clc

clear

format compact

disp('Problem: 1')

%Expected output:

% Part a: 0

% Part b: y = 0

% Part c: y = 2

% Part d: y = 1

%Part a

5+3>32/4

%Part b

y=2\*3>10/5+1>2^2

%Part c

y=2\*(3>10/5)+(1>2)^2

%Part d

5\*3-4\*4<=~2\*4-2+~0

disp('Problem: 3')

%Part a: [1 1 1 1 0 1 1 1 1]

%Part b: [0 0 0 0 1 0 0 0 1]

%Part c: [1 0 0 1 0 1 0 1 1]

%Part d: [0 1 0 -1 0 -2 3 3 2]

v = [4 -2 -1 5 0 1 -3 8 2];

u = [0 2 1 -1 0 -2 4 3 2];

parta = ~(~v)

partb = u == v

partc = u - v < u

partd = u - (v < u)

disp('Problem: 6')

TCH = [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];

TSF = [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];

disp('Part (a)')

%Calculates average for each city

averageTCH = mean(TCH);

averageTSF = mean(TSF);

fprintf('The average temperature in Chicago is %3.3f F \nThe average temperature in San Francisco is %3.3f F.\n',averageTCH,averageTSF)

disp('Part (b)')

%Creates vectors with 1 on the dates that are above average

aboveTCH = TCH>averageTCH;

aboveTSF = TSF>averageTSF;

%Sums the above vectors to find the number of days above average temperature

numberaboveTCH = sum(aboveTCH);

numberaboveTSF = sum(aboveTSF);

fprintf('The temperature is above average in Chicago for %.i days.\nThe temperature is above average in San Francisco for %.i days\n', numberaboveTCH, numberaboveTSF)

disp('Part (c)')

%Creates vectors with 1 on the dates that are above average, 0 otherwise

belowTCH = TCH<averageTCH;

belowTSF = TSF<averageTSF;

%Sums the above vectors to find the number of days above average temperature

numberbelowTCH = sum(belowTCH);

numberbelowTSF = sum(belowTSF);

%Creates vectors with the index numbers for each day that is below average

datesbelowTCH = find(belowTCH==1);

datesbelowTSF = find(belowTSF==1);

fprintf('The temperature is below average in Chicago for %.i days.\nThe temperature is below average in San Francisco for %.i days\n', numberbelowTCH, numberbelowTSF)

disp('The dates that the temperature is below average for Chicago are')

disp(datesbelowTCH)

disp('The dates that the temperature is below average for San Francisco are')

disp(datesbelowTSF)

disp('Part (d)')

%Creates a vector with 1 on the dates that have the same temperature, 0 otherwise

sametemp = TCH==TSF;

%Sums the sametemp vector to count the number of days that have the same temperature

numdayssame = sum(sametemp);

%Creates a vector with the index number for the days that have the same temperature

datessametemp = find(sametemp==1);

fprintf('Chicago and San Francisco had the same temperature on %.i days\n', numdayssame)

disp('The dates that the temperature was the same for Chicago and San Francisco were')

disp(datessametemp)

Result:

Problem: 1  
ans = 0  
y = 0  
y = 2  
ans = 1  
Problem: 3  
parta =  
  
 1 1 1 1 0 1 1 1 1  
  
partb =  
  
 0 0 0 0 1 0 0 0 1  
  
partc =  
  
 1 0 0 1 0 1 0 1 1  
  
partd =  
  
 0 1 0 -1 0 -2 3 3 2  
  
Problem: 6  
Part (a)  
The average temperature in Chicago is 79.129 F   
The average temperature in San Francisco is 74.548 F.  
Part (b)  
The temperature is above average in Chicago for 16 days.  
The temperature is above average in San Francisco for 11 days  
Part (c)  
The temperature is below average in Chicago for 15 days.  
The temperature is below average in San Francisco for 20 days  
The dates that the temperature is below average for Chicago are  
 1 2 5 7 20 21 22 23 24 26 27 28 29 30 31  
The dates that the temperature is below average for San Francisco are  
 Columns 1 through 16:  
 1 2 3 4 5 6 7 11 14 17 18 19 20 22 23 24  
 Columns 17 through 20:  
 25 26 30 31  
Part (d)  
Chicago and San Francisco had the same temperature on 1 days  
The dates that the temperature was the same for Chicago and San Francisco were  
 30