**Activity 2.5.4 – Historic Hotels**

You and your team work as financial consultants. Your primary function is to provide clients financial advice. You have a client who just inherited a historic hotel in Boston, Massachusetts. Your client’s situation is described below.

Ms. Amanda Graham has just inherited a historic hotel. She would like to keep the hotel but she has little experience in hotel management. The hotel has 80 rooms. The previous owner told Ms. Graham that all of the rooms are occupied when the daily rate is $180 per room. The previous owner also stated that the number of occupied rooms depends on the daily rate. For every 5$ increase in the daily rate, one fewer room is occupied. Also, there is a $4 daily cost for maintaining and servicing each occupied room.

Ms. Graham would like to know what the daily rate should be in order to maximize the daily profit.

**Assignment**

* Formulate a mathematical model to solve this problem
* State the model’s assumptions
* Determine the daily rate that will maximize her daily profit
* Justify the solution using a table or graph
* Discuss the model’s limitations