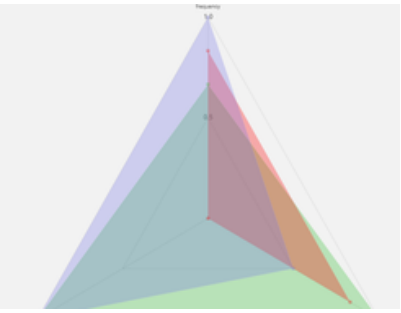
User guide - Project Skypattern



Installation

Requirements

- Java v12 or greater
- NodeJS v14 or greater (for build or server deployment, included in the .exe)

Run project locally

Use this part to install the dependencies and the project on a server to use it.

```
npm install # Fetch dependencies
```

Run with source code

Webapp (from the project root)

```
npm run serve # Compiles and hot-reloads for development
```

```
or
```

```
npm run build # Compiles and hot-reloads for development
```

Api (from project root/src/api)

```
node index.js
```

Run as desktop application

Install the compiled Electron app as and .exe or compile it yourself

Install the compiled app

Browse at https://sourceforge.net/projects/skypatterns/

Windows

Just run the .exe installer, and you're done!

The app resources will be stored in:
`C:\Users\Username\AppData\Local\Programs\skypatterns\resources`

Linux

Download then install the package with snap:

```
sudo apt install snap
```

```
snap install skypatterns_0.7.5_amd64.snap --dangerous
```

The app resources will be stored in:
`/var/lib/snapd/snap/skypatterns/x1/resources`

Compile the Electron app

```
npm install # Fetch dependencies
```

then

```
npm run electron:serve # Compiles electron app for development
```

or

```
npm run electron:build # Compiles electron app for production
```

Project files

Source code

Webapp

```
.
├──dist_electron       # Electron build
├──node modules        # Installed dependencies
├──public              # Global ressources
├──src
|   ├──api             # See [Api] below
|   ├──assets          # Project ressources
|   ├──plugins
|   ├──components      # |
|   ├──router          # |
|   ├──services        # | Webapp code
|   ├──store           # |
|   └──views           # |
```

Api

```
api
├──data
|   └── status.json    # Projects infos
├──config
|   ├── noclasses.json # Datasets noclass
|   └── colors.json    # Colors for the graphs display
├──datasets            # Input datasets
├──results             # Outputs from skypattern.jar
├──routes              # Api code
├──index.js            # Entry point (run with: node index.js)
├──skyppatern.jar      # Data mining program
```

Compiled app

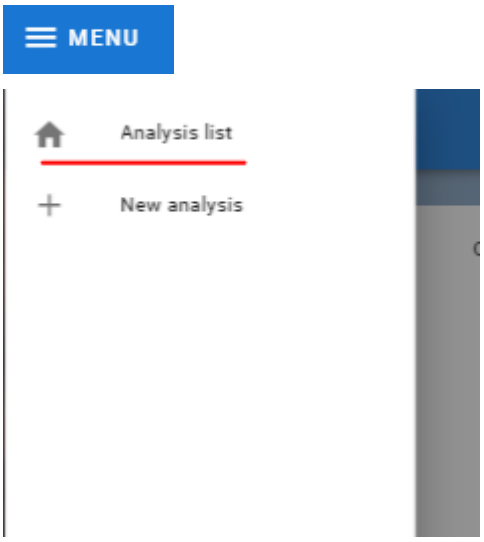
```
.
├──locales
├──ressources
|   └── api         # See [Api] above
├──skypattern.exe   # App launcher
```

