CHALMERS
EXAMINATION / TENTAMEN

Course code/kurskod	Course name/kursnamn			
DIT342	Web Development			
Anonymous code Anonym kod		Examination date Tentamensdatum	Number of pages Antal blad	Grade Betyg
DIT342-[illegible] 0007-HNH		3.1.2023	15	5

:onfirm that I've no mobile or other similar electronic equipment available during the examination.
g intygar att jag inte har mobiltelefon eller annan liknande elektronisk utrustning tillgänglig under
:iminationen.

lved task handlade uppgifter o/nr		Points per task Poäng på uppgiften	Observe: Areas with bold contour are to completed by the teacher. Anmärkning: Rutor inom bred kontur ifylles av lärare.
1	X	18	
2	X	14	
3	X	20	
4	X	20	
5	X	10	
6	X	4	
7	X	8	
8	X	3	
9			
10			
11			
12			
13			
14			
15			
16			
17			
Bonus poäng			
Total examination points		97	

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Anonymous code / Anonym kod: DIT342-~~[illegible]~~0007-HNH

Points for question (to be filled in by teacher) / Poäng på uppgiften (ifylles av lärare)

Consecutive page no. / Löpande sid nr: 1

Question no. / Uppgift nr: 1

Question 1.1

Insert at line 12

```
app.get('/wikis', function (req, res) {
      const order = req.query.sort ?? 'asc';
      const sortedPages = sortByTitle(pages, order);
      const linkedPages = sortedPages.map((page,i)=> {
      return {
      title: page.title,
      links : [
            {
               rel: 'self',
               href: '/wikis/' + ~~page.title~~ i
            }
         ]
      }
   });
   res.json(linkedPages)
});
```

✓

~~Note: The code assumes that the title is a unique property of a page.~~

Note: I was unsure about the path naming so I assume that wikis are pages.

Answer only one question on this page. Do not write on the back of this paper

CHALMERS	Anonymous code / Anonym kod	Points for question (to be filled in by teacher) / Poäng på uppgiften (ifylles av lärare)	Consecutive page no. / Löpande sid nr
	DIT342-0007-HNH		2
			Question no. / Uppgift nr 1

1

Question 1.2

Insert at Line 17

```
app.get('wikis/:wiki', function(req, res) {
    const pageIndex = req.params.wiki;
    const page = pages[pageIndex];
   res.json(page);

 });
```

✓

Note: I was not sure about the path naming so I assume that wikis are pages.

1 8

Question 2.1
I would expect the given page (i.e the request parameter of page) to be deleted from the server. A status code of 204, with either an empty body or the deleted page object should be included in the response. ✓

Question 2.2
A GET request is safe, meaning that it does not alter, or rather should not alter any data on the server. This combined with the fact that HTTP is stateless, makes it very difficult to account for unique visits, as every page reload will be counted. A better approach might be to convert this to a post request, in which case a database table can be used to track the unique visits based on unique attributes such as the requester's IP address. ~~Another approach~~ ✓

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DIT342-0007-HNH		4
		Question no. / Uppgift nr 2

Question 2.3

Both POST and PATCH requests are unsafe, meaning that they modify resources on the server. However, they have different usecases, a POST request for example, generally aims to create new resources on the server, whereas, a PATCH request generally is used to update a sub part of an existing resources. In the given api, a POST request to /wiki/pages will create a new page on the server, whereas the given Patch request at /wiki/pages/:page/attachments will update the attachments of the given page. Another key difference between the two is idempotency, a POST request is unsafe whereas a PATCH request is ~~Unsafe and ~~idp~~ idempotent~~. This means that the same POST request, in the context of our API, sent multiple times will create multiple new pages, whereas ~~the same PATCH request sent multiple times will only modify the given properties of the page, in effect changing nothing apart from the initial change from the very first request.~~ ? not necessarily

4

Answer only one question on this page. Do not write on the back of this paper

1

CHALMERS	Anonymous code / Anonym kod	Points for question (to be filled in by teacher) / Poäng på uppgiften (ifylles av lärare)	Consecutive page no. / Löpande sid nr 5
	DIT342-0007-HNH		Question no. / Uppgift nr 2

Question 2.4

~~GET /wiki/pages/ Page 15~~

```
GET /wiki/pages/15     HTTP/1.1
SERVER: http://localhost:3000/
ACCEPT: application/json
COOKIES: "{session: 1234}
```

✓

1/4

Answer only one question on this page. Do not write on the back of this paper

CHALMERS	Anonymous code / Anonym kod	Points for question (to be filled in by teacher) / Poäng på uppgiften (ifylles av lärare)	Consecutive page no. / Löpande sid nr
	DIT342-0007-HNH		6
			Question no. / Uppgift nr: 3

Question 3

Line 16

```
<p class ="selector"> Here is some text.</p>
```

Line 17

```
It may be in <span id = "highlight"> different colors </span>.
```

Line 18

```
<div style = "color: pink" >
```

Line 20

```
text <span> can change </span> colors.
```

Line 23

```
<p lang ="fr" > Oui.</p>
~~<p~~
```

Line 24

```
<p lang = "en" > No. </p>
```

Line 25

```
<p style =" display: none" > Should not be displayed at all </p>
```

Conflict resolution is covered on the next page

⟶

CHALMERS	Anonymous code / Anonym kod	Points for question (to be filled in by teacher) / Poäng på uppgiften (ifylles av lärare)	Consecutive page no. / Löpande sid nr
	DIT342-0007-HNH		7
			Question no. / Uppgift nr 3

Question 3

Conflicting CSS definitions are resolved by a concept known as CSS specificity, which is a value that can be calculated from the CSS selectors that are used. Generally speaking, the heiracrchy usually somewhat as the list below.

