**LSP 121 Practice Problems**

**Databases**

Create a database for the DePaul basketball ticket system. A customer can purchase one or more tickets. You should record the customer’s name, address, etc, and then a list of each ticket that has been sold to this customer (record row number, seat number, date of game, time of game). Finally, create a form that will allow someone to enter and view the records, and a report that lists each customer along with each seat assignment.

**Descriptive Statistics**

Using SPSS (preferably) and the file *IncomeGaps.xls* (which can be found on the *qrc.depaul.edu* website under the tab *Excel Files*), find the mean, median, range, min, max, standard deviation, first quartile, and third quartile for the *Bottom Fifth* column of income data. If you examine just the Bottom Fifth data, is there an outlier? Create the histogram that represents this data.

**Correlation**

Using either Excel or SPSS and given the data set *WineConsumption.xls* (on the *qrc.depaul.edu* website under the tab *Excel Files* under the link *OlderData* at the **bottom** of the page), determine if there is a correlation between the average annual amount of wine consumed and the heart disease death rate.

**Number systems and conversions**

The world’s fastest moving tectonic plate is the Pacific Plate. It moves at the lightning speed of four inches a year. What is that in miles per hour?

What is the decimal value of binary 101101?

What is the binary value of decimal 57?

**Logarithms**

Using an Excel spreadsheet, calculate the data rate in bits per second using Nyquist’s equation (data rate = 2 x frequency x log2(signal levels). Hold the number of signal levels constant at 8 and vary the frequency from 1000 to 10,000 Hz in increments of 500.

**Basic Probability**

What is the probability of a 200-year flood this year?

What is the probability of not rolling a double-6 with two dice?

Suppose event A has a 0.98 probability of occurring and event B has a 0.94 probability of occurring. Compute the *odds* for event A and the *odds* for event B.

What is the probability of the next five births at a hospital all being girls?

Studies have shown that Peoria, Illinois is hit by a tornado about every 30 years. What is the probability that Peoria will be hit by a tornado this year? What is the probability that Peoria will be hit by tornados in three consecutive years? What is the probability that Peoria will be hit by at least one tornado in the next 30 years?

Suppose that license plates are made with three letters followed by three numerals (0-9). How many different license plates are possible?

An insurance policy sells for $500. Based on past data, an average of 1 in 50 policyholders will file a $5000 claim, an average of 1 in 100 policyholders will file a $10,000 claim, and an average of 1 in 200 policyholders will file a $30,000 claim. What is the expected value of a single policy to the insurance company?

**Algorithms**

What are the four basic types of instructions used in computer algorithms/programs?

Using any computer language (or even in English) write an IF statement that performs operation A if MAXVALUE is less than or equal to 500, else performs operation B.

Using any computer language (or even in English) write a loop that performs operations C and D 60 times.