Web Development Assignment Report

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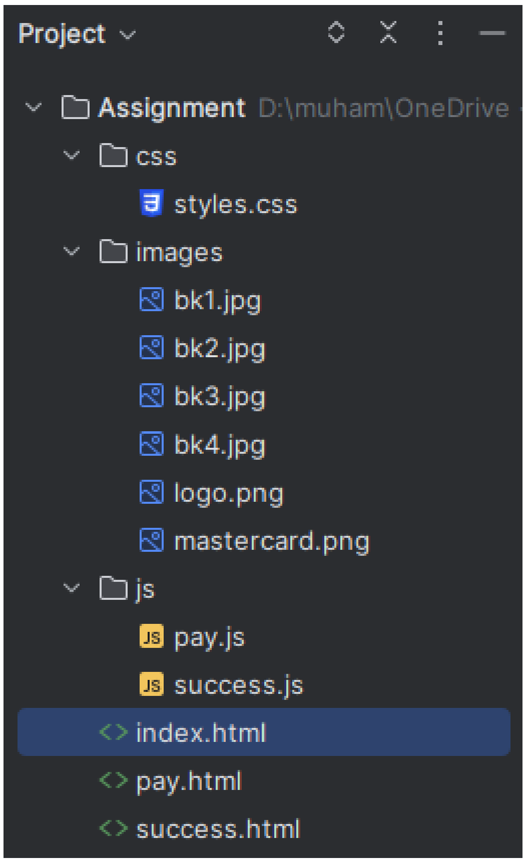
[22459321]

Contents

Section A: Directory Structure



```
Project
  Assignment D:\muham\OneDrive
    css
      styles.css
    images
      bk1.jpg
      bk2.jpg
      bk3.jpg
      bk4.jpg
      logo.png
      mastercard.png
    js
      pay.js
      success.js
    index.html
    pay.html
    success.html
```

The project is built in the structure shown above. In the root directory are the html files for the 3 required web pages as well as three further directories. The images assets, such as the site logo and book images are stored in the images folder, the js directory holds the Javascript files for the payment and success pages, and the css directory holds the stylesheet for the website.

```html
<link rel="stylesheet" href="css/styles.css">
<script src="js/pay.js"></script>
```

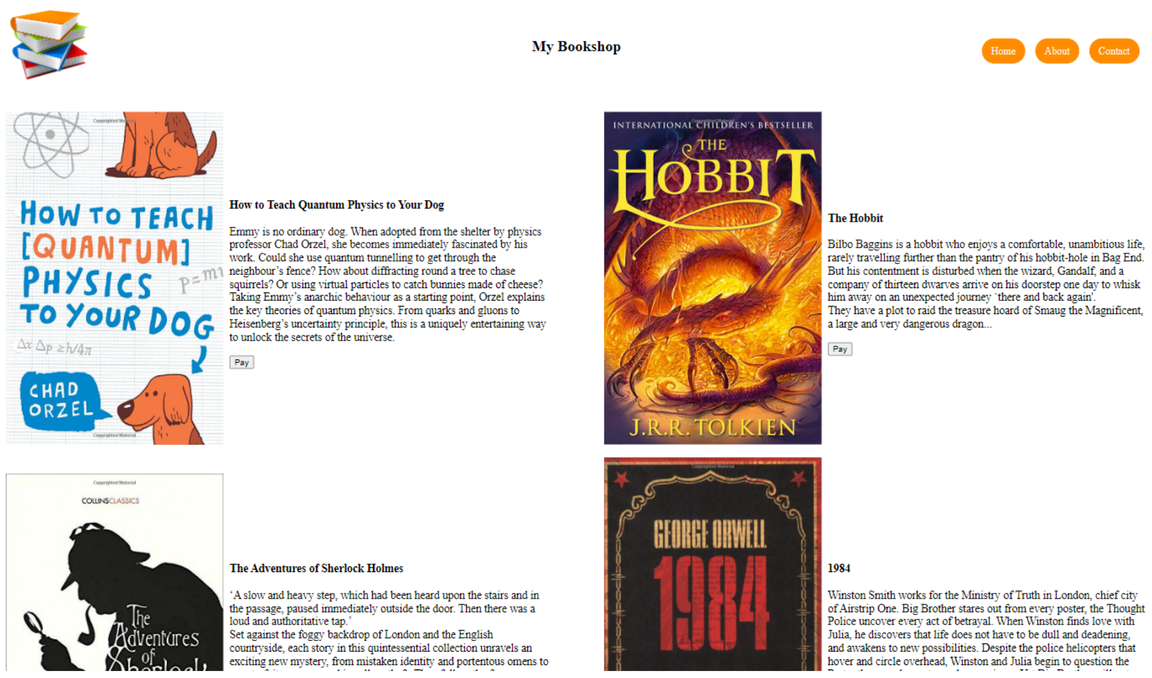
The CSS and Javascript files are linked to the corresponding html files using <link> and <script> tags respectively.

```html
<img class="book-img" src="images/bk1.jpg" alt="book 1">
```

