



Knowledge Discovery Of Online Recipe Between Countries Using Network Analysis

2016/1/7 Thursday

**Presented by
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1. LITERATURE REVIEW

Recipe Relationship

- **Using network analysis to understand the relation between cuisine and culture**
(Kular, Menezes, & Ribeiro, 2011)

Ingredient Relationship

- **Flavor network and the principles of food pairing**
(Ahn, Ahnert, Bagrow, & Barabasi, 2011)

2. METHODOLOGY

Recipe scrapping

- With python beautifulsoup package, we parse 8331 recipes from BBC Good Food.
- Sample 50 from 4 Europe region(Northern, Western, Central, Southern).

Data preprocessing

- Use NLP to identify NOUN from coking method and ingredients, then intersect two parts.
- Regular expression help us take out the quantifier.
- Assign the ingredients bigger than recipe to “many” and vice versa.

2. METHODOLOGY



Black Forest gâteau

★★★★☆ (35 ratings)

By Sarah Cook

[Magazine subscription – 5 issues for £5](#)



Cook: 40 mins



Easy



Serves 8 - 10

Prep 1 hr plus cooling

Impress your guests with this chocolate cherry layered cream cake - a revamped version of a retro classic

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Nutrition *per serving (10)*

kcalories	fat	saturates	carbs	sugars	fibre	protein	salt
859	48.9g	29.9g	93.7g	73.6g	2.6g	7.2g	0.7g

Save to My Good Food | +

Print



2. METHODOLOGY



Black Forest gâteau

Ingredients

175g salted butter, plus extra for greasing
200g bar dark chocolate
300g plain flour
375g golden caster sugar
25g cocoa
1 tsp bicarbonate of soda

Method

1. Heat oven to 180C/160C fan/gas 4. Grease and line the base of 3 x 20cm cake tins. Boil the kettle. Put the butter and 75g chocolate broken into chunks in a small pan and gently heat, stirring, until completely melted.

2. Mix together the flour, sugar, cocoa and bicarbonate of soda with a pinch of salt in a mixing bowl. Whisk the eggs and buttermilk or

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kcalories	fat	saturates	carbs	sugars	fibre	protein	salt
859	48.9g	29.9g	93.7g	73.6g	2.6g	7.2g	0.7g

