**Problem Set 2 (100 points)**

Complete the following problems. In your analysis, assume that all continuous data are normally distributed and the sample is representative and independent.

For each problem, please provide the following steps:

* State the statistical hypotheses;
* State the statistical tests you choose to use. Be specific (how many population, right, left or two-tail, and why do you choose this test);
* State the decision rules;
* Perform the statistical tests in R or by hand;
* Report the results;
* State the statistical decision.

Submit three files on Blackboard: (1) Your solution report in MS Word or PDF document (2) R code (3) Output file as a text document. Please use the naming convention when saving these files. Review the link “How to submit Assignments with R”.

**Problem 1 (24 points)**

Exercise 7.3.7 on page 224 of Daniel & Cross (Lymphocytes vs Tumor Cells).

Perform the appropriate statistical tests and report the results of two different analyses:

1. Assume that the variances of the two groups are equal.
2. Assume that the variances of the two groups are unequal.

Please to go through the steps listed in the above instruction. Data for this problem are provided in the csv file “Problem 1 Data”.

**Problem 2 (24 points)**

Review Questions and Exercises #26 on page 256 of Daniel & Cross (monozygotic twins’ data).

Answer the question in the book by going through the steps listed in the above instruction. Data for this problem are provided in the csv file “Problem 2 Data”.

**Problem 3 (24 points)**

Exercise 7.6.1 on page 236 of Daniel & Cross (current vs former smokers).

Answer the question in the book by going through the steps listed in the above instruction. Use alpha=0.05 instead of 0.01.

**Problem 4 (24 points)**

A study examined the rates of posttraumatic stress disorder (PTSD) in mothers and fathers. Parents were interviewed 5 to 6 weeks after an accident or a new diagnosis of cancer or diabetes mellitus type I for their child. Twenty-eight of the 175 fathers interviewed and 43 of the 180 mothers interviewed met the criteria for PTSD. Is there sufficient evidence to conclude that fathers are less likely to develop PTSD than mothers when a child is traumatized by an accident, cancer diagnosis, or diabetes diagnosis?

Answer this question by going through the steps listed in the above instruction.

**File submission and R program: 4 Points**