The images are linked in the respective <img> tags using the src attribute.

Section B: Frontend

Desktop view of index.html and pay.html


My Bookshop

Home | About | Contact

How to Teach Quantum Physics to Your Dog

Emmy is no ordinary dog. When adopted from the shelter by physics professor Chad Orzel, she becomes immediately fascinated by his work. Could she use quantum tunnelling to get through the neighbour's fence? How about diffracting round a tree to chase squirrels? Or using virtual particles to catch bunnies made of cheese? Taking Emmy's anarchic behaviour as a starting point, Orzel explains the key theories of quantum physics. From quarks and gluons to Heisenberg's uncertainty principle, this is a uniquely entertaining way to unlock the secrets of the universe.

Pay

The Hobbit

Bilbo Baggins is a hobbit who enjoys a comfortable, unambitious life, rarely travelling further than the pantry of his hobbit-hole in Bag End. But his contentment is disturbed when the wizard, Gandalf, and a company of thirteen dwarves arrive on his doorstep one day to whisk him away on an unexpected journey `there and back again'.
They have a plot to raid the treasure hoard of Smaug the Magnificent, a large and very dangerous dragon...

Pay

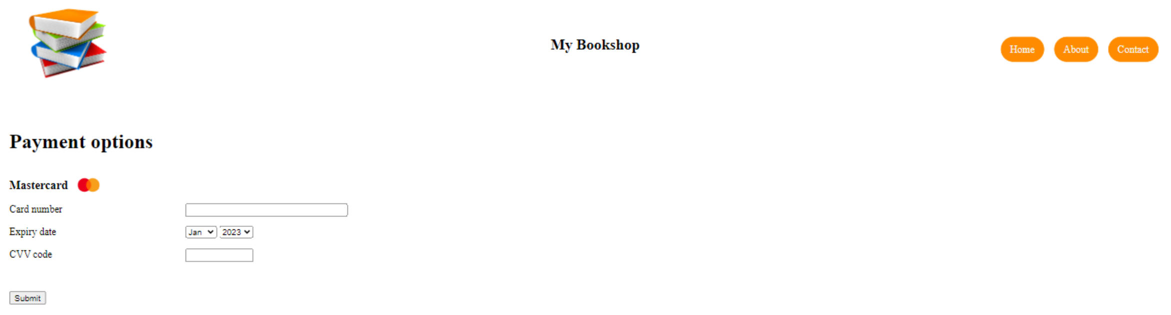
The Adventures of Sherlock Holmes

'A slow and heavy step, which had been heard upon the stairs and in the passage, paused immediately outside the door. Then there was a loud and authoritative tap.'
Set against the foggy backdrop of London and the English countryside, each story in this quintessential collection unravels an exciting new mystery, from mistaken identity and portentous omens to

1984

Winston Smith works for the Ministry of Truth in London, chief city of Airstrip One. Big Brother stares out from every poster, the Thought Police uncover every act of betrayal. When Winston finds love with Julia, he discovers that life does not have to be dull and deadening, and awakens to new possibilities. Despite the police helicopters that hover and circle overhead, Winston and Julia begin to question the

