Assignment No:

A) Need for analysis of algorithms to be done.

Analysis of an algorithm means a prediction of how fast the algorithm works based on the problem size. It is necessary to analyze an algorithm so that, if we have n number of algorithms then the fastest and one with less time and space complexity can be selected. This will ensure maximum utilization of the available resources. Time complexity deals with the amount of time will be required for the algorithm to execute the required for the algorithm to execute the required function. Space complexity deals with the memory requirement of the algorithm

Informally, an algorithm is any well-defined computational procedure that takes some values or set of values, as input and produces some values, or set of values as output. An algorithm is thus a sequence of computational steps that transforms the input into the output. To analyze an algorithm is to determine the amount of resources (such as time and storage) necessary to execute it.

In order to choose the best algorithm for a particular task, we need to be able to judge how long a particular solution to take to run. Or, more accurately, we need to be able to judge how long two solutions will take to run and choose the better of the two. We don't need to know how many minutes and seconds they will take, but we do need some way to compare algorithms against one another. This is why we need to analyze an algorithm.

B)Project problem statement, feasibility assessments using NP-hard, NP-Complete or satisfialbility issues.

Problem Statement:

To create a real-time machine learning model to predict the risks in disease occurrence and growth of diseases affected by climate and to plan the daily routine accordingly based on the weather forecast.

Algorithm Strategies:

An algorithm is a well-defined sequence of steps used to solve a well-defined problem in finite time. An algorithm must solve all instances of the problem for which it was designed and thus is said to be correct. The running time of an algorithm is the number of instructions it executes when run on a particular instance.

There are number of well-known algorithm strategies:

- Recursive algorithms
- Backtracking algorithms
- Branch and bound algorithms
- Divide and conquer algorithms
- Dynamic programming algorithms
- Greedy algorithms
- Brute force algorithms

Feasibility assessment using NP-Hard, NP-complete.

P:

P is a complexity class that represents the set of all decision problems that can be solved in polynomial time. That is, given an instance of the problem, the answer yes or no can be decided in polynomial time.

Our problem statement is P.

NP:

NP is a complexity class that represents the set of all decision problems for which the instances where the answer is “yes” have proofs that can be verified in polynomial time. This means that ifsomeone gives us an instance of the problem and a certificate (sometimes called the witness.) to the answer being yes, we can check that it is correct in polynomial time.

NP-HARD:

Intuitively, these are the problems that are even harder than the NP-complete problems. Note that NP-Hard problems do not have to be in NP, and they do not have to be decision problems. The precise definition here is that a problem X is NP-hard, if there is an NP-complete problems Y, such that Y is reducible to X in polynomial time.

But, since any NP-complete problem can be reduced to any other NP-complete problem in polynomial time, all NP-complete problems can be reduced to any NP-hard problem in polynomial time. Then, if there is a solution for one NP-Hard problem in polynomial time, there is a solution to all NP problems in polynomial time.

Feasibility Assessment:

The purpose of a feasibility study is to identify the likelihood of one or more solutions meeting the stated business requirements. In other words, if you are unsure whether your solution will deliver the outcome you want, then a project feasibility study will help gain the clarity. During the feasibility study, a variety of “assessment” solutions are implemented.

Technical Feasibility:

The system will be developed using python ANN models (pybrain, keras) and android development kit. The database will be a realtime free-base database with JSON structure.

Schedule feasibility:

The project can be successfully completed in the given time frame of eight months.

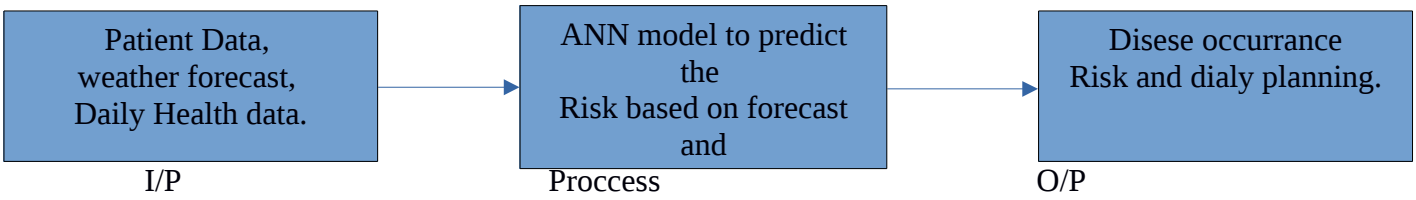
Legal feasibility:

Our project is an in-house project implemented at the college level. So, there will be no legal problems.

Financial feasibility:

All the project is developed using freely available resources and libraries as well an free real time connection to the database so it does need any sort of financial support.

C) Use Modern Algebra AND/OR Relevant mathematical models for different modules of the project.



S = {I, O, F, Sc, Fc}

I = {I1, I2, I3}

I1= Pateint Datasets for model training.

I2= User Daily Health data.

I3= Weather forecast.

O= {O1, O2}

O1= Risk prediction of the disease.

O2= Daily planning.

F= {F1}

F1= Artificial Neural Network to analyze and predict the risk of disease occurrence based on the weather forecast.

Success if:
1. Proper training database based on the conditions and climate.
2. Correct details entered by the user.
3. Accuracy of weather forecast maximum.
4. Proper ANN Model development.

Failure if:
1. Improper Training Database based on the conditions.
2. Incorrect details entered by the User.
3.Accuracy of weather forecast minimum.4. Improper ANN Model development.