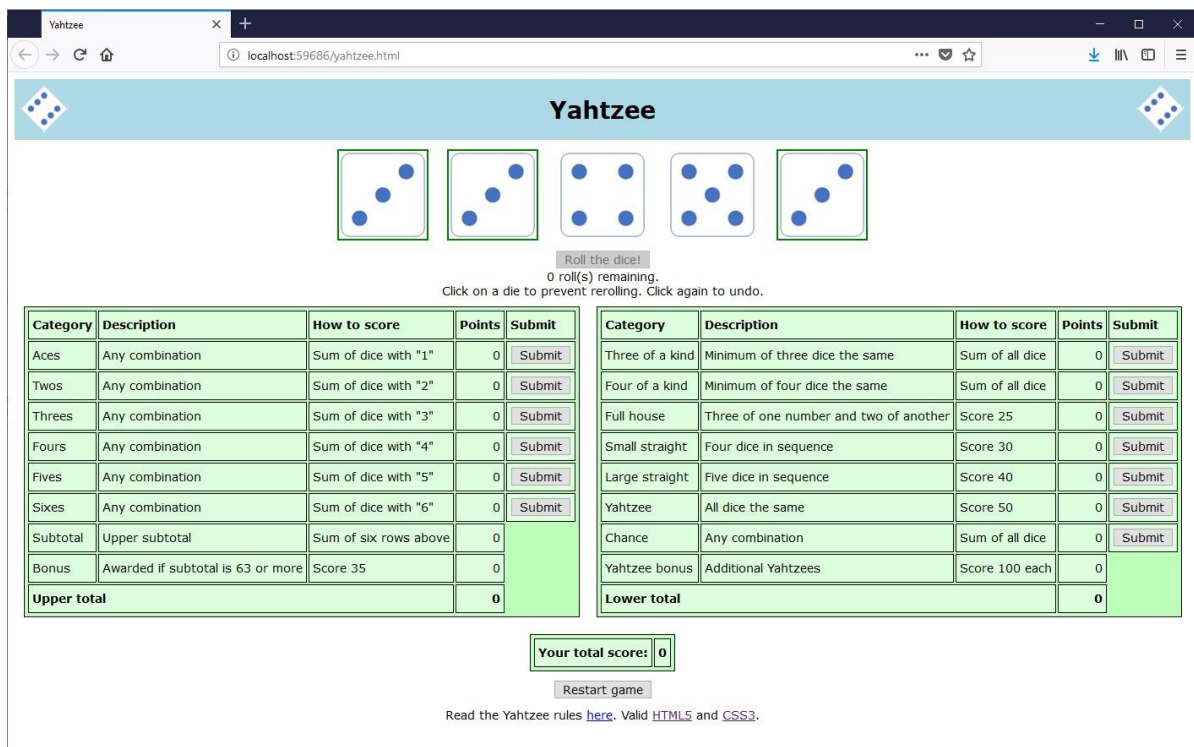
5. Evaluating the dice (second time)

You find that another dice shows a “3”, so you highlight it, with the aim to get more for the final roll:



6. Third dice roll

Unfortunately, you didn't get any more "3" dice.



7. Scoring

You click the “Submit” button associated with the “Threes” part of the scoreboard to claim 9 points. That option cannot be claimed again. You then continue the game and get ready to roll the dice again:

Yahtzee

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Roll the dice!
3 roll(s) remaining.

Category	Description	How to score	Points	Submit
Aces	Any combination	Sum of dice with "1"	0	Submit
Twos	Any combination	Sum of dice with "2"	0	Submit
Threes	Any combination	Sum of dice with "3"	9	Submit
Fours	Any combination	Sum of dice with "4"	0	Submit
Fives	Any combination	Sum of dice with "5"	0	Submit
Sixes	Any combination	Sum of dice with "6"	0	Submit
Subtotal	Upper subtotal	Sum of six rows above	9	
Bonus	Awarded if subtotal is 63 or more	Score 35	0	
Upper total			9	

Category	Description	How to score	Points	Submit
Three of a kind	Minimum of three dice the same	Sum of all dice	0	Submit
Four of a kind	Minimum of four dice the same	Sum of all dice	0	Submit
Full house	Three of one number and two of another	Score 25	0	Submit
Small straight	Four dice in sequence	Score 30	0	Submit
Large straight	Five dice in sequence	Score 40	0	Submit
Yahtzee	All dice the same	Score 50	0	Submit
Chance	Any combination	Sum of all dice	0	Submit
Yahtzee bonus	Additional Yahtzees	Score 100 each	0	
Lower total			0	

Your total score:

9

Restart game

Read the Yahtzee rules [here](#). Valid [HTML5](#) and [CSS3](#).

8. End of game

Here's an example of a finished game. Unfortunately, no Yahtzees were scored, but all other categories were achieved. Click "Restart game" to reset the board and go again!

Yahtzee

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Roll the dice!
3 roll(s) remaining.

Category	Description	How to score	Points	Submit
Aces	Any combination	Sum of dice with "1"	3	Submit
Twos	Any combination	Sum of dice with "2"	4	Submit
Threes	Any combination	Sum of dice with "3"	12	Submit
Fours	Any combination	Sum of dice with "4"	16	Submit
Fives	Any combination	Sum of dice with "5"	15	Submit
Sixes	Any combination	Sum of dice with "6"	18	Submit
Subtotal	Upper subtotal	Sum of six rows above	68	
Bonus	Awarded if subtotal is 63 or more	Score 35	35	
Upper total			103	

Category	Description	How to score	Points	Submit
Three of a kind	Minimum of three dice the same	Sum of all dice	25	Submit
Four of a kind	Minimum of four dice the same	Sum of all dice	24	Submit
Full house	Three of one number and two of another	Score 25	25	Submit
Small straight	Four dice in sequence	Score 30	30	Submit
Large straight	Five dice in sequence	Score 40	40	Submit
Yahtzee	All dice the same	Score 50	0	Submit
Chance	Any combination	Sum of all dice	20	Submit
Yahtzee bonus	Additional Yahtzees	Score 100 each	0	
Lower total			164	

Your total score:

267

Restart game

Read the Yahtzee rules [here](#). Valid [HTML5](#) and [CSS3](#).