The web page adapts to the size of the screen and changes the view responsively. On a large screen such as a desktop, the books display in two columns which fill the screen horizontally. On a smaller screen, such as a mobile device, the flex will change direction to display the books in a single column and change the font size to better fit the available space. This is achieved using a media query to change the behaviour according to the width of the screen.
The navigation bar also collapses to a menu with a toggle to show the items when the screen is small. This prevents the navigation items from obstructing the main content or overlapping over elements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Payment options

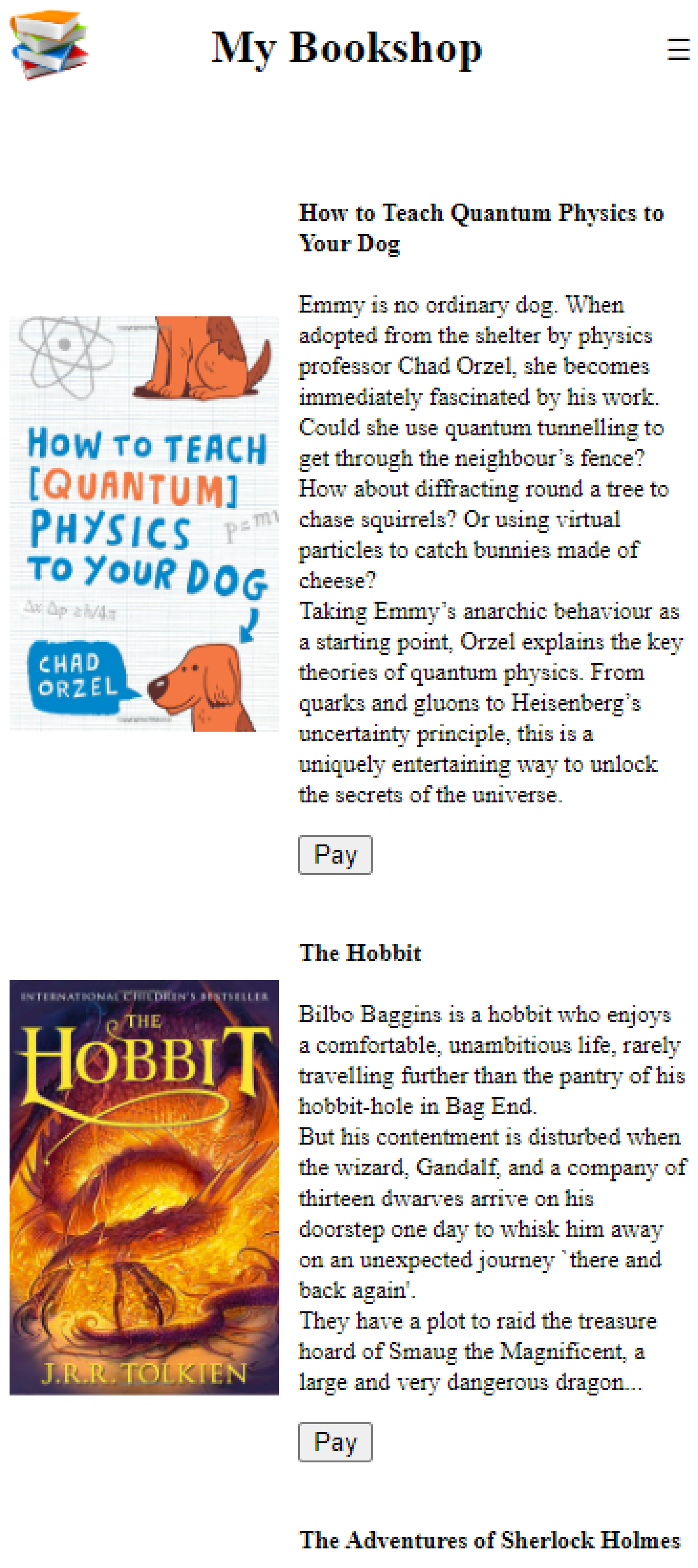
Mastercard

Card number	
Expiry date	Jan 2023
CVV code	

Submit

On the payment page, the form shows labels in line with input elements in desktop view, where there is more horizontal space, and shows the labels above each input on narrower mobile screens to prevent to avoid having overflowing text and labels.