Display a result

Access to the page with the analysis list

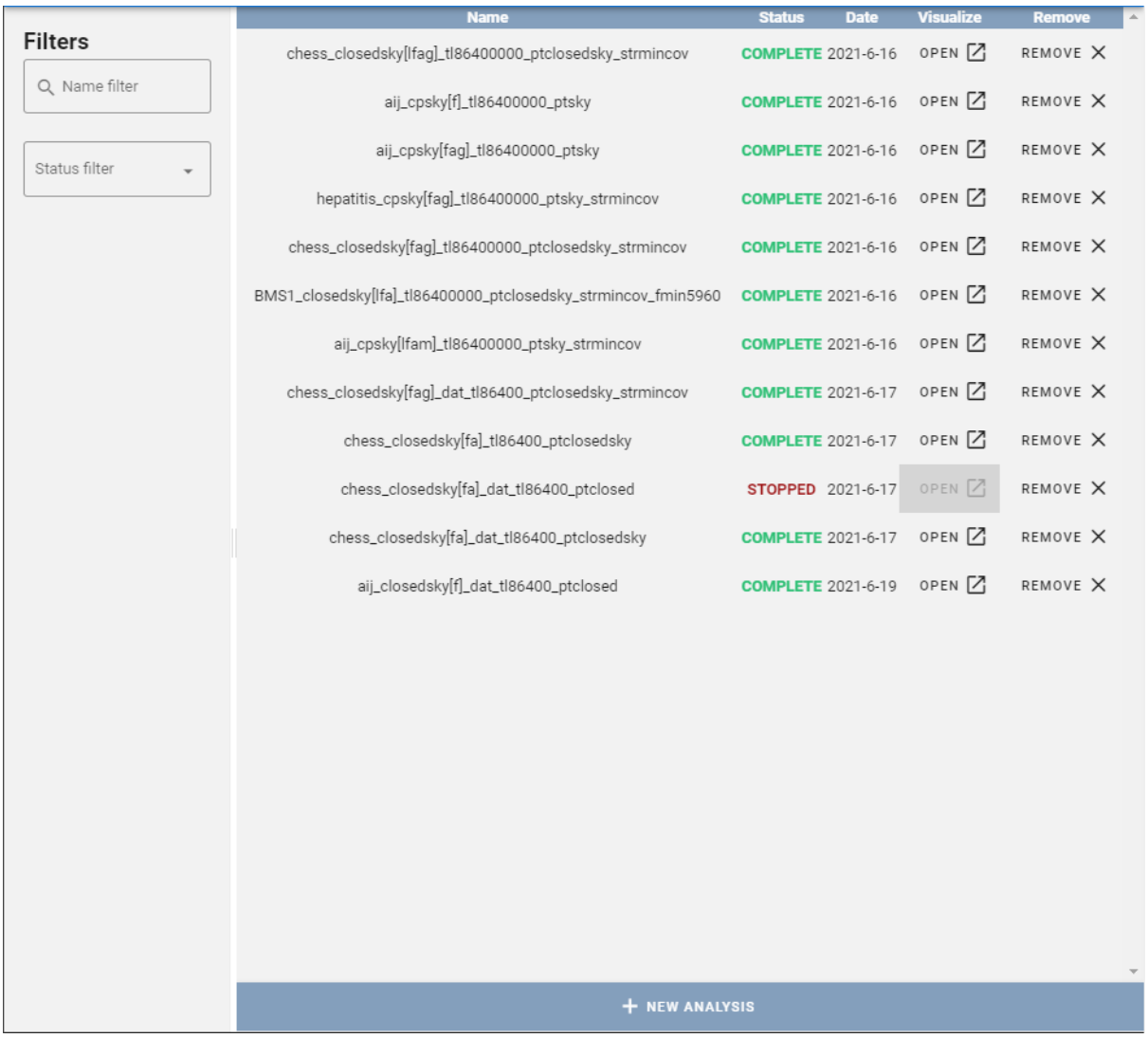
The page with the analysis list is the main page of the application. You can go there by clicking on the main title:

… or by the menu with the link “Analysis list”.



List the analysis

The main page contains the analysis list and some parameters for sorting. You can slide with the two panels to adapt the size.