2. METHODOLOGY

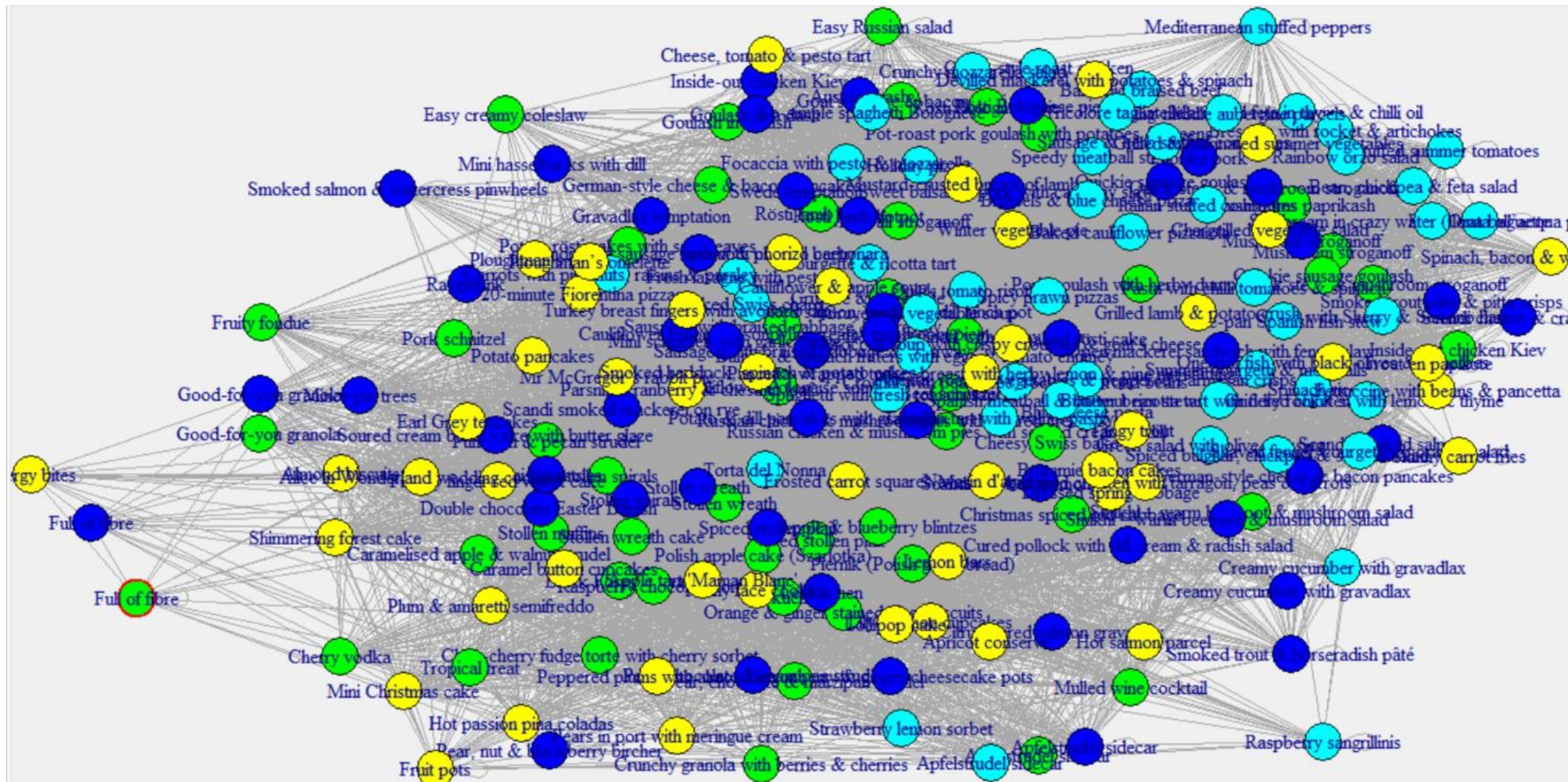
Building Network

- ingredient-by-recipe two-mode network
- recipe-by-recipe one-mode network
- ingredient-by-ingredient one-mode network
- ingredient-by-ingredient one-mode network with direction

2. METHODOLOGY

	Pork schnitzel	Orange & ginger stained glass biscuits	Black Forest gâteau	Full of fibre	Russian chicken & mushroom pies with soured cream & dill	Pot-roast pork goulash with potatoes & greens	Cheesy Swiss bake	Sausages with braised cabbage & caraway	German-style cheese & bacon pancakes	Pie (Pork & gingerbread)	Bacon	
Pork schnitzel	5	1	2	0	2	1	1	2	0		0	0
glass biscuits	1	9	4	0	3	0	1	1	0		0	0
Forest gâteau	2	4	13	0	3	0	2	1	0		1	0
Full of fibre	0	0	0	6	0	0	0	0	0		0	0
with soured cr...	2	3	3	0	13	2	2	3	1		0	0
atoes & greens	1	0	0	0	2	10	2	5	1		0	0
esy Swiss bake	1	1	2	0	2	2	8	2	2		5	0
age & caraway	2	1	1	0	3	5	2	10	2		0	2
acon pancakes	0	0	0	0	1	1	2	2	10		0	0
gingerbread)	2	2	5	0	2	0	2	1	1		0	0

