

**CSEN503 Introduction to Communication Networks**  
Winter Term 2021  
**Project Description**

## **1. Introduction**

The objective of this project is to give you an experience in developing a network application based on the client/server architecture. You are required to build a web application that is used as a simple shopping website. The website allows the users to lookup products descriptions, types, manufacturers... etc. Users should be allowed to create an account, add items to their “cart” and search for products. The website should initially be hosted on your PCs “local host” and when the site development phase is done, you should host it online on the cloud platform [heroku.com](https://heroku.com).

## **2. Components:**

- **Users Login (Main Page):**  
Registered users should be allowed to log in to their accounts using their stored username and password. If an unregistered user tries to log in an error message should be displayed.
- **User Registration:**  
Users should be allowed to create an account using a unique username and a password and the users' information should be stored in a database using MongoDB. If the user tried to register using an already taken username, an error message should be displayed.
- **Home Page:**  
The home page is the first page that should be encountered by the users when they log in to their accounts. It contains several item types and a button to view the user's “cart”. When the user clicks on any item type, they should be redirected to that type's page.
- **Type Page:**  
The type page contains all the items within this type. When a user clicks on any item's name, they should be redirected to that item's page.
- **Item Page:**  
The item page contains a description for the item. The page should also contain an embedded link for a video describing the item which can be streamed by the user. Please don't copy the video itself to the folder so that it doesn't exceed the allowed size. Finally, an “add to cart” button should be added. The button adds this item to the user's “cart” in the database.
- **Cart Page:**  
The cart page contains the items that the user previously added using the “add to cart” button. A “view cart” button should be added to the home page that directs the user to their own cart page.

- **Search:**

A search bar will be displayed in all pages except for the registration and login pages. The search will be done using items names only. The search result is either an “item not found” message if the item was not available in the database or a list of the items that contain the search keyword in their names. The search results should be clickable and they direct you to that specific item’s page.

### 3. Deployment:

After developing your web application locally on your pc, you should deploy the website on an online cloud. We will be using the following technologies for the deployment phase:

#### 3.1 Heroku

Heroku is a cloud platform that gives the developers all of the tools and infrastructure needed to deploy their applications to a production ready server. You should create an account on heroku.com. In addition, you should download and install the Heroku Command Line Interface (CLI) to make it easy for you to create and manage your Heroku applications directly from the terminal.

You can download the Heroku CLI through the following link:

<https://devcenter.heroku.com/articles/heroku-cli#download-and-install>

There are different strategies used for deploying the applications on Heroku. The simplest and most common approach is to push your code from a Git repository to a Heroku app.

#### 3.2 Git

Git is a free and open source distributed code management software. It is a version-control system for tracking changes in the source code during software development. You can download and install it through the following link:

<https://git-scm.com/book/en/v2/Getting-Started-Installing-Git>

To set up Git for the first time, please follow the instructions on the following link:

<https://git-scm.com/book/en/v2/Getting-Started-First-Time-Git-Setup>

### 4. Technologies:

- **Node.js:**

Node.js is an open source platform for executing JavaScript language outside the browser (JavaScript run-time environment). You can install Node.js through the following page:

<https://nodejs.org/en/download/current/>

When the installation is done, a tool called NPM (node package manager) is also installed. NPM is used to install node packages directly through the terminal (command prompt). To know more about NPM and the available packages visit [npmjs.com/](https://npmjs.com/)

- **Express:**

Express is a node package that is used as a web application framework. Express can be installed directly through the terminal using the command “*npm install -g express-generator*”. Express is the package responsible for running the web server.

- **Visual Studio Code (VSCode):**

VSCode is the IDE that will be used for developing the web application. VSCode has a built-in support for JavaScript, HTML and several other languages. Furthermore, it has a built-in terminal that can be used directly to execute commands.

- **MongoDB:**

MongoDB is a NoSQL database program. MongoDB uses JSON-like documents with optional schemas. You can create an account on MongoDB using this link:

<https://account.mongodb.com/account/register>

Then use MongoDB Atlas to create your online database. Finally install the MongoDB library for Node.js using the command “*npm install mongodb*” and connect to your online database using Node.js.

- **Embedded JavaScript (EJS):**

EJS is a template engine that allows the user to generate HTML with plain JavaScript. It allows you to load data from your application in the view. After the template is rendered, it generates an HTML file for the browser.

## 5. Provided Files:

You will be provided with the .ejs (HTML) files containing the basic view for your website. The files will contain plain HTML. Therefore, it is your responsibility to connect these views (frontend) with the server logic (backend) by writing JavaScript code. You should download the zipped file and then add the provided files to your project by following the instructions provided within the zip file.

## 6. Submission:

**Deadline:** Saturday, 1<sup>st</sup> of January, 2022, 11:59 pm

You are required to develop all the features of the website. Check the previous sections for all the details. After finishing the development phase of your application, you need to deploy it on Heroku cloud (please refer to the deployment section).

**Submission Guideline:** Please upload your zipped project (**without the *node\_modules* folder**) on the following form together with the Heroku link of your website (**maximum file size: 10MB**):

<https://forms.gle/vCWsNp6372geNvaGA>

## 7. Resources:

- JavaScript Tutorials:

<https://www.w3resource.com/course/javascript-course.html#/>

<https://www.w3schools.com/js/>

- NodeJS and Server Installation:

<https://www.pluralsight.com/guides/getting-started-with-nodejs>

- Creating a Simple Website Using Express:

<https://codeforgeek.com/express-nodejs-tutorial/>

- HTML Basics:

<https://firstsiteguide.com/html-for-beginners/>

- MongoDB:

<https://www.mongodb.com/nodejs-database>

<https://www.mongodb.com/blog/post/quick-start-nodejs-mongodb-how-to-get-connected-to-your-database>

<https://docs.atlas.mongodb.com/sample-data/>