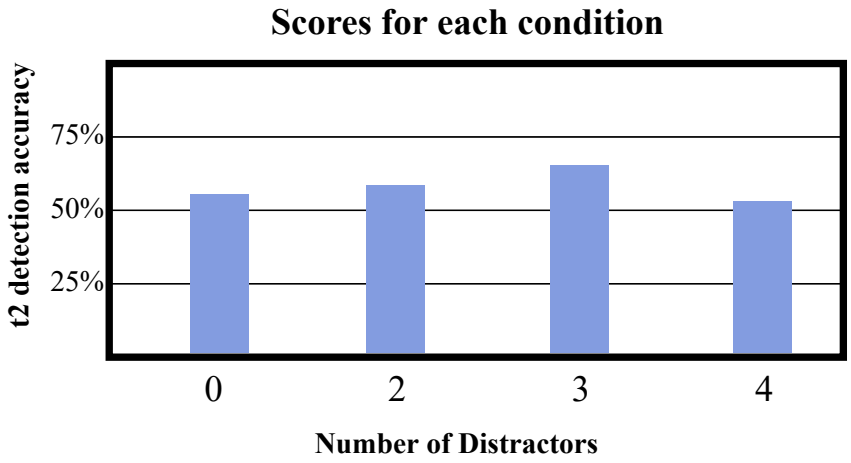
4a. Produce a column graph using SVG graphics. Note that the PERL program will create the SVG code in the same way that the PERL program created the graph in homework assignment 5. This will be more difficult because you will have to use SVG to create a column graph instead of a bar graph.



4b. Display all of the data records in a table ordered by seq. This will verify that the counterbalancing was correct.

CB	0 distractors	2 distractors	3 distractors	4 distractors
3	0.32	0.20	0.21	0.14
4	0.40	0.60	0.60	0.40
1	0.40	0.80	0.40	0.80
2	0.83	0.67	0.83	0.67
3	0.83	0.33	0.67	0.50
3	0.67	0.83	1.00	0.83
2	0.83	0.83	0.67	0.83
4	0.50	0.67	0.83	0.67
1	0.50	0.50	0.83	0.33
2	0.67	0.83	1.00	0.50
0	0.00	0.00	0.00	0.00

4c. Perform a statistical analysis on the data. The type of analysis will depend upon the design of your experiment. You will be given some analysis tools to verify the results of your experiment, but your PERL program must do the calculations of the analysis. The specifics of these calculations will be given to you in a later week.

Step 1: Calculate Means of Participants

PID	avg score
1	0.2175
2	0.5
3	0.6
4	0.75
5	0.5825
6	0.8325
7	0.79
8	0.6675
9	0.54
10	0.75
11	0

Step 2: Calculate Means of Groups
X1 : 0.540909
X2 : 0.569091
X3 : 0.640000

X4 : 0.515455

Step 3: Calculate Grand Mean (Xg)
Xg = (X1 + X2 + X3 + X4) / 4
=> 0.540909 + 0.569091 + 0.640000 +0.515455 / 4
=0.56636375

Step 4: Calculate sum of squares
SS between groups : 0.0953631836382501
SS between subjects : 2.58991818181875
total SS : 3.36921818181875

SS Residual : (3.36921818181875 - 2.58991818181875 - 0.0953631836382501) = **0.68393681636175**

Step 5: Calculate Degrees of Freedom. k is the number of groups. p is the number of participants. NG is total number of scores.
df Residual = Ng - k - p + 1
=> 44 - 4 - 11 + 1
dfRes= 30

df Between occasions = k -1
=> 4 -1
dfB= 3

Step 6: Calculate MSResidual
MS Residual = SS Residual/df Residual
=>0.68393681636175 / 30
= 0.022797893878725

Step 7: calculate MS Between Groups.
MS Between Groups = SS Between Groups/df Between Groups
= 0.0953631836382501 / 3
=0.0317877278794167

Step 8: Calculate Observed F Value
F = MS Between Groups / MS Residual
= 0.0317877278794167 / 0.022797893878725
= 1.39432739043851

Step 9: Find Critical t Value
observed F value of 1.39432739043851 is less than critical value of 2.92
Fail to reject the null hypothesis