

```
1 % NAME: ADITYA BARMAN
2 % ROLL: 002320601024
3 % PROBLEM 12. Spearman's Rank Correlation with Perfect agreement
4
5
6 clc, clearvars, close all
7
8 math_x = [43 77 64 96 48 35 86 71];
9 stat_y = [41 68 50 82 49 36 79 65];
10 math_x_cp = math_x;
11 stat_y_cp = stat_y;
12 n = length(math_x);
13
14 R_x = zeros(1, n);
15 R_y = zeros(1, n);
16
17 for i = 1:n
18     [valx, idx] = max(math_x);
19     math_x(idx) = -Inf;
20     R_x(idx) = i;
21
22     [valy, idx] = max(stat_y);
23     stat_y(idx) = -Inf;
24     R_y(idx) = i;
25 end
26
27 d_sq = (R_x - R_y) .^ 2;
28 d_sq_sum = sum(d_sq);
29
30 sp_num = 6 * d_sq_sum;
31 sp_denom = n * ((n ^ 2) - 1);
32
33 sp = 1 - (sp_num / sp_denom);
34 table_t = zeros(8,5);
35 table_t(1:8, 1) = math_x_cp;
36 table_t(1:8, 2) = stat_y_cp;
37 table_t(1:8, 3) = R_x;
38 table_t(1:8, 4) = R_y;
39 table_t(1:8, 5) = d_sq;
40
41 % Print the table headers
42 fprintf('%-10s %-10s %-10s %-10s %-10s\n', 'X', 'Y', 'R_x', 'R_y', 'd_sq');
43
44 % Print the table values
45 for i = 1:n
46     fprintf('%-10d %-10d %-10d %-10d %-10d\n', table_t(i, 1), table_t(i, 2), \
table_t(i, 3), table_t(i, 4), table_t(i, 5));
```

```
47 end
48
49 fprintf('\nThe Spearman Rank Correlation is %.4f\n', sp);
50
51
52
53 % ===== OUTPUT =====
54
55
56 % X          Y          R_x      R_y      d_sq
57 % 43         41         7         7         0
58 % 77         68         3         3         0
59 % 64         50         5         5         0
60 % 96         82         1         1         0
61 % 48         49         6         6         0
62 % 35         36         8         8         0
63 % 86         79         2         2         0
64 % 71         65         4         4         0
65
66 % The Spearman Rank Correlation is 1.0000
67
68
69 % =====
70
```