A Tool for Network Modelling and Analysis

Background

- The dataset is about Traditional Chinese Medicine
- A prescription is a certain combination of herbs
- Visualise the prescription ,herbs and relationship between them

Raw Data Set

x_0	x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	x_9	o
0	0	0	0	0	0	0	0	1	0	**1**
1	0	0	0	1	1	1	0	1	1	**1**
0	0	0	0	0	1	1	0	0	1	**1**
1	1	1	1	0	1	1	0	0	0	0
1	0	1	1	0	0	1	1	0	0	0
1	1	1	1	0	0	0	1	0	0	**1**
0	1	0	0	0	1	0	1	0	0	0
0	0	1	1	0	1	1	0	1	1	0
0	0	1	0	1	1	1	1	0	0	**1**
1	1	1	0	1	1	1	0	0	0	**1**

OFF SET

ON SET

- Each row is a set of variables (herbs) as well as outcome denoting if the set lead to a positive treatment or not
- In column X0-X9,"0" denotes the variable do not present while "1" denote it present
- The last column denote the outcome

Dataset after some boolean reduction which is equivalent to the raw dataset in terms of mathematic

~VAR1•~VAR5•~VAR34•~VAR35•~VAR39•~VAR113•~VAR200•~VAR236•~V
AR241•~VAR242

~(太子参)•~(百合)•~(黄连)•~(黄芩)•~(莲子心)•~(生地黄)•~(生甘草)•~(知母)•~(牡蛎
)•~(川芎)

VAR175•VAR237

(山药)•(炒酸枣仁)

VAR40•~VAR112•~VAR210•~VAR238

(石菖蒲)•~(浮小麦)•~(法半夏)•~(柴胡)

~VAR76•**VAR117**

~(竹茹)•(陈皮)

~VAR151•~VAR178•~VAR235•**VAR236**•**VAR237**•~VAR242

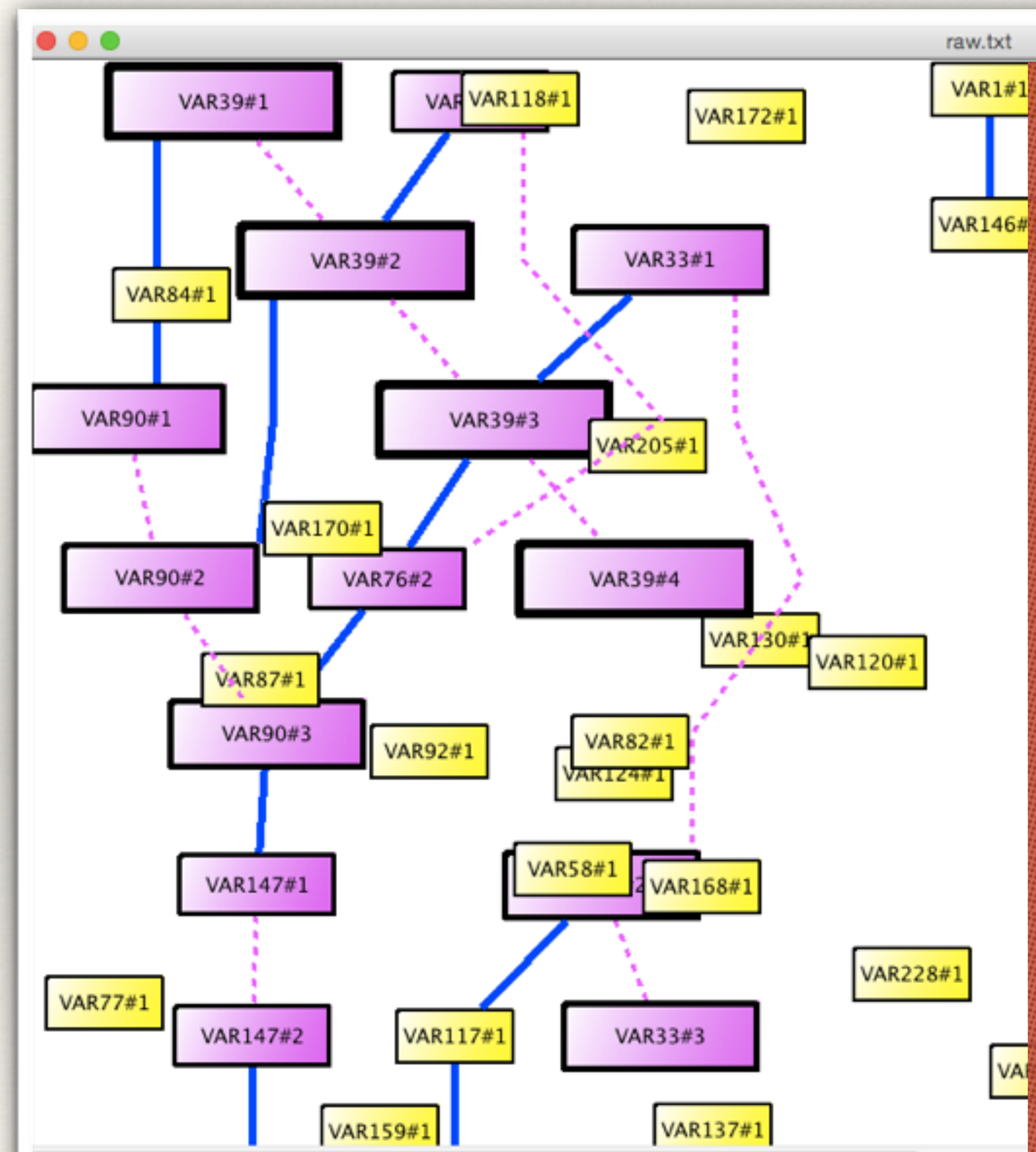
~(煅紫贝齿)•~(炒枳壳)•~(制远志)•(知母)•(炒酸枣仁)•~(川芎)

