

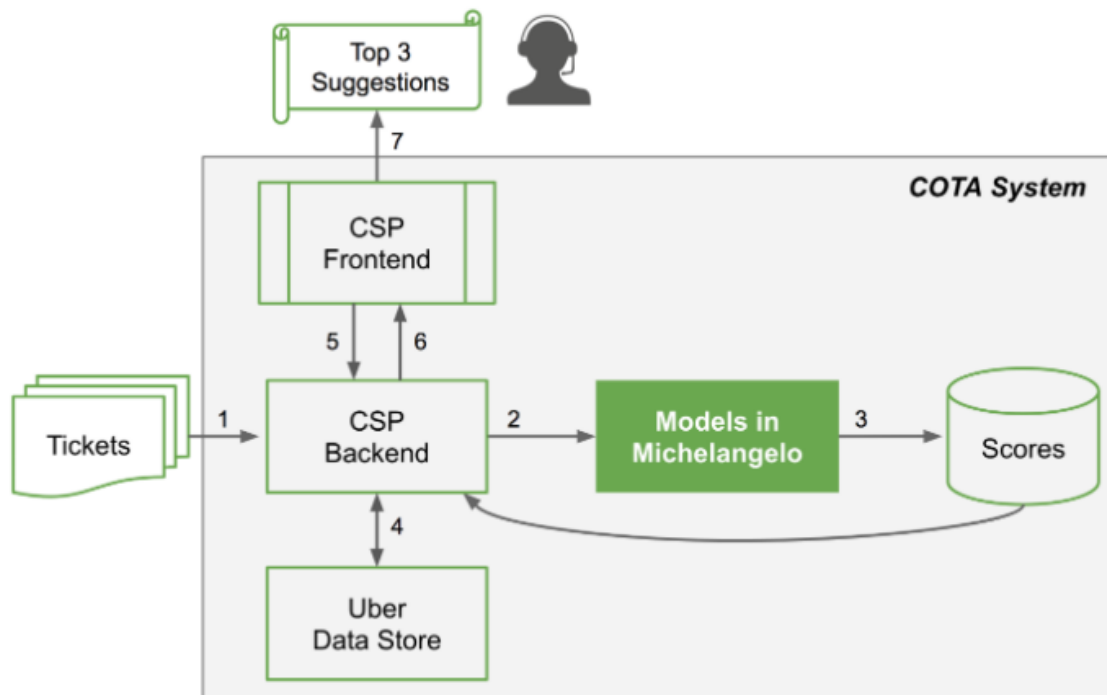
## Artificial Intelligence: An Introduction Assignment 2

‘How might AI be used to aid customers’ decision-making about their fitness and wellness?’

Artificial Intelligence (or AI) defines (1, Unit 1, p.3) “The capacity of computers or other machines to exhibit or simulate intelligent behaviour; the field of study concerned with this.” Designed as advancement models created from machines to demonstrate higher intelligence than human intelligence. In 1950, Turing (1, Unit 1, p.3), experiments if computers are superior compared to human intelligence. His conclusion he discovered that a machine (AGI) can capture human intelligence and their decision making based on circumstance. This can have many advantages and disadvantages in our society, where in some cases it can be problematic within our environment. Raising concerns on customers satisfaction and their health relies on their importance for survival. Solving these issues requires a high level of maintenance, functionality, and stability in the substantial long term done by man-made. May vary on certain technologies, applied in software, and AI systems that we have usage. To develop a wrist-based tracking device for a start-up fitness start-up company. Are essential to aid customers well-being and their fitness to help create achieve better decisions using Artificial Intelligence.

