**Purdue University NORTHWEST DEPARTMENTS OF ENGINEERING**

**ENGR15100: Software Tools for Engineers**

**Laboratory 4**

**PURPOSE:** Learn about Relational/Logical Operators, Expressions, Functions

For each problem, create a MATLAB script file and name it FIRSTNAME\_LASTNAME\_LAB4\_ problemX.m. Put ALL the commands for the required steps in your script file:

* Be sure to clear the display and the memory.
* Display your name.
* Separate and label different steps using comments.

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%{

Class: ENGR15100: Software Tools for Engineers

Instructor: Xiaoli Yang

Author: [Student’s Name]

Assignment: Lab [No.]

File Name: FIRSTNAME\_LASTNAME\_LAB[No.]\_problem[No.].m

Date: [MM]/[DD]/[YY]

%}

%clear screen

clc

%clear workspace

clear

disp('Your Name Here');

disp('');

disp('starting code: ');

%Completing lab x

%your source code here%

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**problem 1** (40 points)**:**

1. Create a variable named dayTemps\_CHI and assign to it a vector whose elements are the following daily temperatures (in °F) recorded for Chicago in the month of August.

[75 79 86 86 79 81 73 89 91 86 81 82 86 88 89 90 82 84 81 79 73 69 73 79 82 72 66 71 69 66 66]

1. Create a variable named dayTemps\_SF and assign to it a vector whose elements are the following daily temperatures (in °F) recorded for San Francisco in the month of August.

[69 68 70 73 72 71 69 76 85 87 74 84 76 68 79 75 68 68 73 72 79 68 68 69 71 70 89 95 90 66 69]

1. Determine how many days San Francisco’s temperature was above average.
2. Compute how many days Chicago’s temperature was in the range [62°F, 78°F].
3. Compute how many days San Francisco’s temperature was cooler than 72°F OR warmer than 80°F.
4. Compute how many days Chicago’s temperature was NOT between 70°F and 90°F, inclusive.
5. Compute how many days San Francisco’s temperature was NOT colder than 73°F AND NOT warmer than 89°F.
6. Compute Chicago’s temperatures that are warmer than 84°F but cooler than 90°F.
7. Compute San Francisco’s temperatures that are warmer than 65°F, cooler than 72°F, but NOT 69°F.
8. Compute on which day(s) San Francisco’s temperature was warmer OR the same as the temperature in Chicago?
9. Compute on which day(s) the temperature was the same in both cities.

**problem 2** (60 points)**:**

1. Create a variable named x and assign to it a row vector whose elements equally spaced values starting with -15, ending at most with 15, in steps of 0.1.
2. Create a variable named f. This variable is to store a row vector whose elements are those obtained by evaluating the following piecewise function below for every element of row vector x.

Compute the elements of row vector f using a combination of logical operations, relational operators, logical indexing, and mathematical operations.

1. Plot f vs. x in a Figure Window named Figure 1. Format the plot according to the following specifications.

* Title the plot using the string ‘f(x) vs. x’.
* Label the graph’s horizontal axis with the string ‘x’.
* Label the graph’s vertical axis with the string ‘f(x)’.
* Activate the major access grid to aid in visualizing the plot.

**SUBMITTING YOUR LAB:**

Submit your lab by uploading .m file using the Blackboard Assignment feature no later than the date specified.