

### **Problem -1 (20 points)**

#### **Cereal Data Factor Analysis**

The data file labeled Cereal has the following information

As part of a study of consumer consideration of ready-to-eat cereals sponsored by Kellogg Australia, Roberts and Lattin (1991) surveyed consumers regarding their perceptions of their favorite brands of cereals. Each respondent was asked to evaluate three preferred brands on each of 25 different attributes. Respondents used a five point likert scale to indicate the extent to which each brand possessed the given attribute.

For the purpose of this assignment, a subset of the data collected by Roberts and Lattin, reflecting the evaluations of the 12 most frequently cited cereal brands in the sample (in the original study, a total of 40 different brands were evaluated by 121 respondents, but the majority of brands were rated by only a small number of consumers). The 25 attributes and 12 brands are listed below

Cereal Brand	Attributes 1-12	Attributes 13-25
All Bran	Filling	Family
Cerola Muesli	Natural	Calories
Just Right	Fibre	Plain
Kellogg's corn flakes	Sweet	Crisp
Komplete	Easy	Regular
Nutrigrain	Salt	Sugar
Purina Muesli	Satisfying	Fruit
Rice Bubbles	Energy	Process
Special K	Fun	Quality
Sustain	Kids	Treat
Vitabrit	Soggy	Boring
Weetbix	Economical	Nutritious
	Health	

In total 116 respondents provided 235 observations of the 12 selected brands. How do you characterize the consideration behavior of the 12 selected brands? Analyze and interpret your results using factor analysis.

## **Problem 2 (10 points)**

### **Leslie Salt Data Set**

In 1968, the city of Mountain View, California, began the necessary legal proceedings to acquire a parcel of land owned by the Leslie Sal Company. The Leslie property contained 246.8 acres and was located right on the San Francisco Bay. The land had been used for salt evaporation and had an elevation of exactly sea level. However, the property was diked so that the waters from the bay park were kept out. The city of Mountain View intended to fill the property and use it for a city park.

Ultimately, it fell into the courts to determine a fair market value for the property. Appraisers were hired, but what made the processes difficult was that there were few sales of byland property and none of them corresponded exactly to the characteristics of the Leslie property. The experts involved decided to build a regression model to better understand the factors that might influence market valuation. They collected data on 31 byland properties that were sold during the previous 10 years. In addition to the transaction price for each property, they collected data oina large number of other factors, including size, time of sale, elevation, location, and access to sewers. A listing of these data, including only those variables deemed relevant for this exercise. A description of the variables is provided below.

Variable name	Description
Price	Sales price in \$000 per acre
County	San Mateo=0, Santa Clara =1
Size	Size of the property in acres
Elevation	Average Elevation in foot above sea level
Sewer	Distance (in feet) to nearest sewer connection
Date	Date of sale counting backward from current time (in months)
Flood	Subject to flooding by tidal action =1; otherwise =0
Distance	Distance in miles from Leslie Property (in almost all cases, this is toward San Francisco

Discuss and Answer the following questions:

1. What is the nature of each of the variables? Which variable is dependent variable and what are the independent variables in the model?
2. Check whether the variables require any transformation individually
3. Set up a regression equation, run the model and discuss your results

**Problem 3 (10 points)**

**All Greens Franchise**

Explain the importance of X2, X3, X4, X5, X6 on Annual Net Sales, X1.

The data (X1, X2, X3, X4, X5, X6) are for each franchise store.

X1 = annual net sales/\$1000

X2 = number sq. ft./1000

X3 = inventory/\$1000

X4 = amount spent on advertising/\$1000

X5 = size of sales district/1000 families

X6 = number of competing stores in district