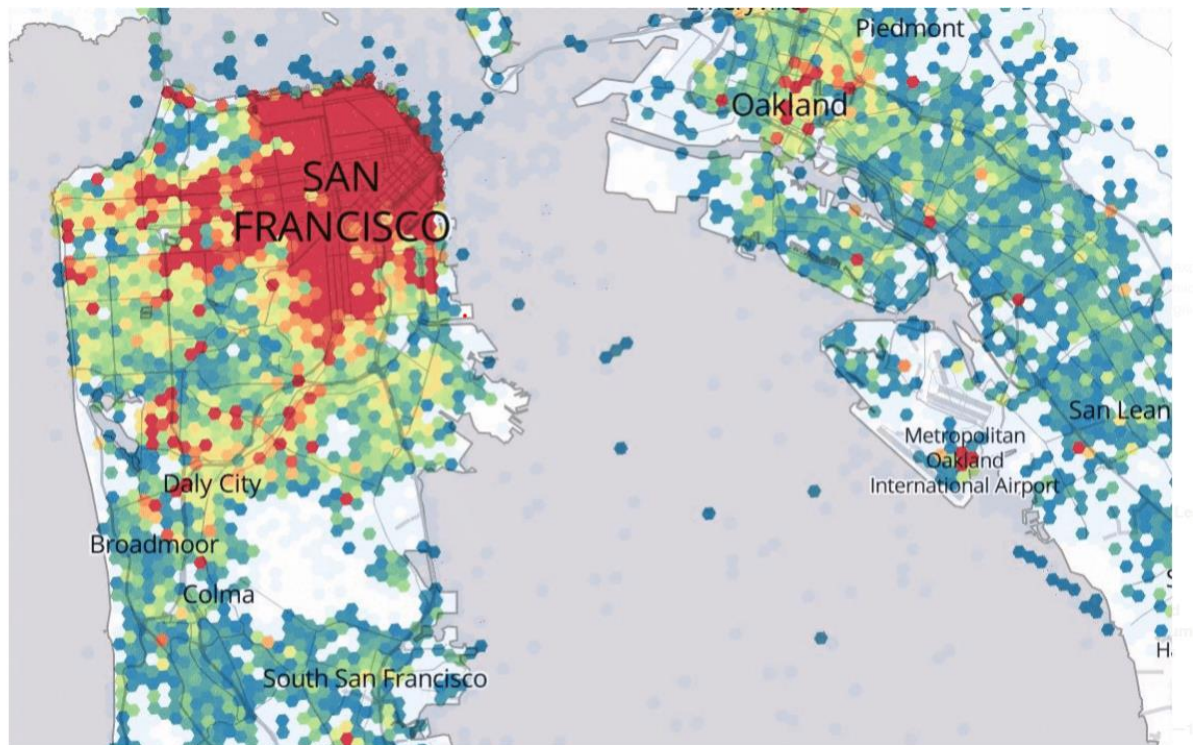
To accomplish this, how we can integrate Artificial Intelligence into fitness is essential to support customers to improve their physical health and mental conditions. In addition, to wellness is crucial in terms of solely focusing on good health that requires the act of practicing healthy habits, to provide protection, safety, and happiness of individuals and others. For instance, AI can be applied in social media applications on smart phone devices. If the fitness company ensures that every customer must afford their own smart phones, mobile data plus phone wrist bands. According to Robinson (2), he discusses about Uber’s functionality of how artificial intelligence can provide customer service under time conditions and improve efficiency. Using the right Data Science tools and Machine Learning to help find better solutions for users and aid customers’ service. Thus, we can be able to take inspiration and understand Uber’s functionalities to build our fitness wrist-based tracking devices on smart devices. Recalling from (1, Unit 5, p.2) Expert Systems, defined that (1, Unit 5, p.2) “computer systems can capture knowledge usually held by a person considered an expert in a particular area”. Suppose that we know what our parameters are given from the customer point of view from a (1, Unit 5, p.2) “human expert”. In this case, it relies on their (2) “ML platform” to help create the fundamental stages to develop a successful “AI and ML infrastructure”. Following under the (2) “COTA system” (see F.1.)

