Assignment 1

1) (**22 points**) Discuss whether or not the following activities are data mining tasks:
   a. Dividing the customers of a company according to their gender
   b. Monitoring the heart rate of a patient for abnormalities
   c. Sorting a student database based on student identification numbers
   d. Associating the relationship between frequently purchased items and preferred customers
   e. Predicting the outcomes of tossing a pair of dice
   f. Predicting the future stock price of a company using historical records
   g. Monitoring seismic waves for earthquake activities
   h. Extracting the frequencies of a sound wave
   i. Computing the total sales of a company
   j. Using regression formula to predict the student's potential at admission office
   k. Dividing the customers of a company according to their profitability

2) (**12 points**) Distinguish between noise and outliers by answering the following questions:
   a. Is noise ever interesting or desirable?
   b. Is outlier ever interesting or desirable?
   c. Can noise objects be outliers?
   d. Are noise objects always outliers?
   e. Are outliers always noise objects?
   f. Can noise make a typical value into an unusual one, or vice versa?

3) (**16 points**) Classify the following attributes as binary, discrete, or continuous. Also, classify them as qualitative (normal or ordinal) or quantitative (interval or ratio). For example, age in years. Answers should be discrete, quantitative, and a ratio.
   a. Time in terms of a.m. or p.m.
   b. Brightness as measured by a light meter
   c. Brightness as measure by people's own judgment, such as bright, dim, dark
   d. Angles as measured in degrees between 0 and 360
   e. Olympics medals, such as bronze, silver, and gold
   f. Height above sea level
   g. ISBN of book
   h. Military rank

4) (**10 points**) Construct a data cube for the attached table

Product ID	Time, Quarters	Revenue, $
1	1	900
1	2	1200
1	4	3200
2	1	1230
2	3	3400
3	1	2010
3	2	190
3	3	900
3	4	740
4	2	3160
4	3	2170
4	4	500

    a. What is the most profitable quarter?
    b. What is the most profitable product?