

	u_0	u_1	u_2	u_3	u_4	u_5	u_6	
i_0	5	5	2	0	1	?	?	→ 2.6
i_1	4	?	?	0	?	2	?	→ 2
i_2	?	4	1	?	?	1	1	→ 1.75
i_3	2	2	3	4	4	?	4	→ 3.17
i_4	2	0	4	?	?	?	5	→ 2.75

a) Original utility matrix \mathbf{Y} and mean item ratings.

	u_0	u_1	u_2	u_3	u_4	u_5	u_6
i_0	2.4	2.4	-0.6	-2.6	-1.6	0	0
i_1	2	0	0	-2	0	0	0
i_2	0	2.25	-0.75	0	0	-0.75	-0.75
i_3	-1.17	-1.17	-0.17	0.83	0.83	0	0.83
i_4	-0.75	-2.75	1.25	0	0	0	2.25

b) Normalized utility matrix $\bar{\mathbf{Y}}$.

	i_0	i_1	i_2	i_3	i_4
i_0	1	0.77	0.49	-0.89	-0.52
i_1	0.77	1	0	-0.64	-0.14
i_2	0.49	0	1	-0.55	-0.88
i_3	-0.89	-0.64	-0.55	1	0.68
i_4	-0.52	-0.14	-0.88	0.68	1

c) Item similarity matrix \mathbf{S} .

	u_0	u_1	u_2	u_3	u_4	u_5	u_6
i_0	2.4	2.4	-0.6	-2.6	-1.6	-0.29	-1.52
i_1	2	2.4	-0.6	-2	-1.25	0	-2.25
i_2	2.4	2.25	-0.75	-2.6	-1.20	-0.75	-0.75
i_3	-1.17	-1.17	-0.17	0.83	0.83	0.34	0.83
i_4	-0.75	-2.75	1.25	1.03	1.16	0.65	2.25

d) Normalized utility matrix $\bar{\mathbf{Y}}$.