## Customer Support



### (‘F.1. COTA System developed for Uber Services’)

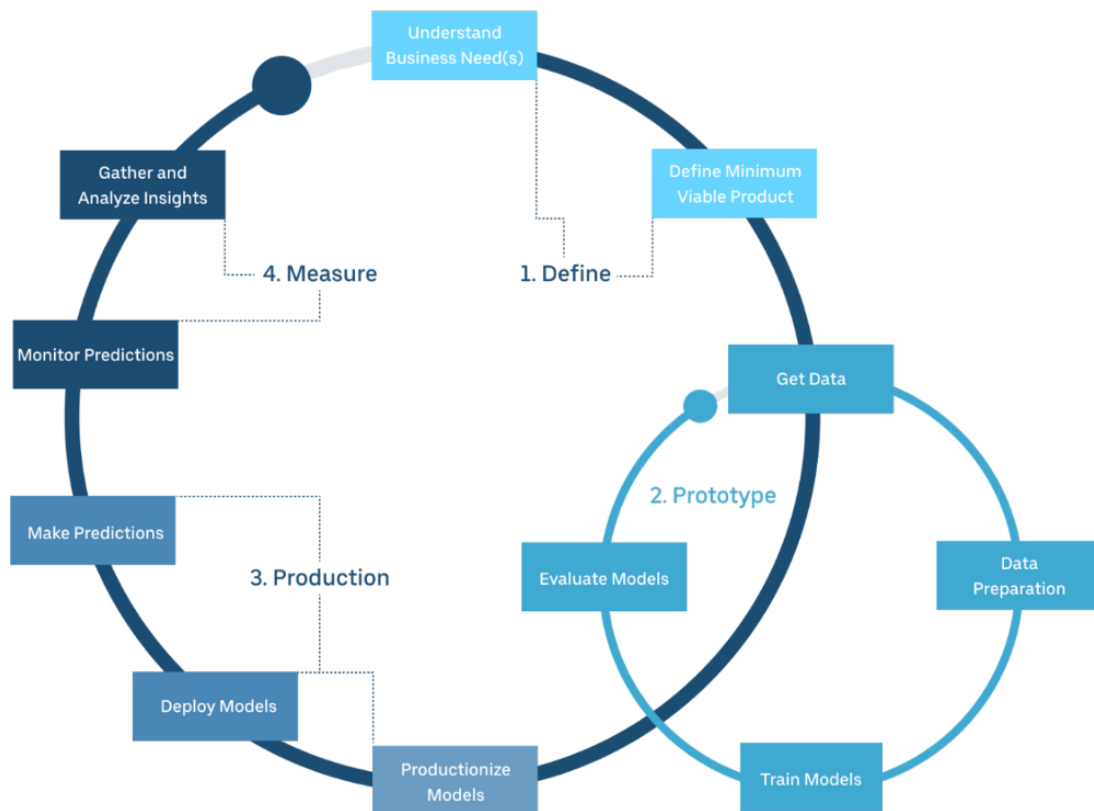
to help increase customer-aid and efficiency. Which follows certain criteria users or (1, Unit 5, p.2) “non-experts to interact via User Interface”. Allowing customers to customise their favourite restaurants, select a destination, buying groceries, pharmacy products, and send their own deliveries in satisfy their fitness goals and impact on their health. After completing each service, it sends customers feedback and service applying (1, Unit 5, p.2) “expert knowledge stored in the knowledge base and returns the result to the user” which helps improve the business and overall efficiency. Finding an appropriate Machine Learning model appropriate for our start-up fitness company is applying (1, Unit 9, p.3) Supervised Learning. To help understand their (1, Unit 9, p.3) “model parameters” considering customer’s names, date of birth, arrival, pickup times (daily) in minutes, steps (auto-pedometer), gender, ratings, and demographics. Applying two supervised Machine Learning tasks using Classification and Regression Models to help identity different types of categories and values respectively. Uber applies Regression models to compute several (2) “predictions to optimize the eater experience”, to follow “each time the app is opened”. Using Time-series Forecasting (see F.2) to help recognise patterns namely (2) “trends, seasonality, competition or pricing” on (2) “time-dependant data”. This heavily relies on (2) “sales, weekly trip counts, app traffic, economic conditions”.



### ('F.2. Uber's Forecasting Model on San Francisco')

Despite this, we must consider applying an artificial neural network accounting customers details within their specific current location where people do the exercise. Alongside with the data of information each time the customer finalises an order, we can visualise that connects each node of choice is interconnected to one another. To consider bonuses, adding new items to the menu, promotions, discounts or simply ignoring these options until the delivery is served to the customer. Shortly after the delivery drops the order to the customers destination within time constraints and distance taken once it achieves that certain goal then the customer is then rewarded after exercise. The application allows them to rate the delivery, service, feedback, tips or simply ignoring these options to finally completing the service. Uber is built of from their advanced ML model (2) "Michelangelo" which is the combination of many (2) "open-source systems and components" including (2) "HDFS, Spark, Samza, Cassandra, MLlib, XGBoost, and TensorFlow". In terms of their rule-based systems, it iterates under the (2) "standard workflow" consisting six steps, is to (2) "Manage Data, Train Models, Evaluate Models, Deploy Models, Make Predictions and Monitor Predictions" (see F.3.). Until the results are fully finalised and optimised to satisfy Ubers business model, to complete the project. Hence, using this Machine Learning tool can help increase our revenue for the fitness company model and produce more wrists band tracking devices to help