Mobile view of index.html and pay.html



My Bookshop ☰

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Pay

The Adventures of Sherlock Holmes

HOW TO TEACH [QUANTUM] PHYSICS TO YOUR DOG
CHAD ORZEL
INTERNATIONAL CHILDREN'S BESTSELLER
THE HOBBIT
J.R.R. TOLKIEN

My Bookshop ☰

Payment options

Mastercard

Card number

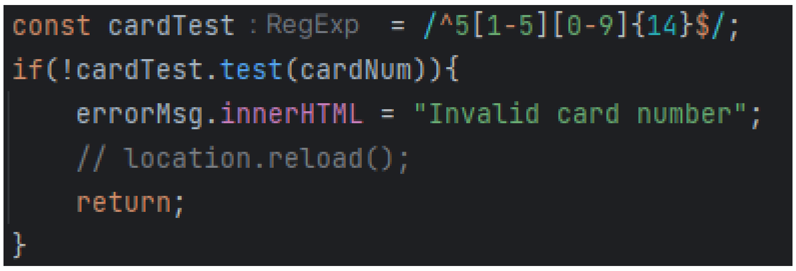
Expiry date

Jan 2023

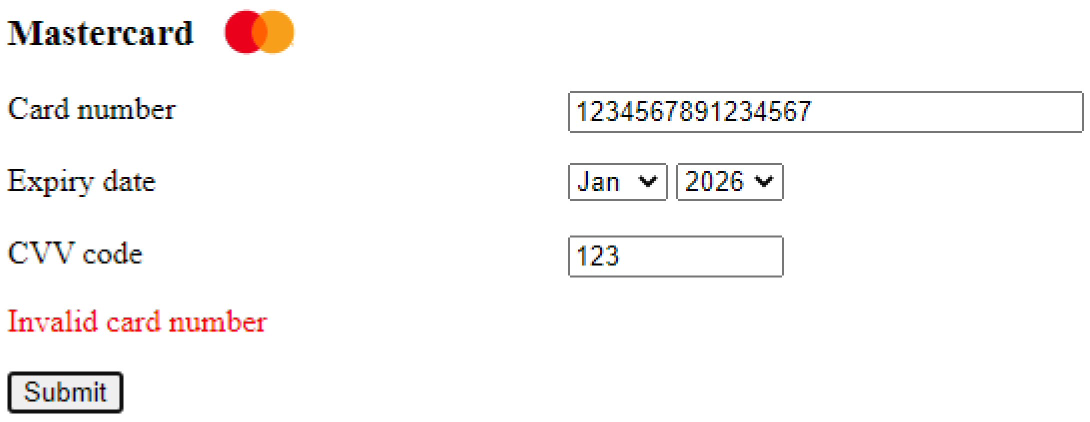
CVV code

Submit

Section C: RESTful



```
const cardTest : RegExp  = /^5[1-5][0-9]{14}$/;
if(!cardTest.test(cardNum)){
    errorMsg.innerHTML = "Invalid card number";
    // location.reload();
    return;
}
```

