

HW2 Solutions

Q1)

a. JACCARD similarity between
user x and user y

$$= \frac{|r_x \cap r_y|}{|r_x \cup r_y|}$$

$$\text{Sim}(\text{user 1}, \text{user 2}) = \frac{3}{6}$$

$$\text{Sim}(\text{user 1}, \text{user 3}) = \frac{2}{6}$$

$$\text{Sim}(\text{user 2}, \text{user 3}) = \frac{3}{6}$$

b) COSINE similarity between
user x and user y

$$= \frac{r_x \cdot r_y}{|r_x| |r_y|}$$

$$\text{sim}(\text{user1}, \text{user2}) = 0.61$$

$$\text{sim}(\text{user1}, \text{user3}) = 0.51$$

$$\text{sim}(\text{user2}, \text{user3}) = 0.61$$

c) Normalized Matrix

	item1	item2	item3	item4	item5	item6
user1	0.25	1.25	0	1.25	-2.75	0
user2	0	0.4	1.4	0.4	-1.6	-0.6
user3	-0.5	0	-1.5	0.5	0	1.5

d) $\text{sim}(\text{user1}, \text{user2}) = 0.72$

$$\text{sim}(\text{user1}, \text{user3}) = 0.07$$

$$\text{sim}(\text{user2}, \text{user3}) = -0.55$$