3. RESULTS (RECIPE-BY-RECIPE)



Western European



Central European

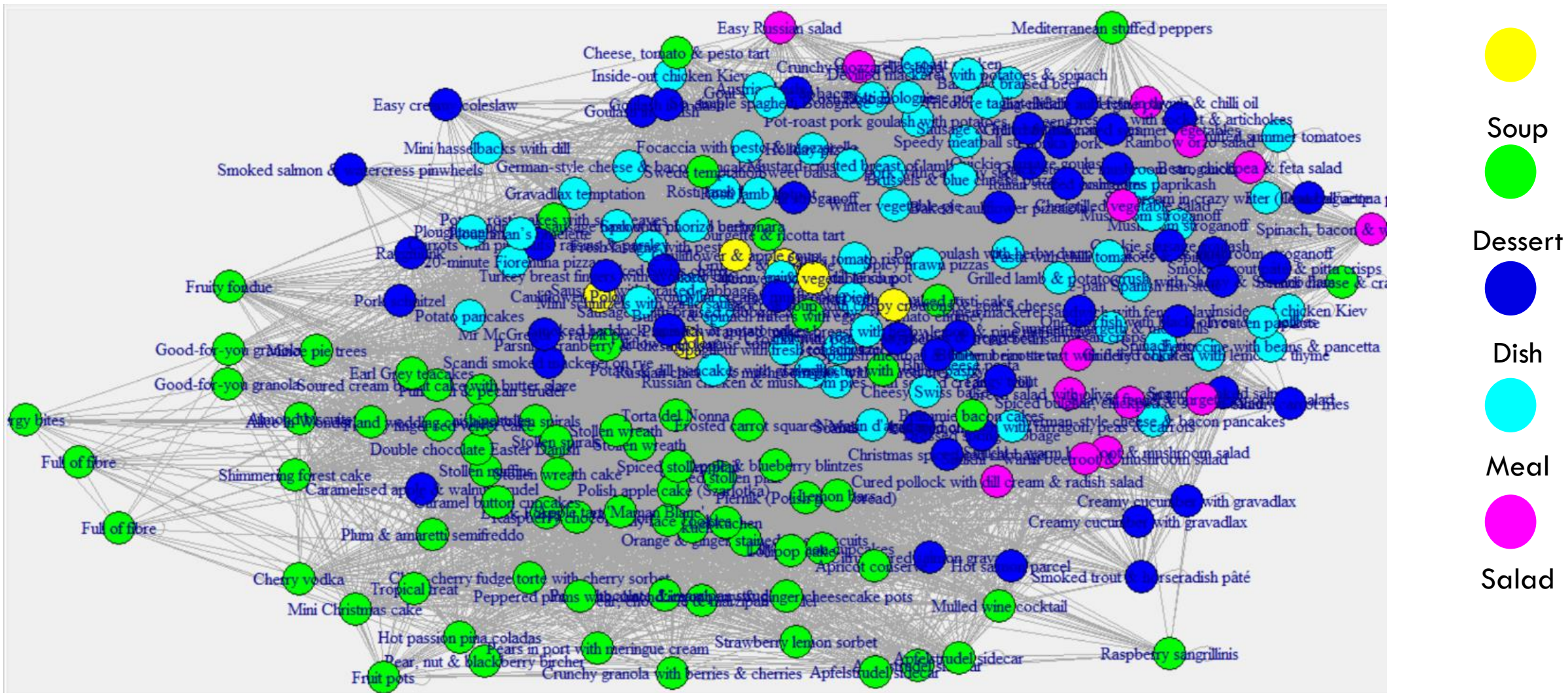


Northern European



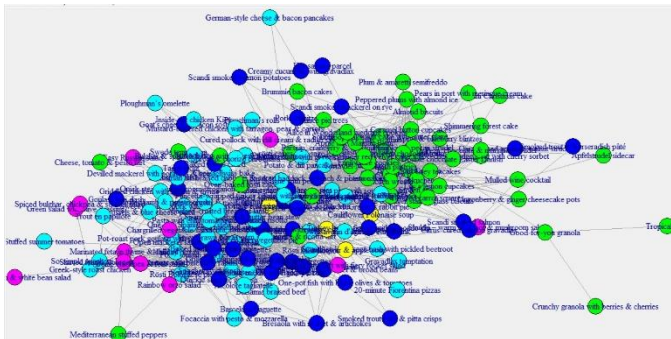
Southern European

3. RESULTS (RECIPE-BY-RECIPE)

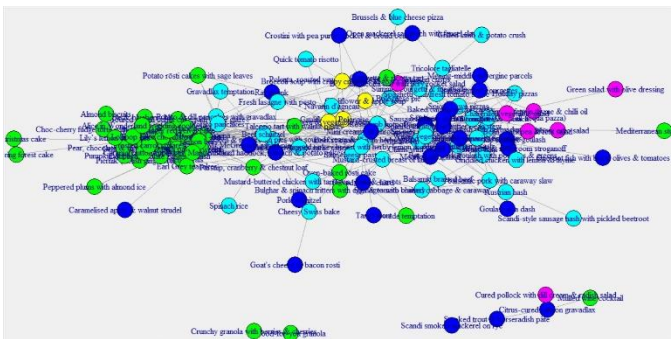


3. RESULTS (RECIPE-BY-RECIPE)

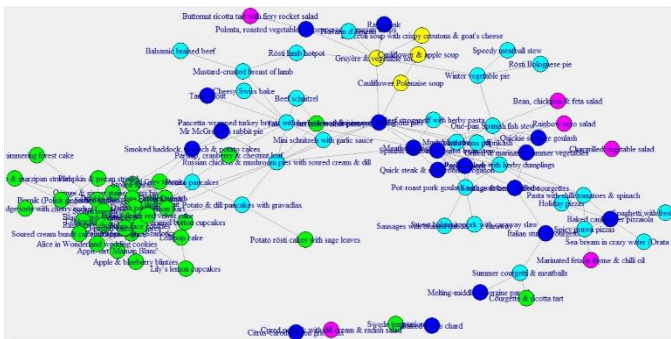
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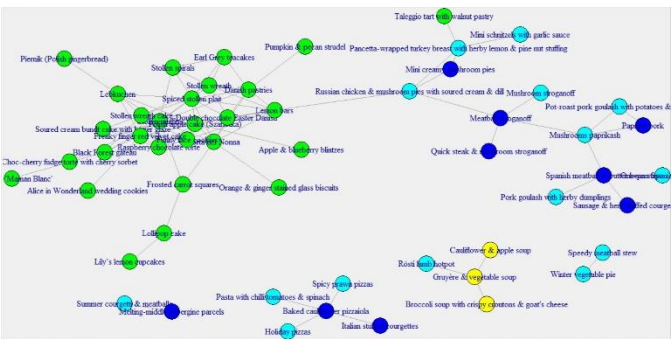
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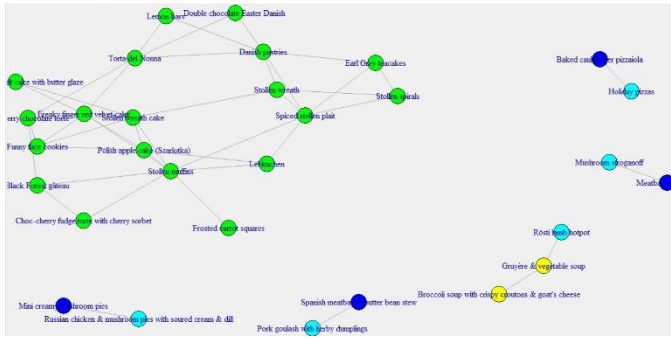
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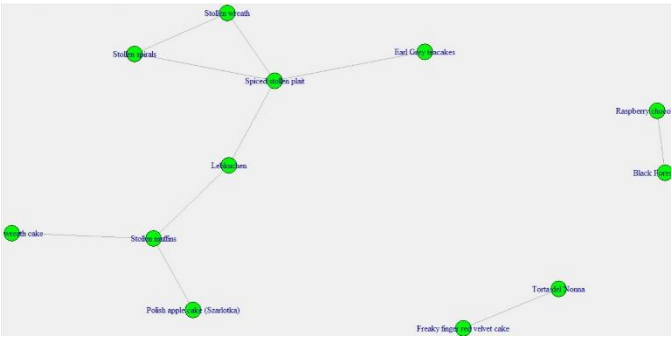
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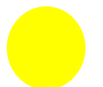






