LONDON METROPOLITAN UNIVERSITY

Islington college
(इस्लिङ्टन कलेज)

Module Code & Module Title

FC7P01NI MSc Project

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Word Count (Where Required):

I confirm that I understand my coursework needs to be submitted online via Google Classroom under the relevant module page before the deadline in order for my assignment to be accepted and marked. I am fully aware that late submissions will be treated as non-submission and a mark of zero will be awarded.

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1. Introduction:

Maternal mortality continues to be a significant global health issue, especially in developing nations such as Nepal. Not only is maternal mortality prevalent in many communities but it also leads to sizeable issues at the family and societal level for economies such as Nepal which are grappling to become developed nations In doing so it becomes even more problematic as it is an undesirable cycle that states that, comprehensive healthcare inadequacies ameliorating the maternal discrimination, economic hierarchies. Furthermore, even the slightest affection for improvement in the state of the existing conditions is not showcased as it can be seen in the finer details of the data in comparison to other MMR rates across the globe.

While the factors attributed to the issue are numerous, the incorporation and commencement in the usage of machine learning can aid in ameliorating the condition. At the core of the decision-making criteria, the suitable allocation of resources and proficient recognition of susceptible aspects such as economic hierarchies are deemed as the core of the solution. Using the ML techniques, your public health problems in Nepal can be intertwined with technological solutions.

2. Dissertation Aim and Objectives

Aim: By evaluating maternal mortality in Nepal, identifying critical risk factors, and predicting high-risk scenarios, machine learning techniques will help direct targeted medical interventions.

Objectives:

- To guarantee consistency and quality, gather and preprocess Nepalese maternal health data.
- To find trends, patterns, and connections in maternal mortality, conduct exploratory data analysis (EDA).
- Utilize machine learning algorithms to create prediction models.
- Utilize metrics like accuracy, precision, and recall to assess the model's performance.
- Analyze results to make practical suggestions for lowering Nepal's maternal death rate.

3. Motivational Background:

Maternal health serves as an essential indicator of a country's socioeconomic progress and general healthcare framework. The rates of maternal mortality in rural and disadvantaged regions are especially significant to my personal and professional aspirations as a citizen of Nepal. The objective of this dissertation is to apply machine learning and data science to address real-world issues. By merging my passion for public health with my skills in machine learning, I aim to assist Nepal in achieving Sustainable Development Goal 3: ensuring healthy lives and promoting well-being for everyone.

4. Research Questions

- What are the key socio-economic, demographic, and healthcare-related factors contributing to maternal mortality in Nepal?
- How can machine learning models be utilized to predict high-risk maternal cases effectively?

5. Literature Review

5.1 Maternal Mortality: Global and Nepal Context

1. Global Trends in Maternal Mortality:
    - Outline worldwide patterns in maternal mortality rates, highlighting key factors such as insufficient healthcare systems, socio-economic inequalities, and limited access to emergency obstetric services.
    - Consult WHO reports, Sustainable Development Goals (SDG 3.1), and international strategies aimed at decreasing maternal mortality.
2. Maternal Mortality in Nepal:

- Examine the maternal mortality ratio (MMR) in Nepal and contrast it with that of adjacent countries.
- Emphasize major elements affecting maternal mortality in Nepal, including poverty, lack of education, gender disparities, and insufficiently skilled birth attendants.
- Incorporate information from Nepal's Demographic and Health Surveys (NDHS), official reports, and scholarly research for statistical backing.

5.2 Risk Factors and Determinants of Maternal Mortality

1. Socio-Economic Determinants:
    - Investigate the impact of socioeconomic elements such as income, education, and the gap between rural and urban areas on maternal mortality.
    - Reference research that connects these variables to postponed access to prenatal and urgent medical assistance.
2. Healthcare Access and Quality:

- Examine how the presence of qualified healthcare workers, transportation options, and the quality of facilities affect maternal health results.
- Incorporate studies on obstacles encountered by women in rural Nepal, including insufficient transportation and traditional customs.

3. Other Factors:

- Consider biological factors like the age of the mother, the number of prior births, and any current medical conditions (e.g., hypertension or anemia).
- Provide studies on the effects of cultural norms, family planning, and nutrition on mother's health.

6. Methodology Selection:

Research Methodology: The purpose of evaluating numerical data and creating prediction models is in line with a quantitative research approach that will be used.

• Information Gathering: Gather information on maternal health in Nepal from government databases, medical records, and surveys like the Demographic and Health Survey (DHS).

• Data preprocessing: Encode categorical variables for machine learning models, handle missing values, and standardize data.

• Data Analysis: To comprehend trends in maternal mortality, use exploratory data analysis (EDA) methodologies.

• Machine Learning Models: To forecast high-risk maternal cases, train models such as logistic regression, decision trees, and neural networks.

7. Project plan (Gantt chart)

Task	Dec 2024	Jan 2025	Feb 2025	Mar 2025	Apr 2025	May 2025
Define research scope	✓					
Literature review	✓	✓				
Data collection		✓	✓			
Data preprocessing			✓	✓		
Exploratory Data Analysis (EDA)			✓	✓		
Model development				✓	✓	
Model evaluation and validation					✓	
Writing dissertation draft				✓	✓	
Checking and final edits				✓	✓	✓
Submission						**✓ May 23 2025**