Final Exam Project

Due Dec 21 by 11:59pm   **Points** 50   **Submitting** a file upload

The final project is based on the case study, Chapter 12.6 pp. 473-474. You will each get your own individual dataset which will be posted to Canvas.

I. The Problem Statement

The vice president of a rapidly growing information systems company has given you the task to analyze the commercial rental market for relocation to a Midwestern city in the US. At your first meeting, the problem is described as follows:

"We're planning to relocate to the Midwest, and we're committed to one particular city. We've gotten information on office rental costs for 225 new rentals in that city during the last two years. The market there is pretty flat, so the numbers should reflect the present situation. We're at the wish list stage right now, and we are not yet in a hurry. We can wait for a bargain, but how do we know what is a bargain in that market? We know lots about computer networks, but almost nothing about commercial real estate. Obviously, square footage is going to be the primary driver of rental cost, but we don't know how to price other things. For example, how much can we save by going to a longer lease? How does location and age of the building factor into the cost? Clearly we cannot pinpoint costs down to the last dollar, but there is information in the data. Your task is to provide some cost ranges on the various features of the space that we may want to lease. Our rental needs are 50,000 square feet of office space in good repair and with modern wiring. We tend towards a short term lease as a precaution because we may not want to lock ourselves into an unknown facility and area from the start. Of course we would prefer a desirable location, but we don't know what the financial trade-offs are. We hope your analysis will provide us with a model that allows us to play scenarios and to judge the asking rent of new properties that come on the market. We would like to know a bargain when we see one."

II. The Data

Some background on commercial real estate: Figuring actual cost of rental is not entirely straight forward. When asked, a property owner or realtor may quote what is called "usable square feet", an annual rental price per square foot, and a "common area factor".

"Usable square feet" is the amount of space the lease holder actually gets to use. A "common area factor" such as 15% indicates by how much the "usable square feet" have to be increased to obtain the "rentable square feet" on which the lease holder actually pays rent. The initial quote of rent per square foot will only refer to the first year of the lease, and scheduled yearly increases will be part of the

contract. Also, the initial quote will not include operating costs, for example, $7.50 per square foot per year, plus yearly increases thereof, to be specified in the contract. Finally, parking may cost, for example, $1300 per space and month in the city, but be free in the suburb.

To cut through this complexity, we report SqftLease as "usable square feet", which is what the firm is interested in. The variable RentTotal has been compiled as total annual cost of rentable square feet, including operating expenses as far as they can be projected. That is, we added up all annual costs connected with rental, which is again what the firm is interested in (we glossed over the problem of rent increases, though). We assumed that employees will have either free parking in the suburb or use public transportation to commute to the city center. However, the rent may include a small number of executive parking spaces in the lease; their contribution to rental cost is not clear a priori and has to be estimated from the data.

The data has information for 225 recently leased properties as described in the table below.

VARIABLE NAME	DESCRIPTION
RentTotal	Total annual rent of the lease
SqftLease	Size of the lease in square feet
FirmType	Majority type of firms in the building (doctors, legal, business, government, other)
Age	Age of the building in years
Renovation	Number of years since last renovation
Wiring	Yes, if building has new wiring
Occupancy	Fraction of offices that are rented
Leaselength	Length of the lease in years
Renewable	Yes, if the lease is renewable
Location	One of three locations: center of city, old/new suburb

DistCity	Distance to the center of the city center in miles
DistAirp	Distance to the airport in miles
DriveAirp	Distance to the airport in driving time
DistHosp	Distance to nearest hospital in miles
FloorLease	The (lowest) floor where the lease is located
FloorsBldg	Number of floors in the building
SqftFloor	Size of a floor in square feet
Elevator	Number of elevators
Parking	Number of executive parking spaces included in rental
Restaurant	Yes, if the building has a restaurant
Exercise	Yes, if building has a health club

III. Deliverables

After completing your technical analysis, write a report presenting your findings. It should consist of two parts:

1. Part one should be an executive summary written in non-technical language, **not to exceed one page.** It should present your results for the vice president, free of statistical jargon, graphs and charts.
2. Part two should be a technical summary written for the statistical expert. **This part should not exceed three pages, including all pertinent JMP output.** This part should contain sufficient detail to convince the statistical expert that you have performed a competent analysis of the data.