

Dependency Analysis Tool

System requirements

- matplotlib==3.8.0
- numpy==1.26.1
- igraph==0.11.2

Installation

To install any required packages, you can simply run this code:

```
pip install -r requirements.txt
```

Configuration

In the *config* directory, you can find the [config.py](#) file.

In this file, you can modify input and output directories, printing and exporting options, and labels in graphs.

How to Run

To run this program, open terminal in the same directory as [dat.py](#) and execute this code:

```
python dat.py
```

Output:

```
[USAGE]: dat.py <filename1> <filename2> ...
```

Testing

To test this program with sample data, you can run program with these arguments:

```
python dat.py test1 test2
```

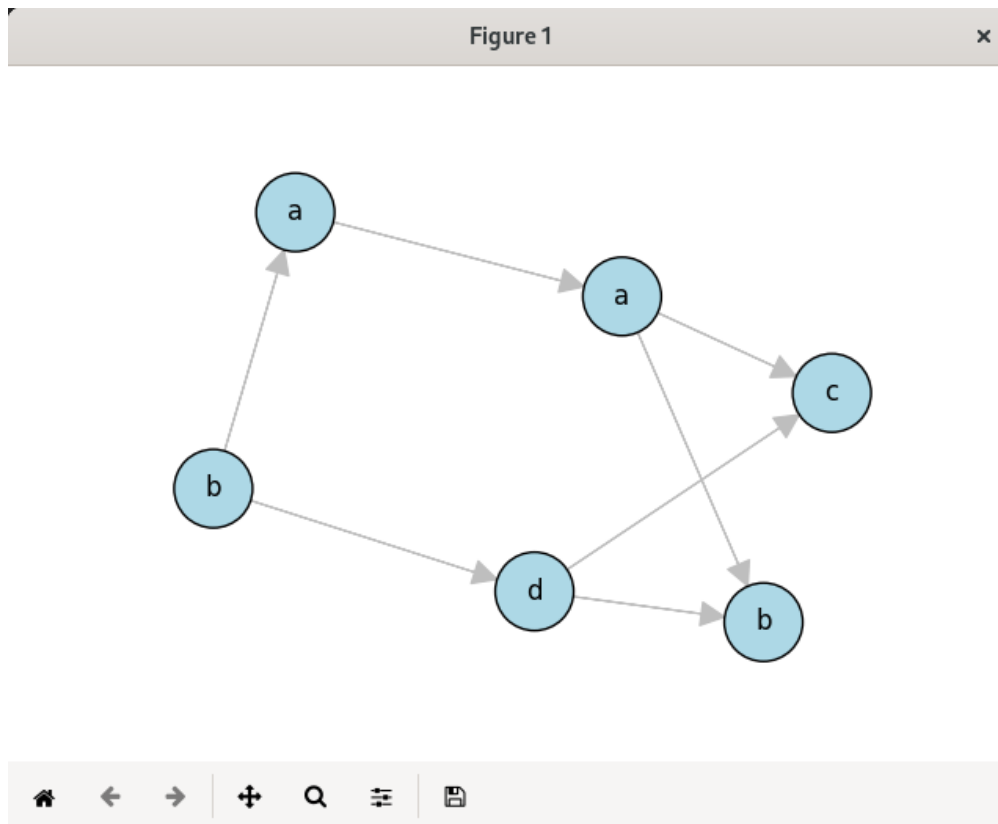
Output:

```
test1:
D = {(a, a), (a, b), (a, c), (b, a), (b, b), (b, d), (c, a), (c, c), (c, d), (d, b), (d, c), (d, d)}
I = {(a, d), (b, c), (c, b), (d, a)}
FNF([w]) = (b)(ad)(a)(bc)

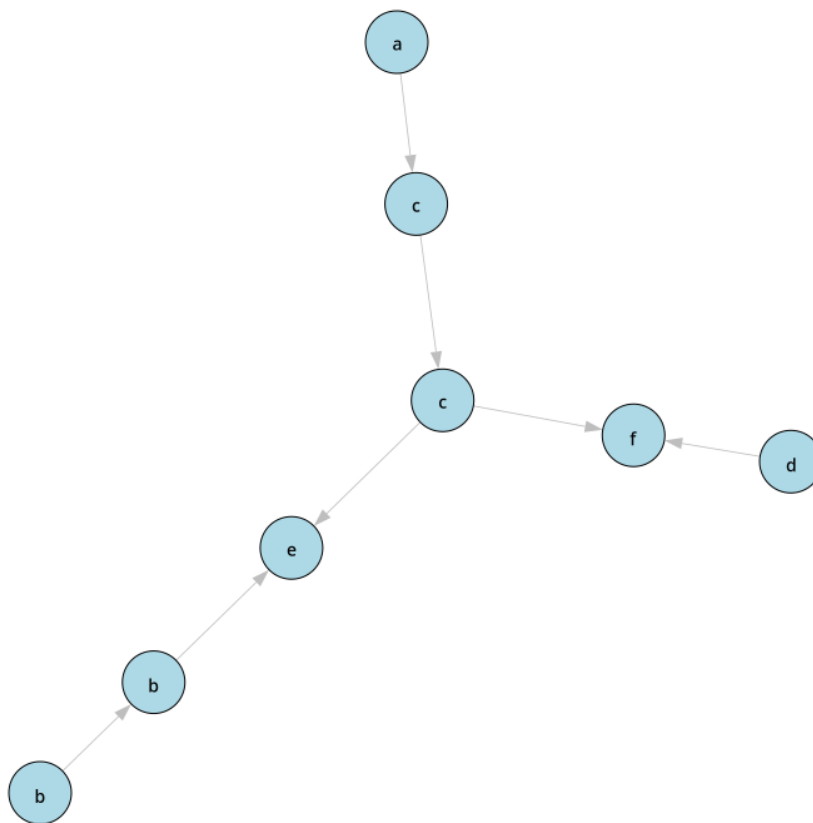
test2:
```

$D = \{(a, a), (a, c), (a, f), (b, b), (b, e), (c, a), (c, c), (c, e), (c, f), (d, d), (d, f), (e, b), (e, c),$
 $I = \{(a, b), (a, d), (a, e), (b, a), (b, c), (b, d), (b, f), (c, b), (c, d), (d, a), (d, b), (d, c), (d, e),$
 $\text{FNF}([w]) = (abd)(bc)(c)(ef)$

Result window with a plot for input *test1*:



Saved plot as PNG image in *output* directory for input *test2*:



The program can also save the result graph in a *.dot* file.

Input syntax

The input file must follow these rules:

- The first line is reserved for the definition of **alphabet A**.
- The second line is reserved for the **word (trace) w**.
- The rest of the lines can represent a set of **transactions on variables**.

Alphabet A

```
A = a
```

or

```
A = a, b, c ...
```

Action symbols in the alphabet **A** must be **lowercase or uppercase letters** from the English alphabet.

Word w

```
w = abbd...
```

Action symbols in **w** must belong to the alphabet **A**.

Transactions

```
a: x = 2x - 1
b: y = y1 + y2
c:
```

Action symbols must belong to the alphabet **A**.

Variables must contain one **lowercase letter** from the English alphabet and may have a **single digit** after the letter.

Transaction may be not defined (empty).

All sample transactions above are correct.