Unit 2: Research Questions, the Literature Review and the Research Proposal

Task:

Start planning your literature review based on your chosen topic from the list provided in unit 1. Your outline of the literature review can be submitted for formative feedback in unit 4 before final submission in unit 7. You can use the guidance document for the outline submission, and to prepare your review.

You should also take some time to consider your research proposal which could be based around the area you have chosen to investigate in your literature review or the topic of your capstone project (MSc students). Your outline of the proposal can be submitted for formative feedback in unit 8 before final submission in unit 10. Units 8 and 9 will be focussed on analysing data which, along with research methods, will also need to be considered in your presentation.

Answers:

Research Objective:

To evaluate the performance of specific ML techniques in diagnosing diabetes, assess the types of data sources and pre-processing methods used, and identify key challenges and future directions for improving ML-based diagnostic models

Research Questions:

RQ1: What are the key ML techniques applied in diabetes diagnosis?

RQ2: How do data pre-processing methods and data quality affect the performance of ML diagnostic models?

RQ3: What challenges and limitations arise in the adoption of ML in clinical diabetes diagnostics?

RQ4: What are the success factors and best practices from case studies on ML-based diabetes diagnosis?

RQ5: How can future advancements in ML improve diabetes diagnostics?

Literature Source Selection and Inclusion Criteria:

Sources were identified through a systematic search of academic databases, including PubMed, IEEE Xplore, and Google Scholar. Keywords such as "machine learning," "diabetes diagnosis," "supervised learning," "deep learning," and "wearable devices" were used.

Only peer-reviewed journal articles, conference papers, and reviews published between 2020 and 2024 were included. Emphasis was placed on high-impact studies that provide novel insights or address significant challenges.