clc, clear all

%Is the file available

if ~exist('lake\_powell.txt','file')

fprintf('File not found\n')

else

% file available continue

%\*\*\*\*\*CONSTANT\*\*\*\*\*

NUM\_MONTHS = 12;

FIRST\_YEAR = 2013;

LAST\_YEAR = 2016;

%\*\*\*\*\*INPUT\*\*\*\*\*

months = 1:NUM\_MONTHS;

years = FIRST\_YEAR:LAST\_YEAR;

% read data file

lake\_powell = load( 'lake\_powell.txt' );

% print water levels with title and year column headings.

printWaterLevels( lake\_powell, years, NUM\_MONTHS )

% print water level summary stats

printWaterLevelSummary( lake\_powell, months, years )

end

function [] = printWaterLevels( lake\_powell, years, NUM\_MONTHS )

% print water levels with title and year column headings.

fprintf('Lake Powell Water Levels (in feet) \n');

fprintf('%6.0f %10.0f %10.0f', years)

%print the contents of the lake powell file

for k = 1:NUM\_MONTHS

fprintf('\n%7.2f %10.2f %10.2f', lake\_powell(k,:));

end

end

function [] = printWaterLevelSummary( lake\_powell, months, years)

overallAve = printYearAve( lake\_powell, years );

printAboveAve( lake\_powell, years, overallAve )

printMonthAve( lake\_powell, months )

end

%Part B ==================================================================

%Used to find average elevation overall and for every year

function overallAve = printYearAve( lake\_powell, years )

% Print Title and Year Colunm Headings

fprintf('\n\nPart B: Determine average elevation of water level for each year and overall average')

fprintf(' Average for Each Year (in feet)\n')

fprintf('%8.0f %8.0f %8.0f %8.0f', years)

% Find and print mean from each year

average\_elevation = mean(lake\_powell);

fprintf('\n%9.2f %8.2f %8.2f %8.2f\n', average\_elevation)

% Find and print overall average

overallAve = mean(average\_elevation);

fprintf(' Overall average: %7.2f feet\n\n', overallAve)

end

% Part C =================================================================

% Determine how many months of each year > overall average

function [] = printAboveAve( lake\_powell, years, overallAve)

% Print title

fprintf('Part C: Determine how many months of each year > overall average \n')

% Find and print the number of months each year that exceed the overall

% average

n = years(1,1);

while n <= years(1,4)

for x = 1:4

greaterThan = find(lake\_powell(:,x)>overallAve);

number\_above = length(greaterThan);

fprintf(' During %d the lake was above average for %d months\n',n,number\_above)

n = n+1;

end

end

end

% Part D =================================================================

% Determine and print average elevation of the water for each month

function [] = printMonthAve( lake\_powell, months )

% Display title and headings

fprintf('\nPART D: Determine and print average elevation of the water for each month\n')

fprintf(' Average elevation (in feet) of the water for each month\n')

fprintf(' Month Elevation\n')

% Find and print average elevation of water for each month

for k = 1:months(1,12)

average\_per\_month = mean(lake\_powell(k,:));

fprintf(' %4d %11.2f \n', k, average\_per\_month)

end

end