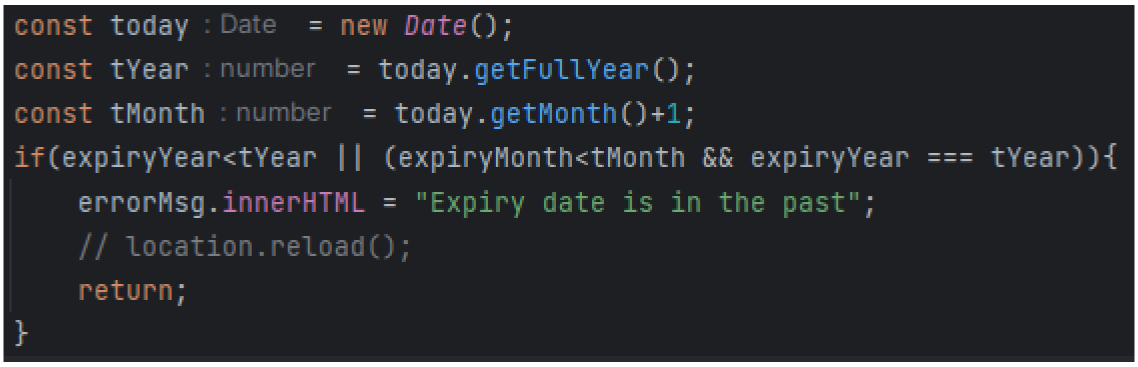


Mastercard

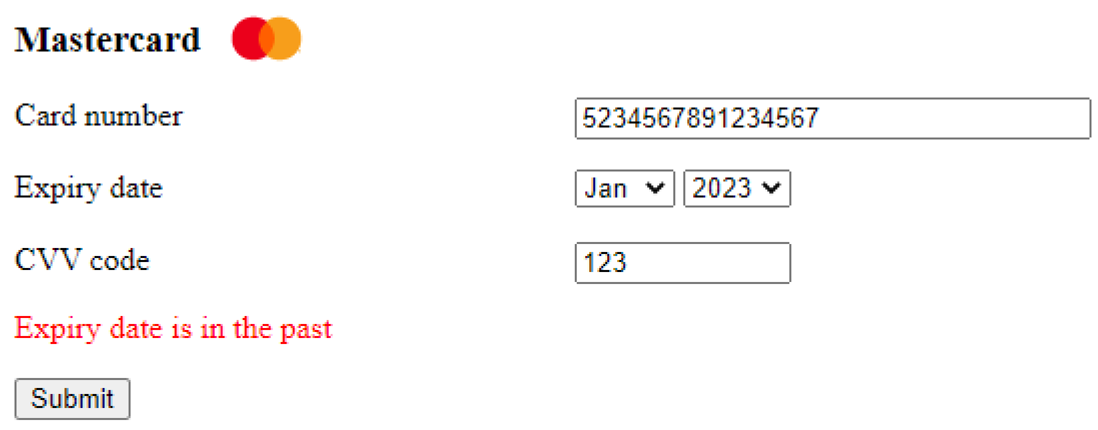
Card number	1234567891234567
Expiry date	Jan 2026
CVV code	123

Invalid card number

When the submit button is pressed on the payment page, the javascript event handler begins verification of the card details entered by the user. First, the card number is checked using a regular expression, which checks that it begins with 51-55, contains only digits 0-9, and is 16 digits long. If this fails, the error message text is updated to inform the user and the process does not continue.



```
const today : Date  = new Date();
const tYear : number  = today.getFullYear();
const tMonth : number  = today.getMonth()+1;
if(expiryYear<tYear || (expiryMonth<tMonth && expiryYear === tYear)){
    errorMsg.innerHTML = "Expiry date is in the past";
    // location.reload();
    return;
}
```

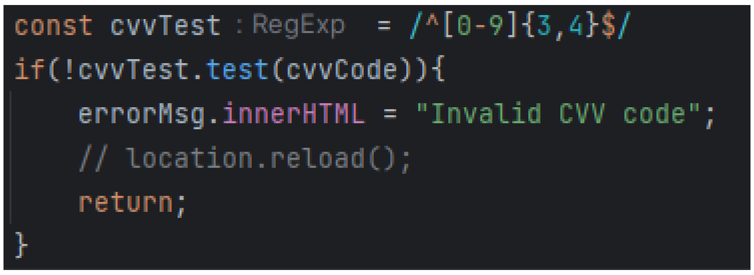


Mastercard

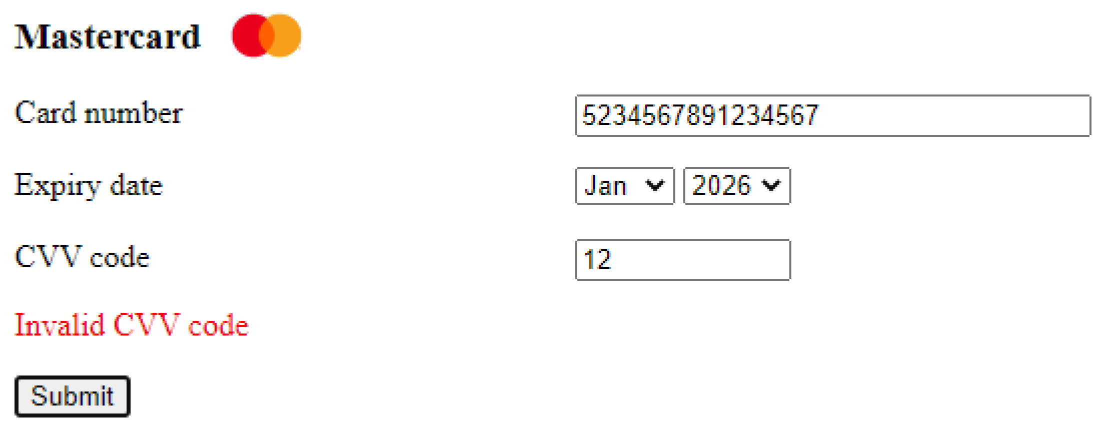
Card number	5234567891234567
Expiry date	Jan 2023
CVV code	123

