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%% Question 01 Variables Section 1
% Creating single element variables
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%A = < a real number in the range 8 to 22) >
A = rand(1,1)*(22-8) + 8
%B = < an integer in the inclusive range from 1 to 6 >
B = randi([1 6],1,1)
%C= < a real number in the range 0 to 25 >
C = rand(1,1)*25
%D = < an integer in the inclusive range from 50 to 150 >
D = randi([50 150],1,1)
%E = < A real number in the range 20 to 80 >
E = rand(1,1)*(80-20) + 20
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%% Question 02
%. Create variables for the three resistors, store values in each,
% Calculate the combined resistance RT if R1=1000, R2=2200, R3=1500.
%
% Combined Resistance :  $R_t = 1 / [(1/r_1)+(1/r_2)+(1/r_3)]$ 
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R1=1000; % first resistor
R2=2200; % second resistor
R3=1500; % third resistor
Rt = 1/[(1/R1)+(1/R2)+(1/R3)] % combined resistance
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%% Question 3
%Create two variables x and y and store numbers in them.
%Write an expression that would be TRUE if the value of x is greater than two
%or if the value of y is less than nine, but not if both of those are true.
clear all %so that I can test different values
x = 54
y = 2
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xor(x>2,y<9)
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%% Question 4 Arrays
% Create the following arrays as variables
% A = [1 2 3 4 5] using the colon operator
% B = [2 4
%      8 10
%      9 15]
% C a 3x3 matrix of 6's
% D a 1x5 vector of random integers between 5 & 18
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A = 1:5
B = [2 4;8 10;9 15]
C = [6 6 6;6 6 6;6 6 6]
D = randi([5 18],5,1)
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%% Question 5
E = [A(1:3)'; A(3:5)'] % create matrix E with A
Q2b = E + B % adding matrices
Q2c = E - B % subtracting matrices
Q2d = E.* B % multiplying matrices
Q2e = E*B' % E times transpose of B
A(mod(A,2)==0) % identify which values of A are divisible by 2
[MinD1,I1]=min(D) %min values of D and it's index
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Q2i=sum(C(:))% sum of all elements C
Q2j=E>=3 % values of E that are greater than or equal to 3
Q2k=B>E % which elements of B are greater than corresponding elements in E
A = A'% A into a column vector

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%% Question 6 Solve w/out Matlab

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% a. xor('e' == 'g' - 2, 2 > 5)
% e = 101, (g = 103)- 2 = 101 so the left side is true
% 2 > 5 is not true
% final result is 1 because there is exactly one true parameter (it will
% return 0 is there are two or zero true parameters).

% b. 10 > 6 + 5
% 10 is not greater than 11 so it will return 0

% c. 4==6+4
% 4 does not equal 10 so it will return 0

% d. 'b'>'a'+1
% 'b' = 98
% 'a' = 97
% 98 > 97 + 1 is 98 > 98 which is false so it returns 0
% it should be 'b' == 'a' + 1 to return 1

% e. 'j'=='k'-1&&6<7
% 'j' == 'k' - 1 is 106 == 107 - 1 (true)
% 6 < 7 (true)
% since both are true and it's an &&, it returns 1 (true)

% f. xor('c' == 'd' - 1, 2 < 1)
% only one can be true
% 'c' == 'd' - 1 returns (true)
% 2 < 1 returns (false)
% since only one is true, the xor statement returns 1 (true)

% g.13>5>1
% Needs to be (13>5)>1, the result will be zero if there are no parenteces
% since matlab will not read it correctly

% h.'a' >= 'c' -2
% 'a' >= 'c' - 2 is 97 >= 99 - 2 or 97 >= 97,
% 97 is greater than or equal to 97 (equal to), which returns true (1)

% i. (12<5)+6
% (12<5) is zero since it is false
% 0 + 6 is 6, so it will return 6

%'j'=='k'-2 || 5< 7
% or statements will return 1 if either are true
% 'j' == 'k'-2 is 106 == 107 - 2 (false)
% 5 < 7 is (true)
% will return true (1) since one of the arguements is true

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