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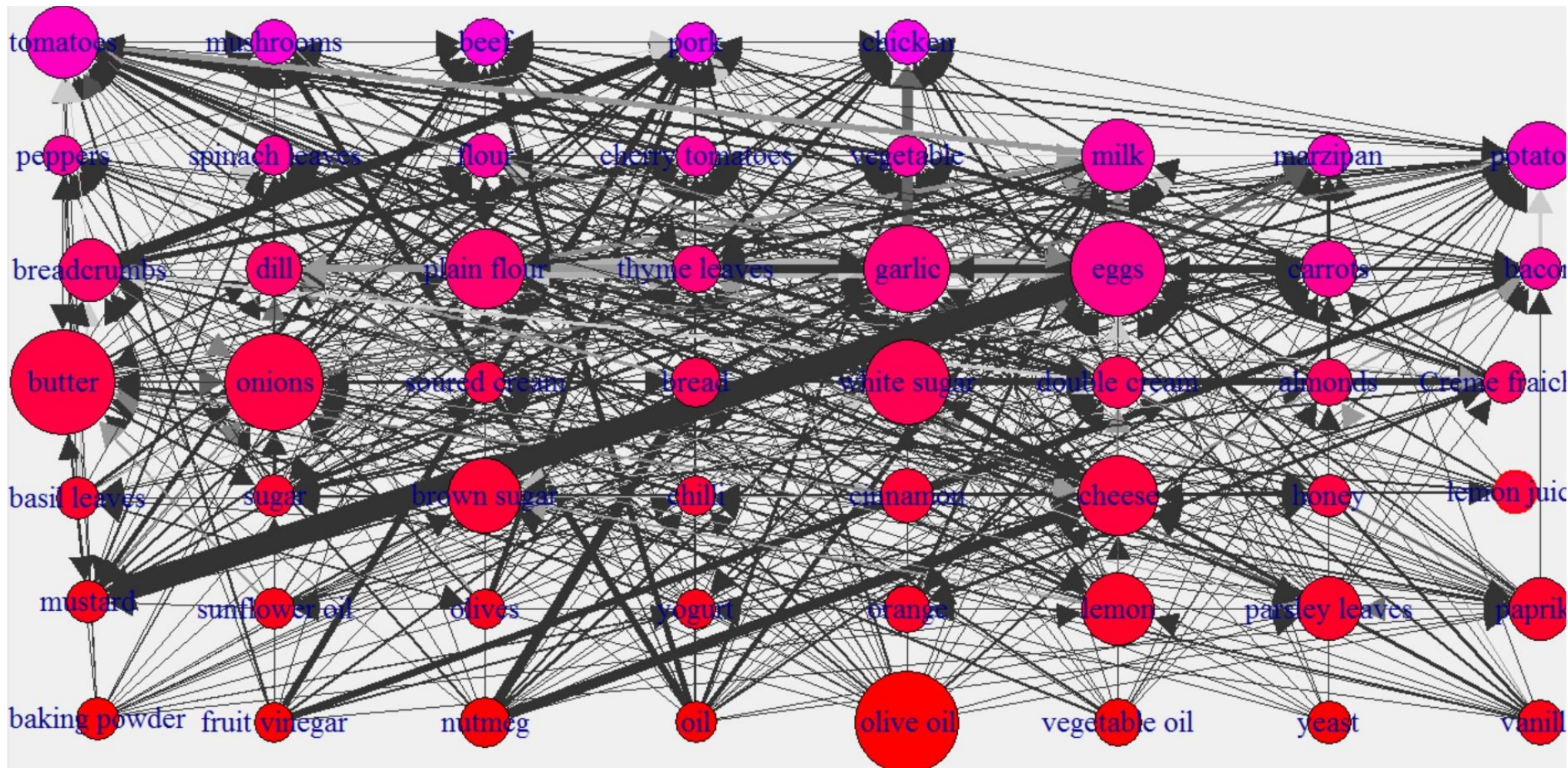