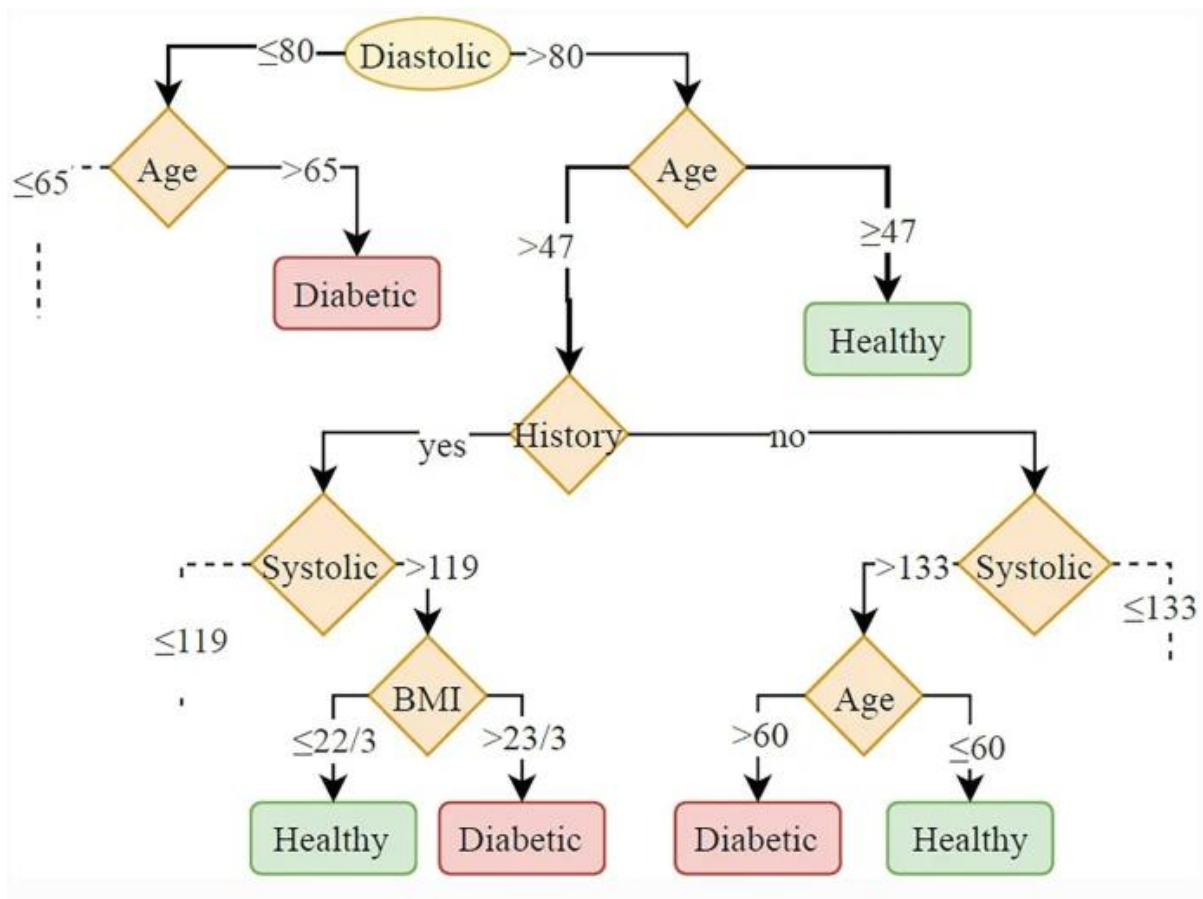
customers make healthier decisions.