Expiry date is in the past

If the card number is in the correct format, the expiry date is then checked to ensure it is not in the past, in which case the error message reflects this and the process stops.



```
const cvvTest : RegExp  = /^[0-9]{3,4}$/
if(!cvvTest.test(cvvCode)){
    errorMsg.innerHTML = "Invalid CVV code";
    // location.reload();
    return;
}
```

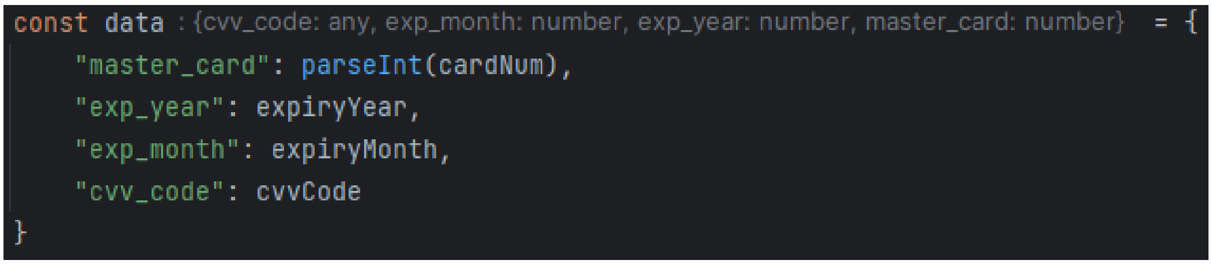


Mastercard

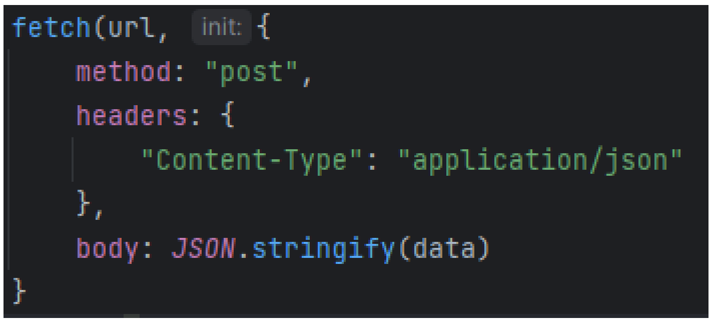
Card number	5234567891234567
Expiry date	Jan 2026
CVV code	12

Invalid CVV code

If the expiry date is also valid, another regular expression is used to check the cvv code to ensure it consists of 3 or 4 digits. Again, if this fails, the user is notified and the process will not continue.

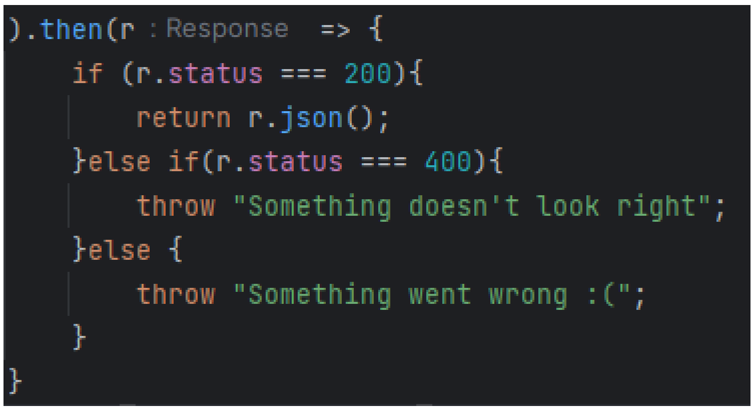


```
const data : {cvv_code: any, exp_month: number, exp_year: number, master_card: number}  = {
    "master_card": parseInt(cardNum),
    "exp_year": expiryYear,
    "exp_month": expiryMonth,
    "cvv_code": cvvCode
}
```