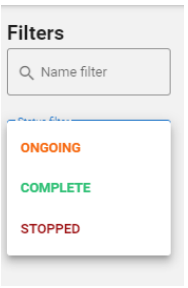


For the list, each line contains :

- the name of the calcul with the parameters
- the status of the calcul (“COMPLETE” if it is complete, “STOPPED” if the calcul run out because of the limit time, “ONGOING” if the process is still working)
- the date of the analysis
- a column with the possibility of removing the analysis of the list and of the stockage
- for the analysis completed, a button for access to the display

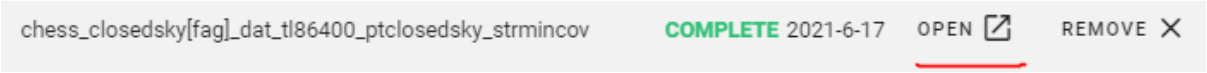
You can use two filters with that :

- one on the name of the analysis
- one with the selection of one or more status

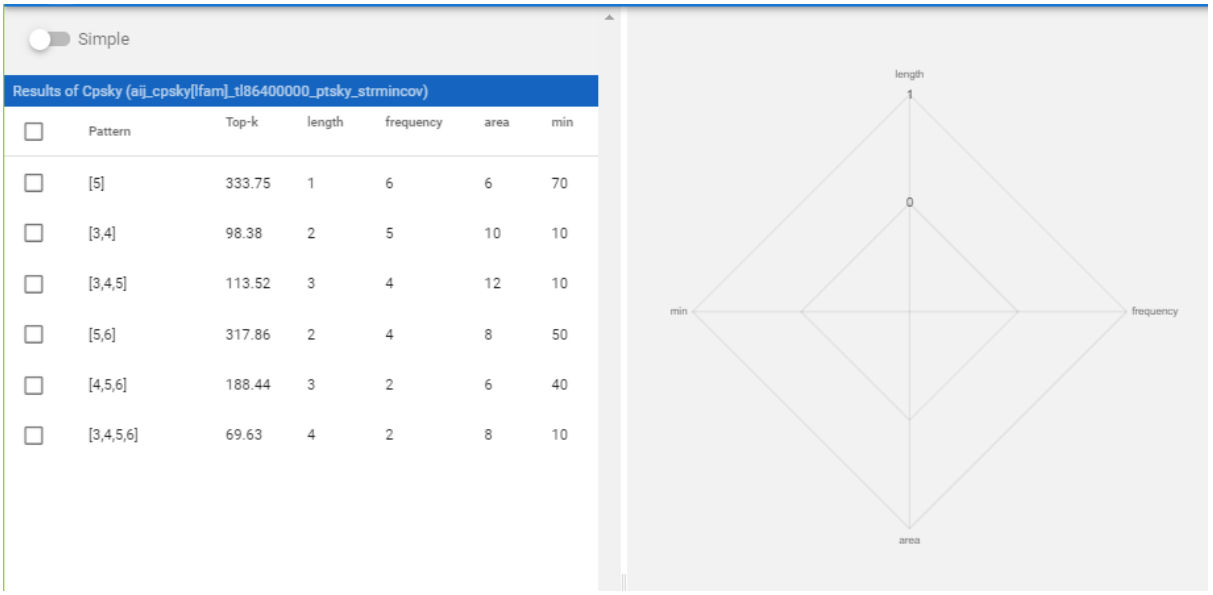


Visualize an analysis

For the analysis completed, you can click on the button “OPEN” to access the Visualization page.



On this page there are also two panels, one for the list of patterns for one analysis and the other for the display.

