Solution 2

Quebec

Daniel Kostic, Guilherme Fial, Igor Fedotov, Stefan Vujovic

Exercise 1: HTTP

a) Is a HTTP-based communication between a client and a server synchronous or asynchronous?

HTTP-based communication is synchronous. In this type of communication, the client sends a request to the server and the server responds to the request with the required information. Furthermore, the server would never send a response without a former request from the client. We can observe this behaviour when a user interacts with a web interface in a web browser, the browser (client) requests information from the server based on the user interaction, and the server responds the request by providing a new presentation for the user.
If *Ajax* technology comes into play, this synchronous process is unchanged. While the use of *XmlHttpRequest* and *Ajax* techniques facilitates a more fine-grained interaction model than a full-page refresh, the requests are still generated based on user interaction, so the process remains synchronous.

b) Is the HypertextTransferProtocol stateless or stateful?

We know that:

- Stateless means there is no memory of the past. Every transaction is performed as if it were being done for the very first time.
- Statefull means that there is memory of the past. Previous transactions are remembered and may affect the current transaction.

The HTTP protocol treats each request as an independent transaction that is unrelated to any previous request, therefore this protocol is stateless.
From the user's perspective, it may not seem so due to session management by the server, the server is able to track requests originating from the same client therefore adding some sort of statefullness on top of the HTTP.

Exercise 2: JavaScript

a) How can external JavaScript files be included into HTML?

External JavaScript files can be included into the HTML by adding the *<script>* tag with the path or link to the desired files specified in the *src* attribute of the tag.
A *<script>* tag with the *src* attribute specified behaves exactly as if the contents of the specified JavaScript file appeared directly between the *<script>* and *</script>* tags.

b) Where in a HTML page can JavaScript code be embedded?

JavaScript can be embedded in the HTML page by enclosing the JavaScript code between the *<script></script>* tags.
The *<script>* tags may appear enclosed 1 level deep in the *<head>* or *<body>* tags of the HTML page.

Exercise 3: Ajax

1. Considering this figure, please explain how Ajax differentiates from classic web application models from:

a) The technical point of view

Ajax differentiates from the classic approach in the way that it allows fetching partial page information, as opposed to loading the full content each time (e.g. load more comments on a social media webpage).
In the classic approach the server processes the request and sends the complete response in the form of an HTML file, so whenever a new request is sent the server replies with a new HTML file. On the other hand, by using *Ajax's* asynchronous requests the server responds only with the specific part of the information/page (using various formats, most commonly XML and JSON) without the need of the whole HTML file.

b) The user point of view

From the user's point of view the page is dynamic, it does not refresh or reload after every single action, providing a much more fast and interactive experience (*e.g.* Getting suggestions as words/sentences are typed in a field).

2. Please provide an example of a web application that uses Ajax.

Facebook™. A few examples:

- Whenever we scroll to the bottom of the feed, more posts are loaded because in the background an *Ajax* request is sent to the server.
- Whenever we post a comment, it is displayed right away without reloading the page.
- Using the chat functionality.

Exercise 4: Introduction to modelling