

Q:1

```
Classes = pd.DataFrame({'class_id': [1, 2, 3], 'title': ['Math', 'English', 'Spanish']})
gradeA = pd.merge(Classes, Grades, on='class_id')
gradeA = gradeA[gradeA['grade']=='A']
student=pd.merge(Students, gradeA, on='student_id')
student=student[student['name']=='Alice']
student
```

	name	student_id	class_id	title	grade
0	Alice	1	1	Math	A

Q:2:

```
clusters = pd.merge(resto, resto, on='cluster')
clusters = clusters[clusters.id_x < clusters.id_y]
print (len(clusters))
clusters[:10]
```

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	id_x	cluster	name_x	city_x	id_y	name_y	city_y
4	43	23	21 club	new york	44	21 club	new york city
10	145	74	abruzzo	atlanta	146	abruzzo	atlanta
20	184	94	alain rondelli	san francisco	185	alain rondelli	san francisco
36	186	95	aqua	san francisco	187	aqua	san francisco
40	45	24	aquavit	new york	46	aquavit	new york city
46	1	0	arnie morton's	los angeles	2	arnie morton's	los angeles
51	3	1	art's delicates	studio city	4	art's deli	studio city
58	47	25	aureole	new york	48	aureole	new york city
62	147	75	bacchanalia	atlanta	148	bacchanalia	atlanta
79	5	2	hotel bel-air	bel air	6	bel-air hotel	bel air

Q:3:

```
prod = prod[prod.id_x < prod.id_y]
print len(prod)
prod[:5]
367653
```

	id_x	cluster_x	name_x	city_x	id_y	cluster_y	name_y	city_y
1	560	453	2223	san francisco	781	675	103 west	atlanta
9	560	453	2223	san francisco	561	454	acquarello	san francisco
12	560	453	2223	san francisco	708	602	afghan kebab	new york city
20	560	453	2223	san francisco	782	676	alon's at the tea	atlanta
24	560	453	2223	san francisco	762	656	andre's french	las vegas