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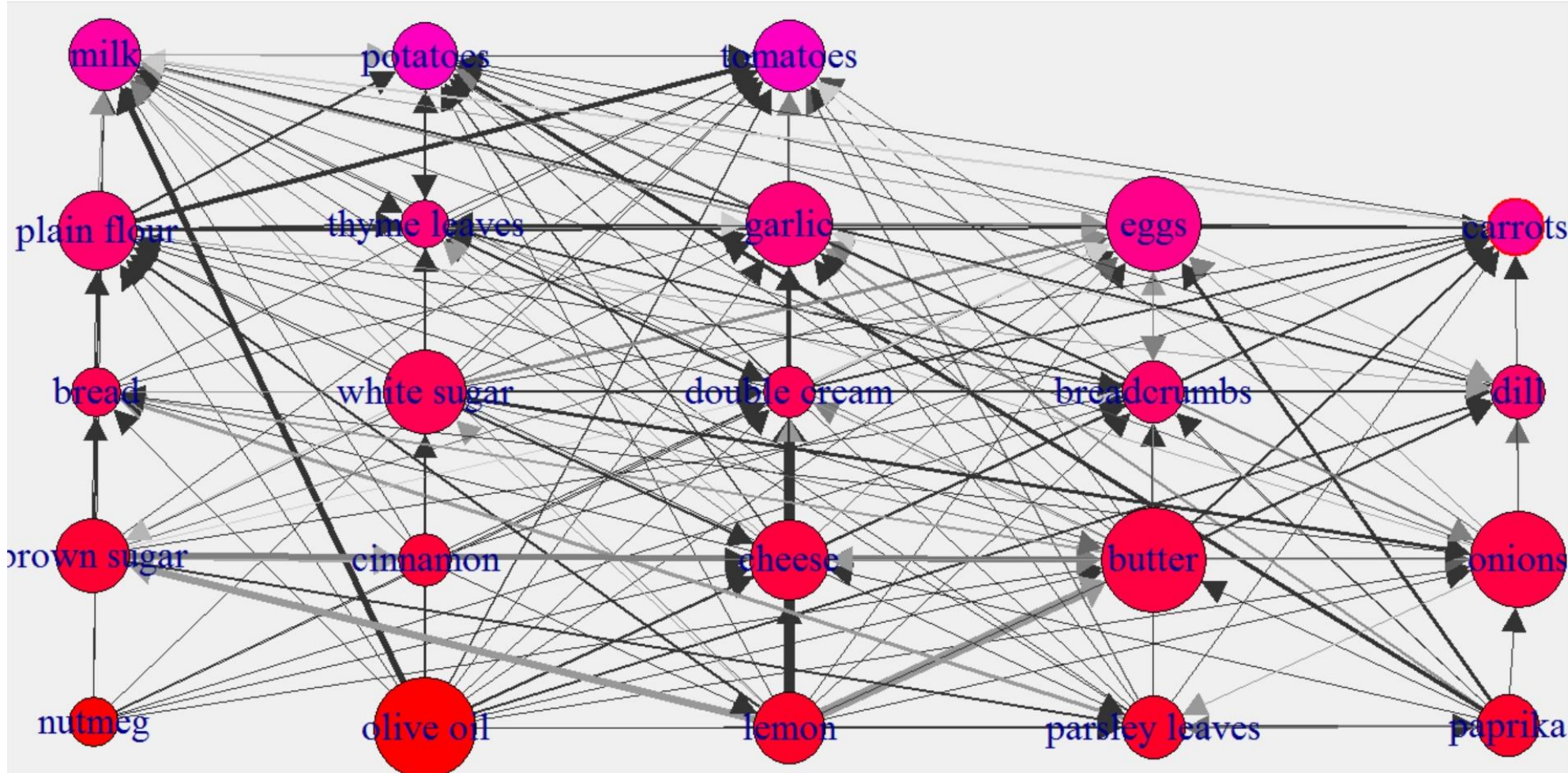
-  Soup
-  Dish
-  Dessert
-  Meal
-  Salad

3. RESULTS (INGREDIENT-BY-INGREDIENT)



edge color	purity
edge size	linkage times
vertex color	pink → main ingredient
vertex size	degree size

