# Project Proposal

## SOFT355 Distributed Application Development

Proposal title: To-do List Web Application

Student number: 10555972

## Functionality

The project that I am proposing to create is a To-do list web application. User’s will be able to login and create new items with descriptions, level of importance, and deadlines. Items will be able to be categorised into categories created by the user. User’s will also be able to link items to other users who use the application, allowing more than one person to make changes/complete an item.

## Required properties

### Interactive

User’s will be able to interact with the application by using a web browser either on a computer or on a mobile device.

### Distributed/Parallel

The application will be hosted either locally or in the cloud using a webserver. Allowing any device to access it. I will be using WebSockets to allow for the web browser to interact with the web server.

### Structured

Main Classes:

* Users
* To-do items
* Categories

Main Function:

* Signing Up
* Logging in
* CRUD functionality of a to-do item
* Ability to share to-do items with other users on the application
* Push notifications when shared items are updated (maybe an inbox could be used)

Files:

In terms of my file structure, most of the data will be stored using MongoDB which means that it will be stored in JSON files.

Design Patterns:

I will be using multiple design patterns throughout my application when the implementation is completed. For example, I will be using the singleton pattern when a user logs into the system as only one user will be active at any one time on a connection. In addition to this I will also be using the observer pattern when a category of items is changed, all the items within that category are updated as well.

## Planned Work

### Resources

A computer will be used to create the application and it will be hosted in the cloud on Amazon Web Services. Node.js will be used on the server-side and will allow me to create a network application that will run across distributed devices. In line with Node.js I will also be using Express to allow me to add simple routing throughout my application.

I will be using MongoDB for my database as it allows for fast and scalable data storage without having to use any SQL. It also stores all if the information in JSON files which is an advantage. jQuery is a JavaScript library that I will use as it will allow me to simplify my JavaScript code by using a lot of its pre-defined methods. In terms of the front-end I will be using Angular for the logic of the web pages and I will be using Bootstrap for the styling of the pages.

I will be using Mocha and Chai to help with testing my application as it is being developed. I will also be using the Cucumber framework to help with user testing.

### Testing

In terms of testing I will use multiple types of testing to help ensure the usability of my application. I will be using test driven development and as said previously I will be using Mocha and Chai to create and run unit tests while developing my application. This will allow me to set up automated tests that will run every time code is changed and ensure that bugs are fixed as soon as possible.

To help incorporate some behaviour driven development I will use the cucumber framework as it allows user stories to be tested in plain English for users to read who cannot read code.

I will also complete usability testing, this involves communicating with users to ensure that all features are included and are usable by the user. Features will be tested multiple times throughout the design and implementation process. I will record sessions with users to get valuable feedback.

### Work Plan

* Planning – 10hrs
  + This stage will consist of gathering ideas and getting a clearer understanding of what the task at hand is.
  + It will involve researching similar products to see what is done well and not so well.
* Design – 20hrs
  + During this stage I will start designing page layouts and other visual content.
  + I will also design the backend such as class diagrams and file structures.
* Development and Implementation – 35hrs
  + Using all my designs, this stage is bringing them to life and creating a functional website.
  + This also includes ensuring everything in the back-end of the application is developed as well.
* Testing – 15hrs
  + Although this is at the end, the testing stage does occur throughout the entire project.
  + A final set of tests will be conducted once the implementation is complete.
  + Test will consist of unit tests and user tests.