# School of Computing
# CA326 Year 3 Project Proposal Form

**SECTION A**

Project Title: Daily Activity Predictor

Student 1 Name: Ayoub Al-Kendi ID Number 20106378

Student 2 Name: Michael Regan ID Number: 22112111

Staff Member Consulted: Liting Zhou

## Project Description (1-2 pages):

## Description:

Our project idea is to create a system capable of accurately predicting an individual's daily activities. We will create a Web app where users can continuously log their daily activities. The user interface will be presented as a calendar with logged activities. There will then exist a Long Short Term Memory (LSTM) time series forecasting system that will accurately predict the user's future daily activities. Such a system is useful to users as it can suggest activities that they might be interested in doing, for example, our system could predict that a specific user has a high probability of going to the gym at 5 p.m. on a particular day. Hence, it can remind them.

Our LSTM model will be trained using either data provided by Lifelog dataset and data collected through a survey we will conduct on our friends and family. The model will have limitations to the activities it can predict so it will only be able to predict predetermined activities such as sleeping, gym, grocery shopping, cooking, laundry etc. The survey we would conduct would ask our participants to reflect on a predetermined time period such as a month and record when they did these activities. Other data might be recorded such as their age and gender, and our project will abide by ethical standards and GDPR.

We will be using the Python and the Pytorch library to code the LSTM model, the Pandas library for data manipulation and analysis, and NumPy for working with high level mathematical functions. We have chosen to develop an LSTM model due to its ability to make sequence predictions that requires long term dependency data. Traditional Recurrent Nural Networks (RNN) suffer from the long term dependency problem, meaning over time the model becomes increasingly inefficient. LSTM adds an LSTM cell to RNN computations which filters out irrelevant data and retains import information. That is why we believe LSTM is a good fit for our system that will forecast when our users will be partaking in daily activities.

We will make a calendar that will be used to record users' activities where users will log activities that they have done. The calendar will be made using a React.js frontend and will fetch and post to a Django backend. Our web page will be hosted either on our own personal machines or using third-party web hosting such as AWS. Furthermore, our potential survey will also implement the Django framework to collect data.

To conclude, we will be making a system that accurately predicts the activities in a person's daily routine. Our hope is that users of our system will track their daily activities and find it useful in reminding them of activities they would likely partake in.

## Division of Work:

We will be working concurrently on the project and delicate tasks accordingly.

## Programming Languages:

- Python
- Javascript

## Programming Tools:

- Django
- React
- Pytorch
- Pandas
- NumPy

## Learning Challenges:

- Learn Pytorch
- Learn Pandas
- Learn NumPy
- Learn about hosting web apps
- Learn about machine learning

## Hardware/ Software platforms:

- Laptops
- Lab machines
- Third party web hosting e.g AWS
- Potentially running AI on a personal GPU.

# Special Hardware / Software Requirements:

- Access to Lifelog's datasets