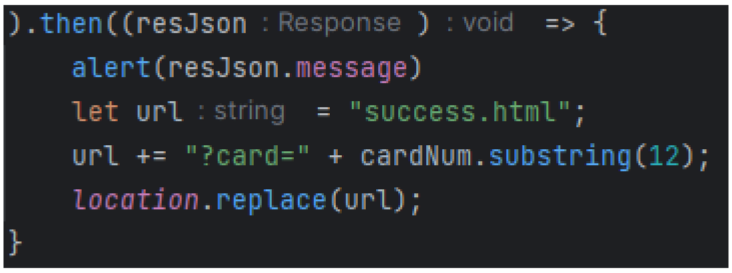


```
fetch(url,  init: {
    method: "post",
    headers: {
        "Content-Type": "application/json"
    },
    body: JSON.stringify(data)
}
```

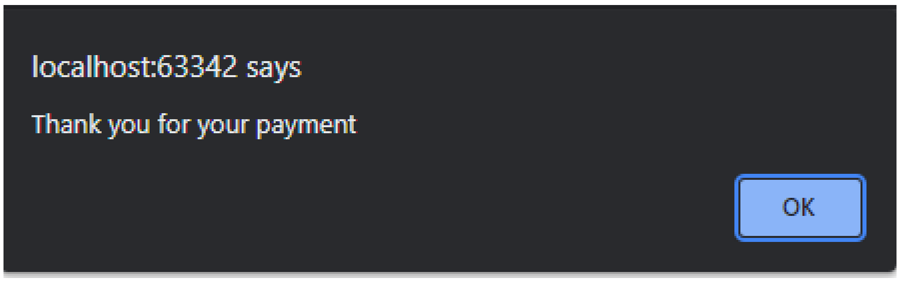
If all the checks are successful, the data is then prepared in JSON format and sent to the API using a POST request.



```
).then(r : Response  => {
    if (r.status === 200){
        return r.json();
    }else if(r.status === 400){
        throw "Something doesn't look right";
    }else {
        throw "Something went wrong :(";
    }
}
```



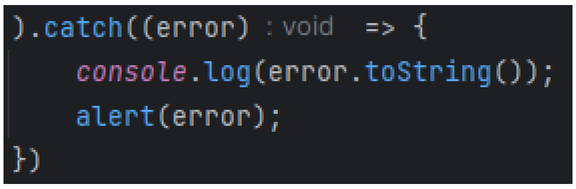
```
).then((resJson : Response ) : void  => {
    alert(resJson.message)
    let url : string  = "success.html";
    url += "?card=" + cardNum.substring(12);
    location.replace(url);
}
```



localhost:63342 says

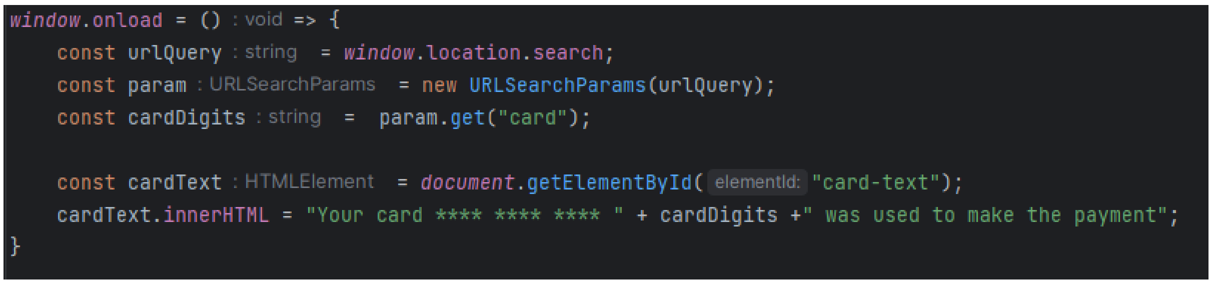
Thank you for your payment

If the request is successful, and the server returns status 200, the response message is shown to the user before showing the success page (success.html).
In order to display the last 4 digits of the card number on the success page, the digits are given as query parameters in the URL.



```
).catch((error) : void  => {
    console.log(error.toString());
    alert(error);
})
```