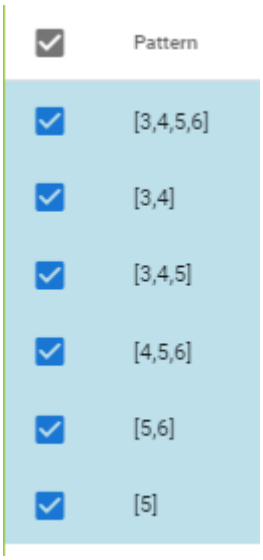


For the panel with the patterns list; each line is composed of :

- a square to indicate if it is selected or not (you can select by clicking on the line)
- the name of the pattern or the group of pattern
- the top-k, which is the area calculated (with absolute value)

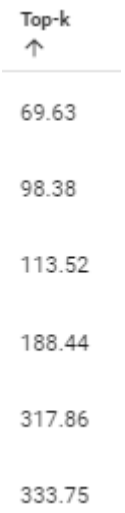
… and also each selected metric for the analysis:

- length
- frequency
- area
- growth-rate

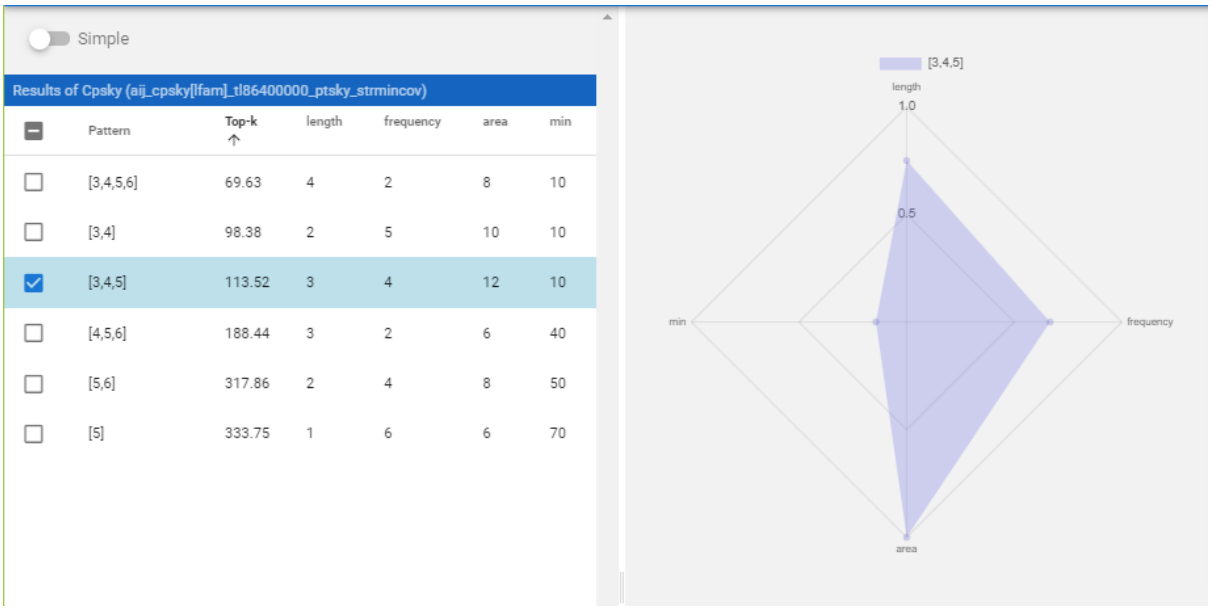


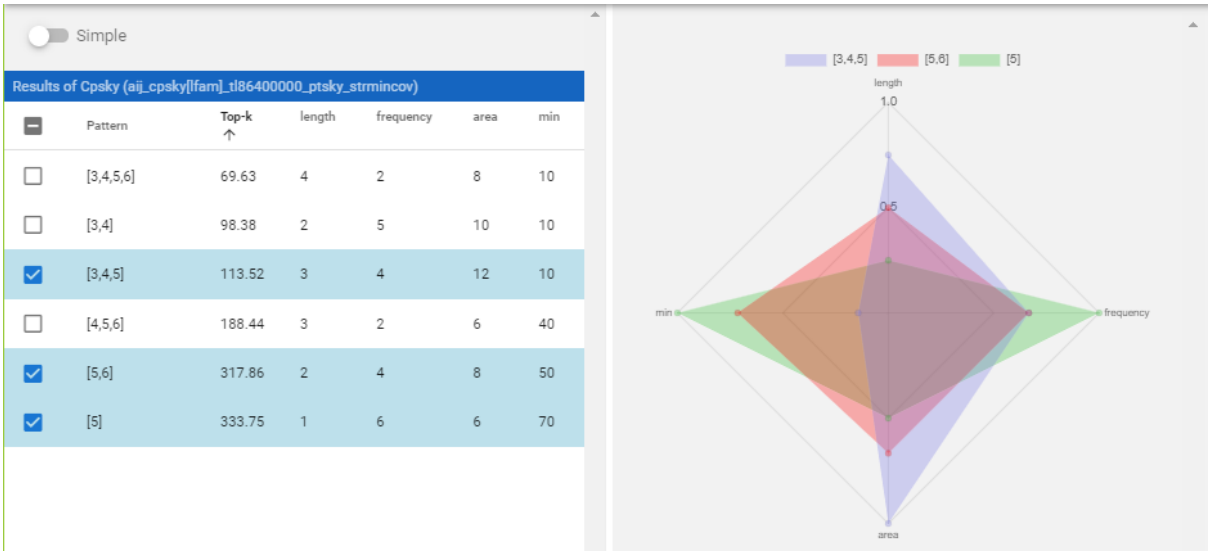
You can select all the lines with the square icon on the top.

