Capstone Project I

Sprint 4

# Technological Requirements

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|  | **Technology** | **Name** |
| 1. | Database | Machine Learning Database (MLDB) |
| 2. | Programming Language | Python |
| 3.a) | Framework | TensorFlow |
| b) |  | PyTorch |
| c) |  | DialogFlow |
| d) |  | Keras |
| 6. | Hardware | Cloud Resources (Google Cloud, Azure) |

## Machine Learning Database (MLDB)

The Machine Learning Database (MLDB) is an open-source system for solving big data machine learning problems, from data collection and storage through analysis and the training of machine learning models to the deployment of real-time prediction endpoints. We are using this database for our project to address the issues that comes when we have large data to handle. This database handles big data properly and with a lot of speed optimisations.

Cons: Not familiar with everybody and needs and bigger learning curve

## Python

Python offers some competitive features when it comes to machine learning development, particularly complex analytics operations, and large-scale data handling. Python is useful because of its expressive and easy-to-read syntax. We have chosen python as our main programming language, because it’s easy to learn and provides a lot of flexibility and has a lot of useful libraries on hand because of its open source ness.

Cons: Doesn’t have any set of rules and thereby prone to errors.

## 3a. TensorFlow

TensorFlow 2.2, an open-source project by Google, offers a highly capable framework for executing the numerical computations needed for machine learning (including deep learning). On top of that, the framework provides APIs for most major languages, including Python, C, C++, Java, and Rust.

Because of its popularity and open-source ness, we are using it in our project. They are leading the market in Deep Learning, and we felt like it will satisfy our project needs. Also, it well integrates with python programming language which we will be using for our programming.

## 3b. PyTorch

PyTorch was developed by Facebook as an open-source platform for deep learning, highlighted by its ability to generate computational graphs that get processed at runtime. Python programmers can halt the interpreter to debug their application quickly and accurately, which is one of the biggest strengths of this highly capable framework.

It helps us in debugging our application at various stages, making our life easier and providing us with a lot of helpful tools to complete our tasks faster. The graphs feature in it helps us in imagining the result. And being open source is another benefit.

Cons: Even though it is open source, it’s under the hands of big companies. That’s a concern in long-term process.

## 3c. DialogFlow

Dialogflow is a natural language understanding platform that makes it easy to design and integrate a conversational user interface into your mobile app, web application, device, bot, interactive voice response system, and so on. Using Dialogflow, you can provide new and engaging ways for users to interact with your product.

It’s the best framework from google which we will be using throughout our application to make our chat bot at “Chat Bot”. Because, this framework converts all the TensorFlow responses into human dialogs, making them easier for humans to understand.

## 3d. Keras

Its an extension to TensorFlow, that works with tensor flow to give us neural network models, preconfigured APIs and so on. We will be using its features additional to TensorFlow in our application. The libraries from keras like SciKit-Learn will be very useful in training our machine learning models.

Cons: Keras is an advanced neural network library, meaning the syntax can be challenging for some to navigate. It might also be frustrating when Keras-based algorithms return multiple, low-level errors even when performing the most basic computations.

## Cloud Computing (Google Cloud, Azure)

For this project, we are going to host and use all the technology from cloud servers. This makes our life easier in both configuring and providing various features. Google provides TensorFlow and Keras APIs in their cloud platform. Similar platforms are available in Azure too. Also, they provide us with automation and easy deployment.

Cons: Controlled by remote servers and need to subscribe monthly.

# Learning Plan

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|  | **Technical Skill** | **Jerish** | **Sanjay** | **Naveen** | **Jesse** |
| 1. | DataBase Skill | 90% | 60% | 80% | 60% |
| 2. | Python | 70% | 90% | 50% | 70% |
| 3. | Problem Solving | 80% | 80% | 80% | 80% |
| 4. | TensorFlow | 40% | 40% | 40% | 40% |
| 5. | Cloud Computing | 100% | 60% | 50% | 50% |
| 6. | FrontEnd | 60% | 80% | 70% | 80% |
| 7. | PyTorch | 40% | 40% | 40% | 40% |
| 8. | Keras | 0% | 0% | 0% | 0% |
| 9. | Dialog Flow | 50% | 50% | 50% | 50% |
| 10. | Machine Learning | 80% | 80% | 70% | 70% |

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|  |  | **Jerish** | **Sanjay** | **Naveen** | **Jesse** |
| 1. | Responsibility | Full Stack Development | FrontEnd Programming | BackEnd Database | FrontEnd and backend support |
| 2. | Learning Resource | Google Resources,  Other programming res | Google Resources,  React Dev tutorials | Google Resources,  Backend database | Google Resources,  Core programming res |
| 3. | Start Date | 12/07/2021 | 12/07/2021 | 12/07/2021 | 12/07/2021 |
| 4. | End Date | 01/07/2022 | 01/07/2022 | 01/07/2022 | 01/07/2022 |