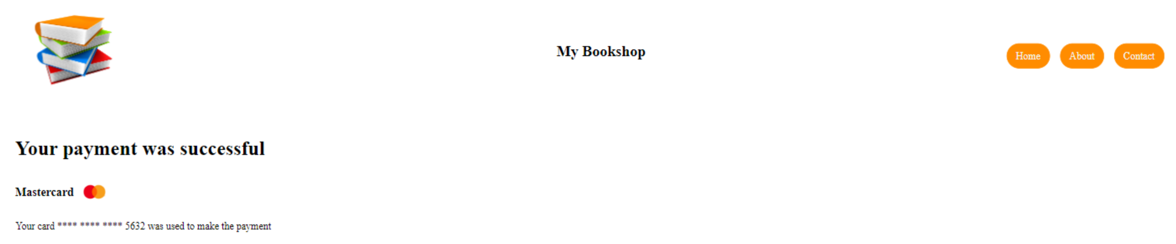
If the request is unsuccessful or there is an error, it will be caught and a message shown to the user.



```
window.onload = () : void => {
    const urlQuery : string  = window.location.search;
    const param : URLSearchParams  = new URLSearchParams(urlQuery);
    const cardDigits : string  =  param.get("card");

    const cardText : HTMLElement  = document.getElementById( elementId: "card-text");
    cardText.innerHTML = "Your card **** **** **** " + cardDigits +" was used to make the payment";
}
```

Desktop view of success.html

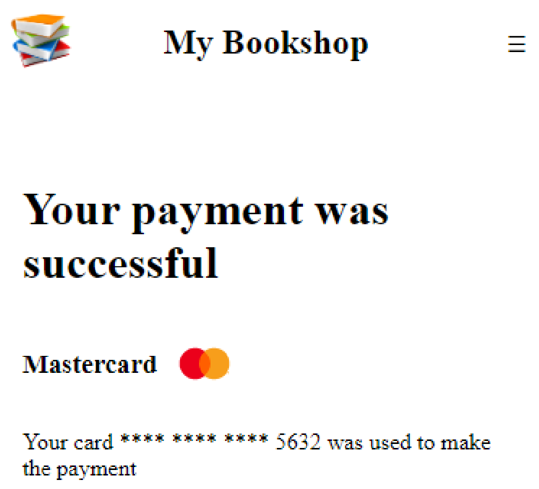


Your payment was successful

Mastercard

Your card **** **** **** 5632 was used to make the payment

Mobile view of success.html



Your payment was successful

Mastercard

Your card **** **** **** 5632 was used to make the payment

On the success page, the query parameter holding the card digits is parsed from the url and then the text in the <p> element is updated to show the last 4 digits of the card used to make the payment.

Section D: Usability and Accessibility

A number of features and considerations make the website user friendly and accessible:

- Responsive design - the website is designed to be responsive and adapt to the size of the viewers screen. The homepage switches between one or two columns depending on the width of the screen, and the payment page will show the label next to or above each input depending on the space available. This avoids the content being too small to see, or elements being displayed incorrectly on smaller devices. The navigation bar also collapses into a hidden menu on smaller screens, so that it is not taking up a large part of the screen and the main content of the page is not obstructed or distracted from.
- Consistent styling - a single css file is used to style all the pages across the website. This ensures that styles are consistent, such as the title and navigation bar, and the credit card headings on the payment and success pages.
- Layout - the layout of the pages is simple and easy to navigate. There is not too much content and content is spaced appropriately. Responsive design allows the website to adapt to different screen sizes whilst maintaining a user-friendly layout.
- Alt text - using the alt attribute to provide alternative text for images means that users who can’t see the image or use a screen reader will be able to understand and navigate the website easily.
- Language attribute - declaring the language assists search engines and browsers

References

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