You can use some of the parameters to sort on the value, by using the different column titles.You also can change the number of lines displayed with the selector on the bottom.

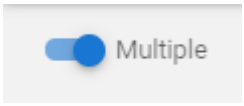


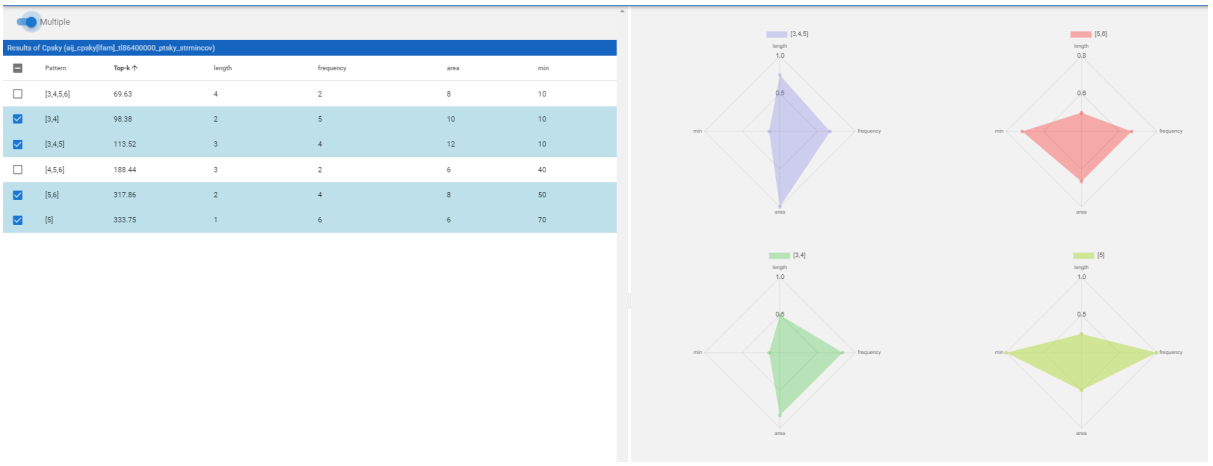
When you select one pattern by clicking on the line, it is displayed at the right on a radar chart. You can select one or more patterns to be displayed, and they will be superimposed on the chart.





You can split the selection with one chart by pattern, by using the slider and passing from “Simple” to “Multiple”.