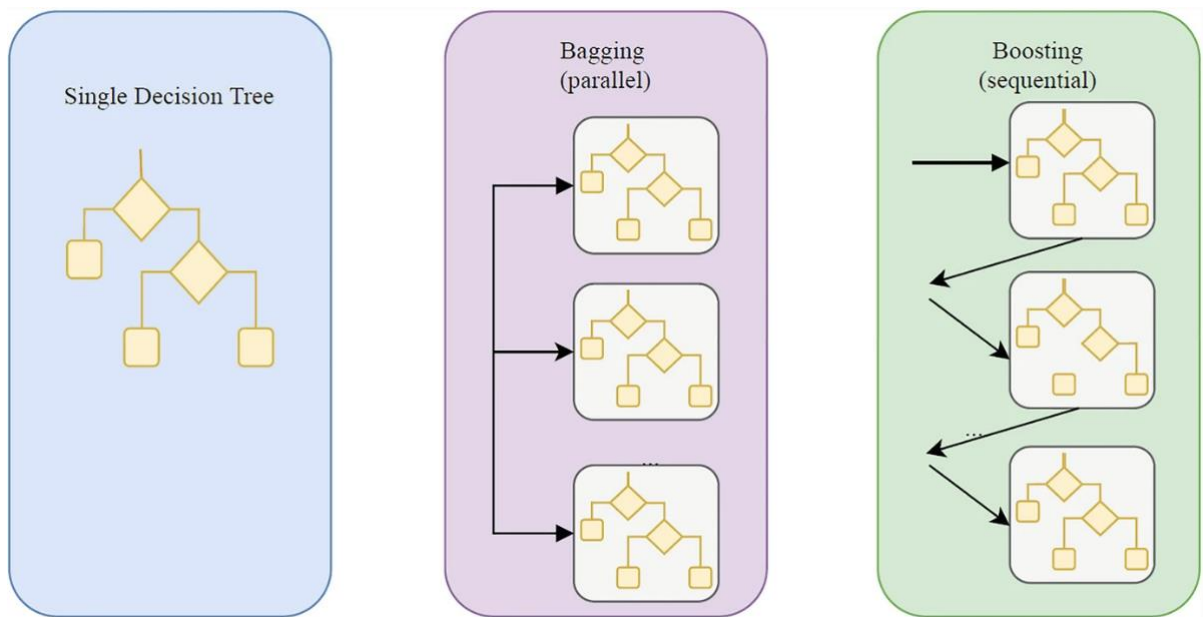
### (‘F.3. Uber’s Machine Learning Project Workflow’)

On the other hand, Artificial Intelligence can aid-customer well-being and fitness, can be applied in health systems and hospitals for (3) “Chronic Clinical Condition”. To (3) “predict and prevent disease states” to (3) “decrease mortality rates and decrease hospital stays”. In this case, we must be careful since we need to configure (3) “real-time monitoring of patients” in (3) “Intensive Care Unit environment” (ICU). To determine if the customer can survive or function due to their prior medical or physical condition would take extra care when necessary. Therefore, the customer is ineligible for the use for the fitness wrist-based app to ensure we need to allow the app to build further documentation before purchasing the product. Furthermore, applying Expert Systems in healthcare (3) “was created for Diabetes patients to provide decision support for insulin”. Requires large volume of data which contribute the overall population. Applying (3) “Big Data” and (3) “Machine learning methodologies” using Supervised learning to predict whether a (3) “patient has disease or not”. Given the model parameters for clinical patients including their names, height, blood pressure, weight, and gender to avoid heteroskedasticity. To use Classification and Regression Models to classify whether the (3) “patient survives or not” and to predict the (3) “heart rate of a patient” respectively. Using their method of advanced data visualisation tools using (3) “Python tsfresh software toolkit”, to predict (3) “both trends in individual physiological variables” to attain the patient’s condition of likely contacting a contagious disease. Applying Time Series helps (3) “remove noise in the data and produce smooth signals” to observe the (3) “patient’s tidal volume profile”.

Despite this, another method done in Machine Learning is to apply decision trees which enables to construct ensemble methods (see F.5.) to perform solutions to (3) “aid in lung protective ventilation” to prevent large volume of at least (3) “8 ml per kg of ideal body weight”. Alternatively, this can be done for Neural Networks (3) “represented as a set of interconnected nodes, connected by neurons” (see F.6.). Consists of (3) “hidden layers” between the input and output layers known (3) “described as Deep Learning” to compute their errors within each node in terms of their values and connections. (see F.4.)

