# Individual Report: Ramya Shanmugam (A0229958H)

## Personal Contribution & Learning Journey

I was heavily involved in discussion for project idea generation, selection. As the Technical Lead, I proposed to the team on technical stack that we could use in this project. I helped the team in creating up the basic setup for the application using Python Flask and Angular for development and MongoDB for the database from a scaffold project, along with the integration of Mycroft.AI for the user input. I also guided the team in learning the programming of technical stack enabling them to code effectively to finish the project on time.

I started on learning about the Mycroft.AI integration and Skill creation using Python programming and understanding the flow of the cognitive system. Then I proceeded to create a new skill in Mycroft.AI that enables the cognitive system to listen to 'intent' from user 'utterance' and provide a random 'response' from the predefined set of responses. I also created a function in the skill to write the user speech input as text into a file and push that file into NLP preprocessing api created in 'Hey Nurse!' code base.

In the backend, I created 'User schema' and 'Session schema' using Marshmallow and the respective service files for creating, deleting, updating, reading records from/to the database using pymongo in python programming. I also created the appropriate apis and functional logic for the afore mentioned database actions. I also integrated 'sendgrid api' to send emails from the python environment.

For the frontend, I created the 'Login Page', 'Change Password Page', 'Admin Dashboard Page', 'Admin Statistics Page', 'User Profile Page'. I have also created 'Interceptor' for authentication and error handling. Followed by 'Guards' to stop unauthorized users from pages which access any page without login or non-admin users from accessing the 'Admin' related pages. I also created templates for emails that is being sent out from our application using 'SendGrid' website

## Learning Outcome

During the development of the project, I have learnt how the Cognitive system works and gained experience in backend development using Python Flask, Mycroft.AI Skill development with Python programming as well.

**Mycroft.AI:**

I was able to get a better understanding on how a Cognitive system works, when I was trying to develop a Mycroft.AI skill by adding the intents and dialogs. I was also able to find how the flow of information happens when an intent is detected, followed by the call to converse function which triggers the process flow required for the skill to accomplish the necessary end goal.

**Backend Coding:**

I understood how to write an api in Python using FLASK and to use multiple libraries such as JWT, bcrypt, sendgrid api, marshmallow and pymongo. I gained extensive knowledge on using marshmallow fields and the relevant 'dump', 'load' functionalities related to it. I also learnt how to use pymongo to communicate with Mongo DB and to get aggregate results as well. This project has also helped me understand the concept of coding using python language extensively with the use of 'panda dataframes'.

**Frontend Coding:**

I learnt the implementation and concepts of 'interceptors' and 'guards' when using the Angular Framework. I also gained a better knowledge of 'Flexbox' and its uses, against mainstream 'Grid system' in 'Bootstrap'. I came to know about the connection between models and the serializable fields that are returned as a response from api. I also learnt how to create responsive designing to fit all screen sizes using 'mediaquery'. I understood the parent-child relationship in scss classes.

## Knowledge & Skill Application

Working on this project has provided me intensive experience on creating a Full Stack Project using Angular, Python, ExpressJS and MongoDB. Thus, enhancing my skillset as a Full Stack developer.

Learning about the designing and structure of 'Mycroft.AI' has opened a world of opportunities on creating a Cognitive System. It also has provided me a deeper knowledge on the working on a few of the different classification models available. This project has provided me guidance on creating system models and flowcharts to be created on the functioning of a model before implementing the codebase there by providing a clear picture on the expected outcome from a particular input.

Working on a python background will help me in my current job as there has been a recent requirement for statistical data manipulation using python programming.

The experience I have gained from integrating multiple modules to make a fully functional system has provided me a valuable lesson which I can help practice in my workplace. I have also gained knowledge on using open-source packages to convert a text input to a file which can be sent over a http request a blob from backend and convert a blob into a readable file in the frontend.

Overall, this project provided an immense knowledge base for my career growth and a better chance of improving my skillset, thereby enabling me to be a better programmer in the long run.