ENGR 200 FALL, 2017

**A6: RESERVOIR ANALYSIS**

**(using input/output files, if structures, for loops, one-dimensional and two-dimensional arrays)**

DUE: October 24, 2017 at 11:59 pm, CDT POINTS: 65

**INTRODUCTION:**

Lake Powell is the second largest reservoir in the United States following Lake Mead. It was formed after the completion of the Glen Canyon Dam on the Colorado River. Over an eight-year period (2000-2007) data was collected dealing with the height of the water in the reservoir measured in feet above sea level. The data represents 12 months out of every year. A file called **lake\_powell** contains the months and water levels.

**ASSIGNMENT:**

Write a C program that will read the two control numbers, and then will read the months into a two-dimensional character array, and the heights in feet above sea level into a two-dimensional double array. The program will compute the average water height for the eight-year period. Using one-dimensional arrays, the program will compute the average water height for each year, and the average water height for each month. Also, the program will determine the minimum and maximum water heights for the eight-year period, and how many months for the eight-year period the water level exceeded the eight-year average. The program will incorporate input and output files, if/else structures, two-dimensional arrays, one-dimensional arrays, and for loops.

Your program will print to the computer screen and print to an output file called **lake\_powell\_report**. The output format is given below.

**OUTPUT FORMAT:**

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LAKE POWELL RESERVOIR ANALYSIS

(feet above sea level)

Year

2000 2001 2002 2003 2004 2005 2006 2007 Monthly

Month Average

ccccccccc xxxx.xx xxxx.xx xxxx.xx xxxx.xx xxxx.xx xxxx.xx xxxx.xx xxxx.xx xxxx.xx

. . . . . . . . . .

. . . . . . . . . .

. . . . . . . . . .

ccccccccc xxxx.xx xxxx.xx xxxx.xx xxxx.xx xxxx.xx xxxx.xx xxxx.xx xxxx.xx xxxx.xx

Yearly Average

xxxx.xx xxxx.xx xxxx.xx xxxx.xx xxxx.xx xxxx.xx xxxx.xx xxxx.xx

Reservoir Statistics:

Average water height above sea level is xxxx.xx feet.

Minimum water height above sea level is xxxx.xx feet.

Maximum water height above sea level is xxxx.xx feet.

Number of months that exceeded the average height above sea level is xx.

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**REMEMBER:**

Before submitting your completed program to **Blackboard**, the input and output file paths must be set to:

u:\\engr 200\\lake\_powell.txt

u:\\engr 200\\lake\_powell\_report.txt