Homework Assignment 1

1. (20 pts) Classify each of the following as either a population (P) or a sample (S):

    a) Pounds of fish caught by all persons in a fishing derby.

    b) Credit card debt of 100 families selected from a city.

    c) Numbers of home runs hit by all players in the major league in 2008.

    d) Losses of 25 investment banks selected at random.

2. (20 pts) Classify the following data as categorical/qualitative (Q), numerical continuous (C), or numerical discrete (D):

    a) Number of persons in a family.

    b) Color of a car.

    c) Marital status.

    d) Distance from New York to Los Angeles.

3. (20 pts) A sample of 26 offshore oil workers took part in a simulated escape exercise, resulting in the accompanying data on time (sec) to complete the escape ("Oxygen Consumption and Ventilation During Escape from an Offshore Platform," *Ergonomics*, 1997: 281–292):

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    389   356   359   363   375   424   325   394   402
    373   373   370   364   366   364   325   339   393
    392   369   374   359   356   403   334   397
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    Construct a stem-and-leaf display of the data. Does the display appear to be reasonably symmetric about a representative value, or would you describe its shape in some other way? Do there appear to be any outlying strength values?

4. (20 pts) The accompanying data set consists of observations on shear strength (lb) of ultrasonic spot welds made on a certain type of alclad sheet. Choose ten equal-width class intervals of length 200 with boundaries 4000, 4200, ..., determine the frequency and relative frequency for each class, include the summary in a table,

and construct a histogram. [The histogram will agree with the one in "Comparison of Properties of Joints Prepared by Ultrasonic Welding and Other Means" (*J. of Aircraft*, 1983: 552–556).]

5434	4948	4521	4570	4990	5702	5241	5112	5015	4659
4806	4637	5670	4381	4820	5043	4886	4599	5288	5299
4848	5378	5260	5055	5828	5218	4859	4780	5027	5008
4609	4772	5133	5095	4618	4848	5089	5518	5333	5164
5342	5069	4755	4925	5001	4803	4951	5679	5256	5207
5621	4918	5138	4786	4500	5461	5049	4974	4592	4173
5296	4965	5170	4740	5173	4568	5653	5078	4900	4968
5248	5245	4723	5275	5419	5205	4452	5227	5555	5388
5498	4681	5076	4774	4931	4493	5309	5582	4308	4823
4417	5364	5640	5069	5188	5764	5273	5042	5189	4986

5. (20 pts) The article "Snow Cover and Temperature Relationships in North America and Eurasia" (*J. Climate and Applied Meteorology*, 1983: 460-469) used statistical techniques to relate the amount of snow cover on each continent to average continental temperature. Data presented there included the following ten observations on October snow cover for Eurasia during the years 1970-1979 (in million km^2):

$$6.5 \quad 12.0 \quad 14.9 \quad 10.0 \quad 10.7 \quad 7.9 \quad 21.9 \quad 12.5 \quad 14.5 \quad 9.2$$

a) (10 pts) Calculate the sample mean $\bar{x}$ and median $\tilde{x}$.

b) (5 pts) By how much could the largest sample observation 21.9 be decreased without affecting the value of the median?

c) (5 pts) Calculate a 20% trimmed mean $\bar{x}_{\mathrm{tr}(20)}$.