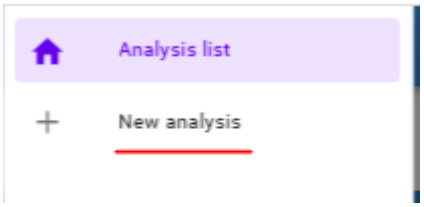


Create a new analysis

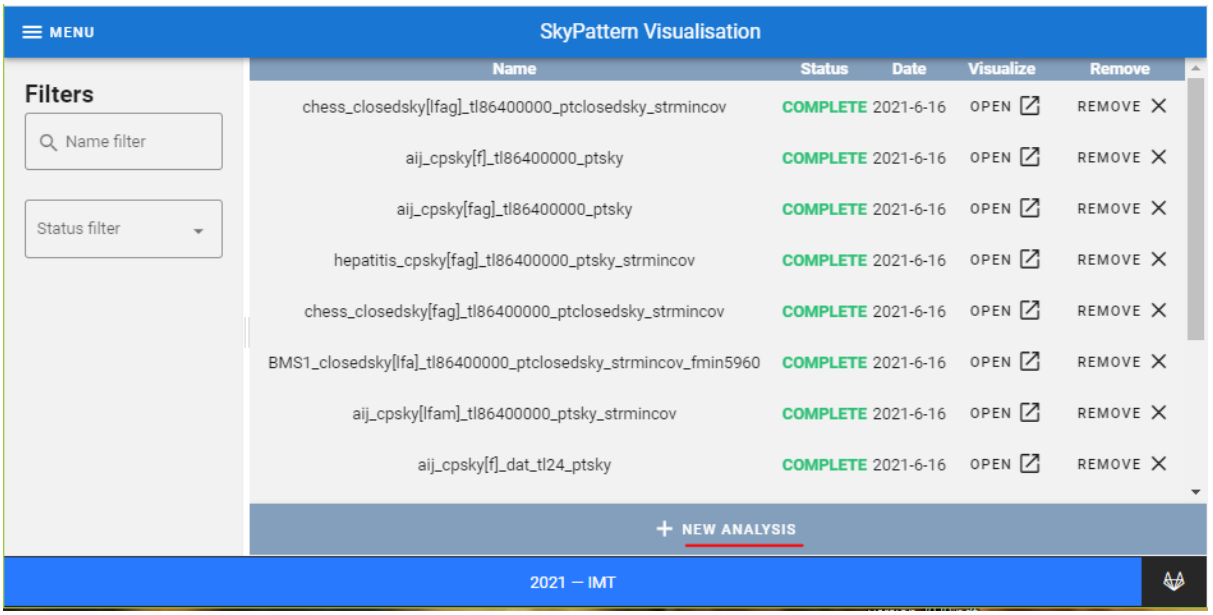
You can create a new analysis by choosing some parameters before launching a calcul and saving the results.

Access to the creation page

There are two access points to the creation page.
You can pass by the main menu by clicking on “New analysis.

