**MSc in Software Design with Artificial Intelligence**

**Initial Project Concept**

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| **Student Name:** | **Simon McLain** |
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| **Project Title:** | **Predicting risks to COVID bed capacity in Acute Hospitals due to seasonal public gatherings and large social events** |
| **Project Background:** | * **To avoid collapse of the healthcare system and implement appropriate public health advice it is necessary for NPHET to be able to predict the bed capacity for each acute hospital to admit COVID inpatients.** * **When creating public health advice policy makers need to fully grasp the future strain on bed capacity each acute hospital may experience.** * **As we enter a new phase of the pandemic, with the opening of society to increased numbers at public social and seasonal events, there is a risk of increased covid hospitalisations exceeding the covid bed capacity.** * **The ability to predict a super spreader event will be paramount to health service officials in resource planning.** * **Results will be somewhat limited because not every individual attending an event will be willing to be PCR tested when presenting with symptoms.** * **Modern Irelands health service does not have experience in managing pandemics.** * **Where demand for PCR testing exceeds supply it may not be possible to accurately predict the actual prevalence of covid in a population.** |
| **Project Challenge:** | * **Predict how many people will get COVID at a specified future date due to large social or seasonal gatherings.** * **Forecast the number of people that will require hospital treatment.** * **Compare the predicted covid hospitalisations to the available covid beds to determine the bed capacity.** |

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| **Proposed Approach:** | * **Using Python to create, evaluate and select the most appropriate machine learning algorithm. Including but not limited to Deep Neural Networks, Naïve Bayes, and Decision Tree etc.** * **Conduct a literature review of machine learning models used to predict super spreader events.** * **Gather data for Irelands past confirmed COVID cases, including historical COVID hospitalisations.** * **Gather data on the attendance of large past and future social events and gatherings.** * **Collect data for the available covid beds in each hospital.** |