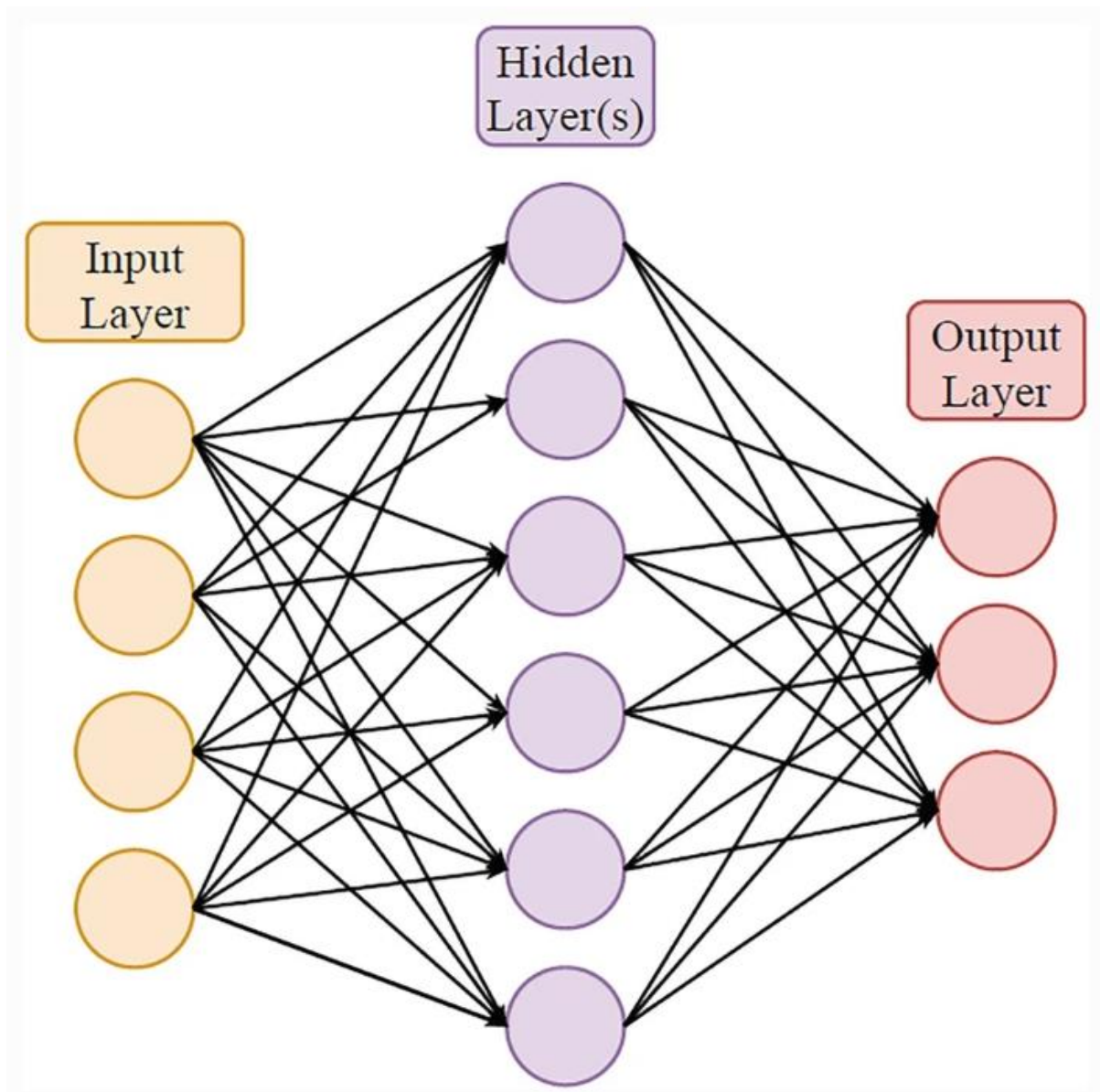


(‘F.4. Decision tree for the classification of diabetes’)



**(‘F.5. Ensemble Methods’)**





(‘F.6. Neural network structure’)

This can provide and increase awareness to many patients to (3) “reduce stress levels, hospital costs”, “pandemic response”, “disease prevention”, “diagnosis decision support “and (3) “prevent lung injury”. Thanks to Big Data which requires reducing unlabelled data, parameters, interference, and its volume to process its efficiency in model predictions.

Regarding to the positives and negatives of different methods of rules-based systems and machine learning. Although many customers may face difficulties when dealing both applications from their user-interface, interpret their functionalities and understanding when it comes to their communication with technology. Depends how advantageous customers, individuals or certain communities can easily adapt to new software within their environment as AI and technology evolves. In conclusion, Robinson's research in Applying AI with Uber primary focuses on the functionality of their AI and ML platform Michelangelo in detail using simple reflex agents. However, the AI applied for healthcare is using Python to create data visualisation and analytics to aid patients reduce diseases, infection, and cure lung ventilation. This follows similar functionalities in terms of Machine Learning tools and software. Overall, they are both acceptable to terms of the artificial intelligence technology can be useful. Fulfills the purpose of what an Artificial Intelligence does to achieve complicated tasks, following a set of algorithms or instructions a human cannot do to achieve this. I believe they are both excellent examples and ideas to how AI can help aid customers decision in their fitness and wellbeing. To attain many customers to benefit their user experience of wrist-based tracking devices to help business and fitness models grow in the future.

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