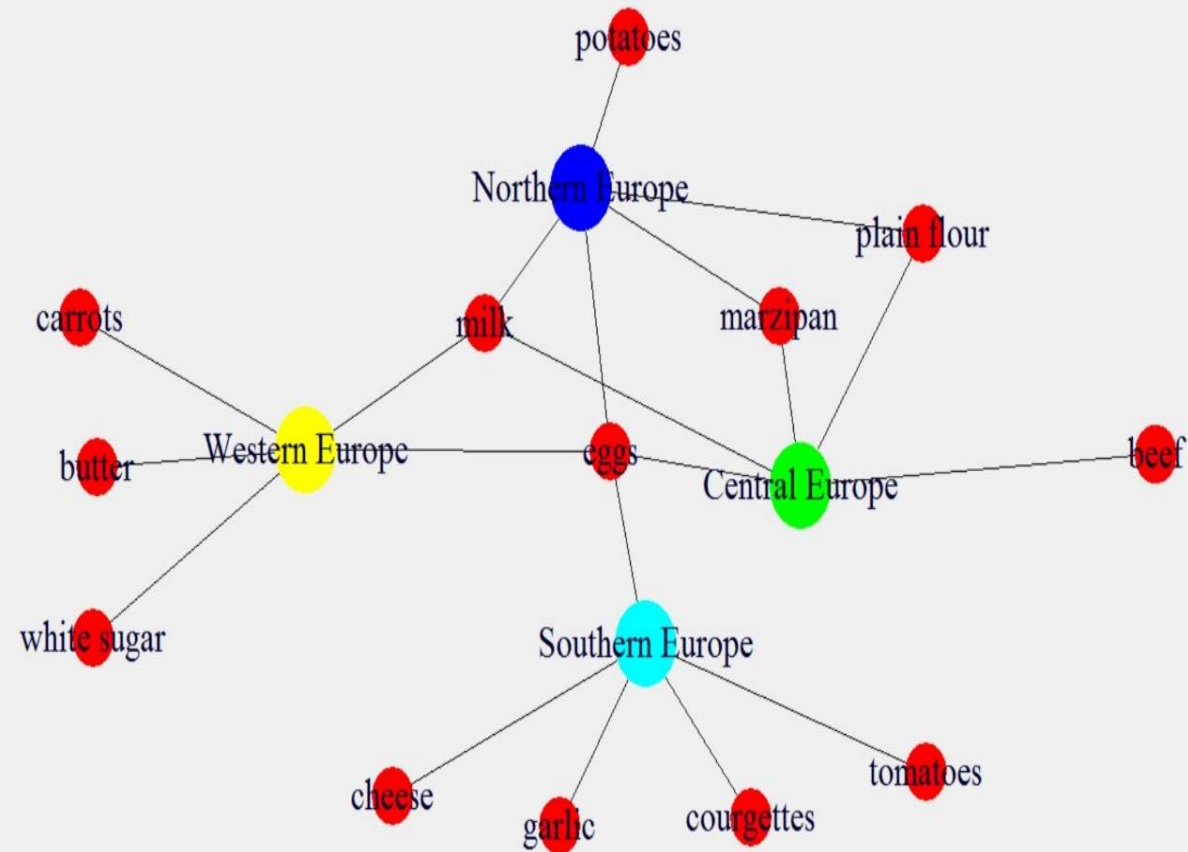
3. RESULTS (INGREDIENT-BY-INGREDIENT)



