

Recipes

name	recipe_id	ingredients	ingredient_ids
spaghetti carbonara	457	['egg', 'pasta', 'parmesan', 'bacon']	[4458, 124, 45, 7894]



Ingredients

ingredient_id	vector_i
4458	4
124	0
45	1
7894	7



Ingredient vector u

$[1, 1, 0, 1, 0, 0, 0, 1, 0, \dots, 0]$