Real dataset to be visualised

- Each line is a implicant contains a set of variables.
- Variables can be either positive or negative
- Negative variable do not need to be visualise.
- A variable can present in multiple implicants
-

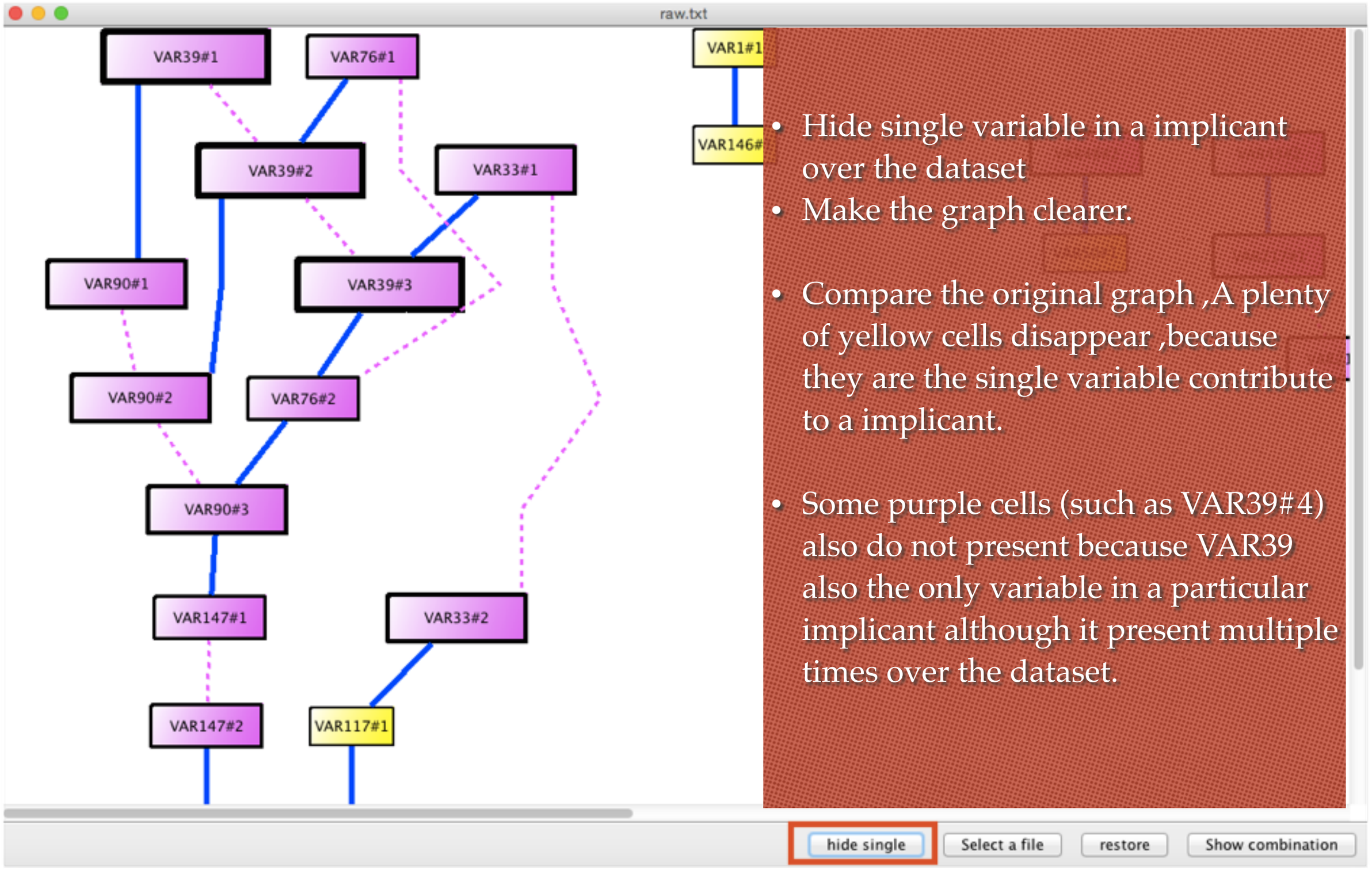
```
~VAR8VAR181
VAR9VAR239
~VAR13~VAR15~VAR17~VAR19~VAR21~VAR
VAR17VAR113
~VAR17~VAR21~VAR28VAR35~VAR37~VAR4
~VAR17~VAR21~VAR37~VAR42~VAR47~VAR
~VAR19~VAR28~VAR38~VAR90~VAR92VAR1
VAR21VAR89
~VAR21~VAR28~VAR37~VAR42~VAR47~VAR
~VAR21~VAR37~VAR42~VAR49~VAR77~VAR
~VAR21~VAR37~VAR49~VAR92~VAR112~VA
~VAR21~VAR37VAR82~VAR92~VAR118~VAR
VAR37
```