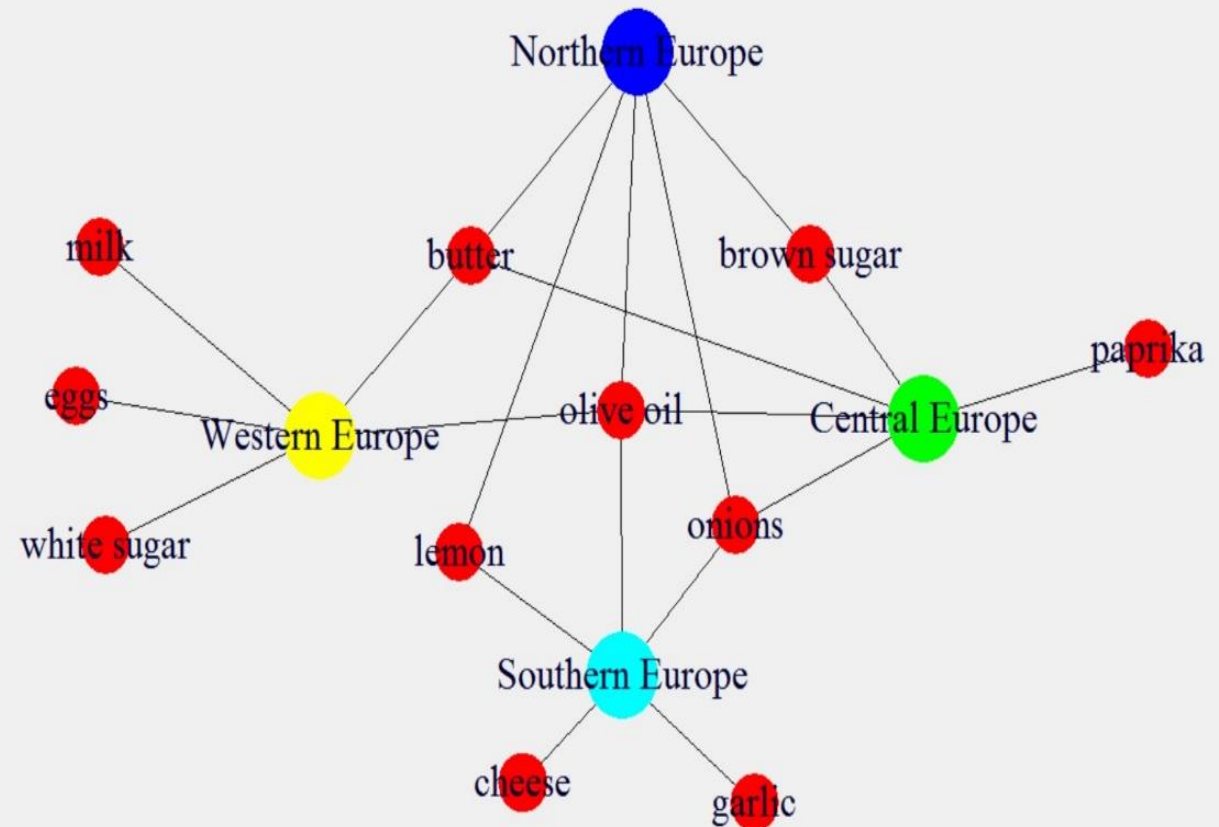
edge color	purity
edge size	linkage times
vertex color	pink → main ingredient
vertex size	degree