1. inline-styles
2. id selector
3. class selektor
4. tag selectors.

In our example, to make the first line orange I give the paragraph a class of selector, which overrides the general paragraph selector that has a grey color.

On line 18, I give the div an inlinee styles color of pink which overrides all other color definitions for the div.

On line 17, in order to make the span text yellow, I give it an id of highlight which overrides the general div> span rule of color black.

✓

CHALMERS | Anonymous code / Anonym kod: DIT342-0007-HNH | Points for question (to be filled in by teacher) / Poäng på uppgiften (ifylles av lärare) | Consecutive page no. / Löpande sid nr: 8 | Question no. / Uppgift nr: 4

Question 4.
Insert at line 9

```
<table>
    <tr>
        <th> Shortname </th>
        <th> Fullname </th>
    </tr>

    <tr v-for="course in courses">
        <td> {course.short} </td>
        <td> { course. full } </td> ✓
    </tr>

</table>

<label for ="short_name"> Short name: </label>
<input type = "text" id = "short_name" :v-model="to_add_
short" />
<label for = "full_name" > Full name : </label>
<input type ="text" id=" full_name" :v-model=" to_add_full"/>

< button @click = "addCourse" > Add course </button>
```
✓

Answer only one question on this page. Do not write on the back of this paper

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		Question no. / Uppgift nr: 4

Question 4

Insert at line 23

```
add Course : function () {

  const newCourse = {
    short : this. to_add_short,
    full : this. to_add_full
  }

  this. courses. push (newCourse)
  this. to_add_ short = '' ;
  this. to _add_full = '' ;

}
```

✓

2.0

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Points for question (to be filled in by teacher) / Poäng på uppgiften (ifylles av lärare)

Consecutive page no. / Löpande sid nr: 10

Question no. / Uppgift nr: 5

Question 5.1

If the domain IP address is not cached by my local DNS proxy, I will iteratively move up the chain of DNS proxies until a match is an example chain may go from local to ISP to global (for the lack of a better word), global ~~then~~ refers to large DNS providers such as Google or Cloudflare which almost guarantee that a match will be found, if the domain is valid. Once a match is found the request will then be forwarded to the appropriate IP and the DNS will be cached for later use.

Not quite

2

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Question 5.2

When the user presses enter or go after typing in the URL, a sychronous GET request is sent to the server, which responds with 200 and the basic markup and javascript required for the application, the markup is basic because generally SPAs are client side rendered. On the page load another GET request on a URL such as http://www.mycoolwiki.com/api/wikis, this should ideally return a status of 200 and the body should contain an array of wiki pages. This request should ideally be asynchronous in order to reduce the "time to interactive" measure. When the user clicks on a page, another asynchronous GET request is sent at a URL such as http://www.mycoolwiki.com/api/wikis/5, this should ideally respond with 200 and a page object containing further details about the specific page which will be used in rendering the editing interface. Finally, when the user presses "submit changes", a PATCH request is sent to http://www.mycoolwiki.com/api/~~[illegible]~~ ~~which~~-/wikis/5, which makes the requested changes and responds with 200 and a body containing the update page object.

Question 6

The virtual DOM is a concept popularized by several mainstream javascript frameworkss. The idea is that the frameworks, keeps track of a virtual Document Object Model, which is not the same as the actual Document Object Model shown to the user. ~~when~~ All changes ~~are~~ made go to the virtual DOM, after which the framework can efficiently and seamlessly update the actual DOM to reflect the virtual DOM. This allows for a much nicer developer experience, shifting the focus from DOM manipulation using the document API, ~~to creating sleek user centric applications.~~ allowing the developers to focus on the more important features of their application.

✓

Question 7

There are several approaches that can be used to test the frontend. The smoke test can be used where the application is used until it ~~stargts~~ starts "smoking". The monkey test can also be used to find unforseen bugs in the frontend, as the strategy revolves around random input. These strategies can work well for a small project, however, as the project scales, a better approach would be introduce something like Selenium to systemically test the application using a headless browser.

~~A~~ Similarly, there are several approaches for testing the backend, a good approach is unit testing which aims to test a so-called unit of the application (whether that is a class or method ~~for~~). This ~~has~~ is a tried and tested approach that works well. ~~For~~ Another approach can be to test the responses from the api, to ensure that they contain the expected data, this can be achieved and automated by using something like the postman cli.

As far as testing the application as a whole, there are a few good alternatives.

Continues →

Question 7 Continued

A/B testing ~~[illegible]~~ can be used for the application as a whole, in which two (or more) versions of the application are rolled out to a subgroup of users in order to determine which one performs better in a production environment. Integration testing using selenium can also be implemented, to test how the Frontend integrates with the backend. Similarly, integration testing for the backend and database can also be implemented.

✓

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1

Anonymous code / Anonym kod	Points for question (to be filled in by teacher) / Poäng på uppgiften (ifylles av lärare)	Consecutive page no. / Löpande sid nr
DIT342-0007-HNH		15
		Question no. / Uppgift nr 8

Question 8

Hoisting is a concept in javascript which describes the movement of variable declarations to the top.

Lookin at the example program below:

```
x = 5;
var x;
console.log (x);
```

The program will output 5, ~~this is~~ even though the variable is being declared after it has already been assigned a value. This is because the javascript engine moves the variable declarations to the top, so the programs executes in the following way:

```
var x;
x = 5;
console.log (x);
```

✓