

user	item	correct
2	2	1
2	2	0
2	2	0
2	3	0
2	3	1
1	2	???
1	1	???

data.csv

encode →

Users		Items			Skills			Wins			Fails		
1	2	Q ₁	Q ₂	Q ₃	KC ₁	KC ₂	KC ₃	KC ₁	KC ₂	KC ₃	KC ₁	KC ₂	KC ₃
0	1	0	1	0	1	1	0	0	0	0	0	0	0
0	1	0	1	0	1	1	0	1	1	0	0	0	0
0	1	0	1	0	1	1	0	1	1	0	1	1	0
0	1	0	0	1	0	1	1	0	2	0	0	1	0
0	1	0	0	1	0	1	1	0	2	0	0	2	1
1	0	0	1	0	1	1	0	0	0	0	0	0	0
1	0	1	0	0	0	0	0	0	0	0	0	0	0

sparse matrix X

IRT

KTM

PFA