**Nithin Das, CWID: 10422784, Date: 11/7/19 Assignment W&A 4th Edition, Ch 7, Q 70**

I pledge on my honor that I have not given or received any unauthorized assistance on this

assignment/examination. I further pledge that I have not copied any material from a book, article,

the Internet or any other source except where I have expressly cited the source.

Signature: NITHIN DAS

Date: 11/7/2019

**Management Overview**

* **Problem Statement**

(i)To use Non-Linear Programming to minimize the average time taken by any traveler to travel from New Jersey to New York City .

(ii) To use Non-Linear Programming to decide number of people who can drive from New Jersey to New York City such that the time taken by both train travelers and individual vehicle are the same.

* **Data Sources**

**Input**: Time taken by the train to reach New York City

**Decision variables**: Number of people who drives from New jersey to New York

**Constraints**: Total number of People should be 10000

* **Model Approach**
* Enter all the inputs in the spreadsheet
* Identify the changing cells and constraints for the model
* Enter random values for ‘Number of people who drive’ field, as this is the changing cell**.**
* Calculate ‘Total People’ as the sum of People driving and people travelling by train.
* Calculate ‘Time taken by drive’ field as 20 + (5\* Number of people who drive)
* Use Solver to add objective function as Time taken by drive =40
* **Solution**

Results:

Part (a)

1. The number of people who drive from New Jersey to New York City should be 4000 so that the average time taken by the train equals the time taken by drive.

Part (b)

2. The average time taken by any traveler is minimized (38 min) if number of people driving from New Jersey to New York City =2000 daily