**Panacea Project Synopsis Report**

**Group No.:** 1

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**Introduction to the project:** Panacea means a solution or remedy for all difficulties or diseases. Our project aims to enhance the existing healthcare system and help in solving post recovery side effects and symptoms helping the medical professionals to help cure patients' symptoms faster.We aim to work using Machine Learning and Graph Database using Python and Neo4j.

**Problem Statement:** Decisions are often made based on doctors’ intuition and experience rather than on the knowledge rich data hidden in the data set and databases. Machine Learning holds a great potential for the healthcare industry to enable health systems to systematically use data and analytics to identify inefficiencies and best practices that improve care. Some diseases can be managed effectively with a combination of lifestyle changes, medicine and, in some cases, surgery if the disease could be predicted beforehand. The predicted results can be used to prevent and thus reduce cost for surgical treatment and other expenses in the future.

**Motivation:** One of the biggest issues of unclean data is that it impacts patient safety. One patient will receive inaccurate and even dangerous treatment because they are being treated based on an entirely different patient's medical record.

**Purpose of the project:** Our goal is to use Machine Learning in order to create an accurate model which can predict the future symptoms/diseases a person might encounter in future with a higher accuracy and confidence score

**Project Scope:** Integration of clinical decision support with computer-based patient records could reduce medical errors, enhance patient safety, decrease unwanted practice variation, and improve patient outcome. This suggestion is promising as data modelling and analysis tools, e.g., data mining, have the potential to generate a knowledge-rich environment which can help to significantly improve the quality of clinical decisions

**Project Objectives:**

1. Integrate multiple datasets (RxNorm, MED-RT, SemMedDB, MeSH, etc) that specify relationships among UMLS concepts to build a knowledge graph.
2. Using machine learning algorithms on this dataset to yield more accurate output.
3. Create a highly accurate system for medicinal practitioners and general public as well to provide better healthcare service and prevent deaths.

**Plan of action to complete the project:**

1. Gain a general understanding of what each dataset is.
2. Use documentation and the data from each dataset to develop a data model that specifies how each dataset connects to the UMLS.
3. Import the UMLS concepts as nodes into a graph.
4. Import each of the other databases to create relationships among UMLS concepts in the graph.
5. Test various graph visualization tools to display the knowledge graph in the most convenient way for clinicians.

**Impact:**

* AI increases the ability for healthcare professionals to better understand the day-to-day patterns and needs of the people they care for, and with that understanding they are able to provide better feedback, guidance and support for staying healthy.
* AI can lead to better care outcomes and improve the productivity and efficiency of care delivery. It can also improve the day-to-day life of healthcare practitioners, letting them spend more time looking after patients and in so doing, raise staff morale and improve retention.

**References:**

* World Health Organization
* Centres for Disease Control and Prevention
* Heart Disease Prediction System, 2019/03/08 Ngare, Kennedy