3. RESULTS (INGREDIENT-BY-RECIPE)

Main ingredient

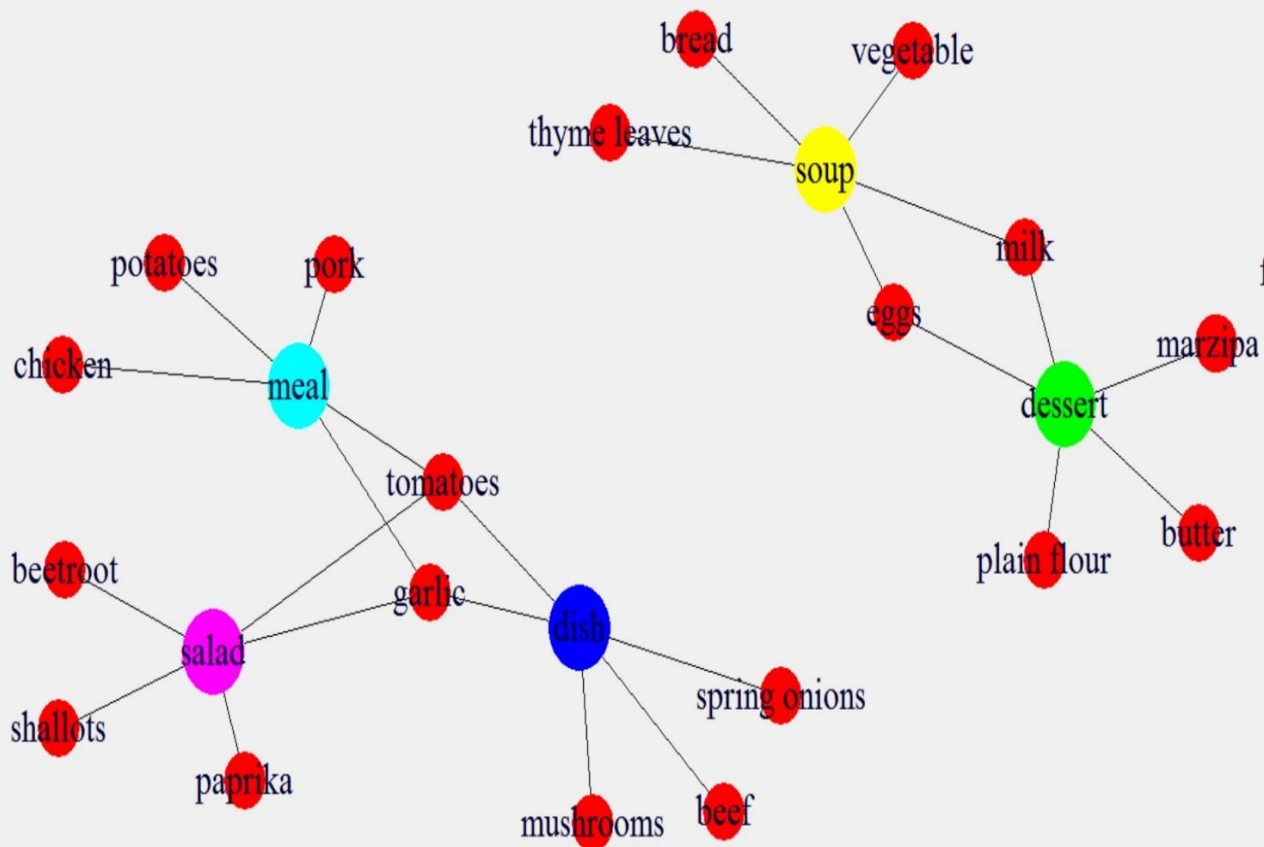


Minor ingredient

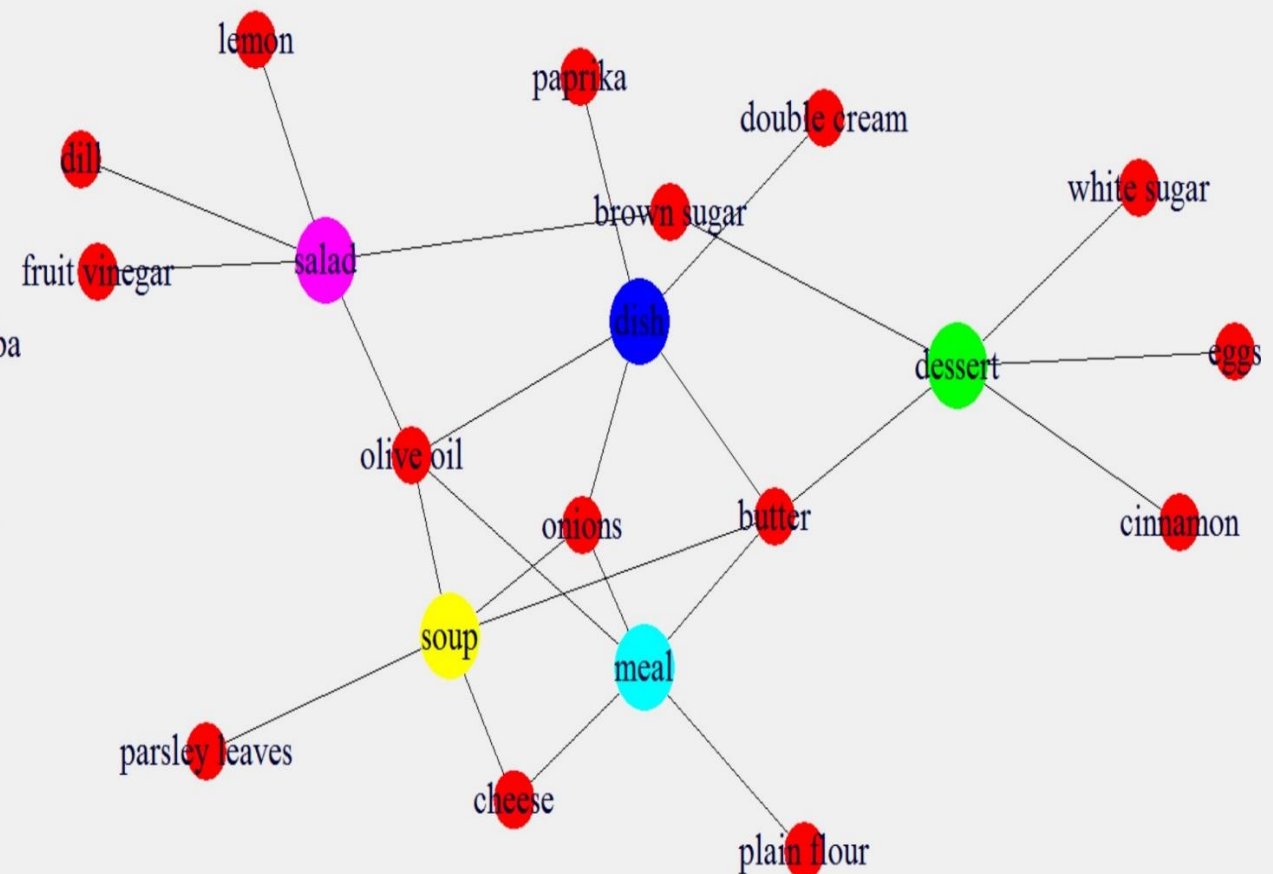


3. RESULTS (INGREDIENT-BY-RECIPE)

Main ingredient



Minor ingredient



4. DISCUSSION

1. Quantifiers recognition and Quantities transformation
2. Impact on choosing main ingredients and minor ingredients is effected not only by weight but also by flavor
3. Data quality (repeat among regions)