Overview of the program



- If the variable present in *only one* implicant ,the colour is yellow .Otherwise,it will to be pink
- Variables are also differentiated by size and the thickness of border. The more times the variable present in different implicants ,the size is larger and the border is thicker.
- Variables in same implicant are linked by solid blue line.
- If the variable present multiple time over the dataset,the same variable belong to different implicant are linked by dashed pink line.And the variable name is suffix by a hash tag (#) followed by a counter indicating the time it present

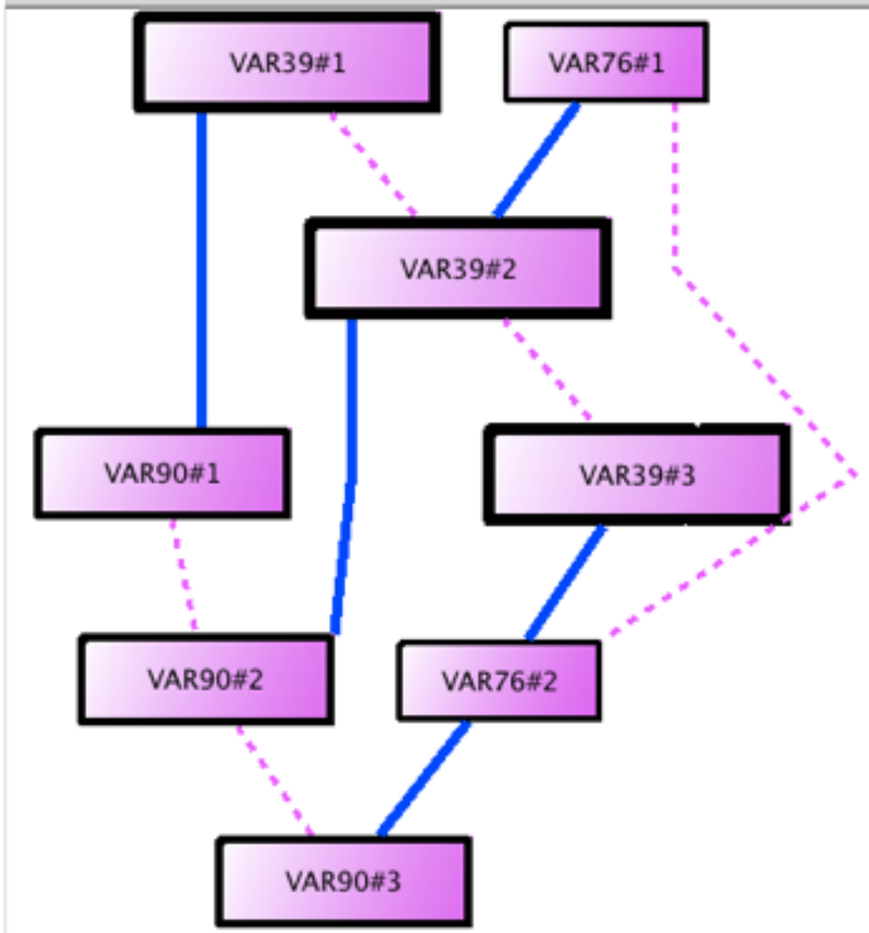
Click “hide single” button



- Hide single variable in a implicant over the dataset
- Make the graph clearer.
- Compare the original graph ,A plenty of yellow cells disappear ,because they are the single variable contribute to a implicant.
- Some purple cells (such as VAR39#4) also do not present because VAR39 also the only variable in a particular implicant although it present multiple times over the dataset.

Click “show combination” button

raw.txt



- Sometimes, user maybe interest in the variable combination rather than individual variables.more specifically,user want to inspect which **variable combination** present multiple times .

- After click, only **combinations** appearing in multiple implicants present.

hide single | Select a file | restore | Show combination

Click “select a file button”