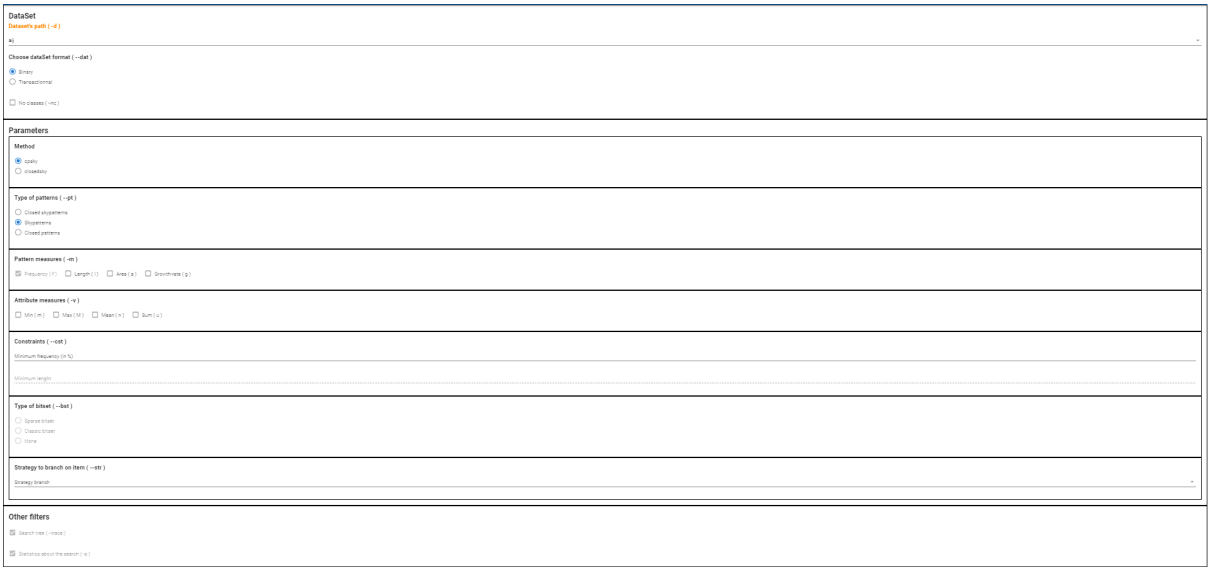


Or you can pass by the main page with an analysis list, and click on the button “New analysis” at the bottom of the page.



Selection of the parameters

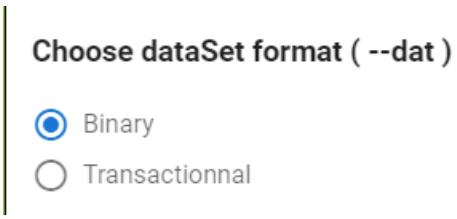
The page is composed of different blocks of parameters to select to create the analysis. Some of them are locked, because they are always needed or they are incompatible with other previous parameters.



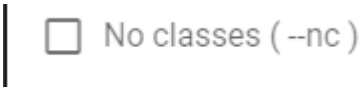
Dataset parameters

Dataset's path (-d)
List of the dataset availables for the analysis.

Dataset format (--dat)
By default, the dataset is in binary format.

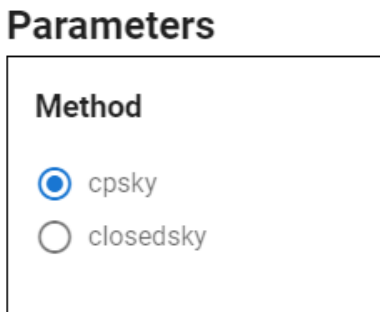


No classes (--nc)
If classes of transactions should not be taken into account, you can specify the option.

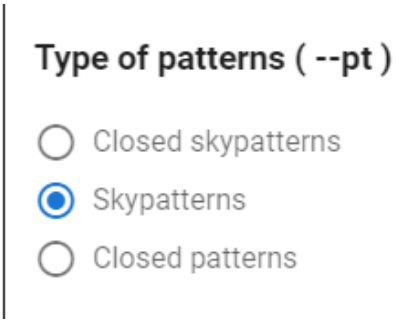


Pattern parameters

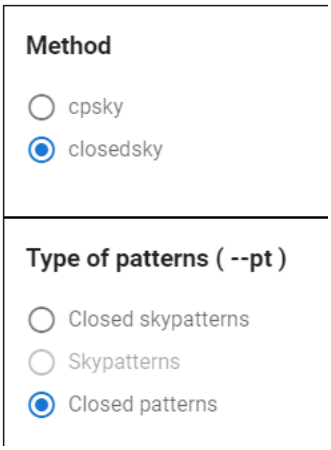
Method
Choose *cpsky* to use CP+SKY or *closedsky* to use ClosedSky global constraint
If you choose *closedsky*, you can modify the --bst but you can't select Skypattern for --pt.



Type of patterns (--pt)
You can choose 3 types of patterns :
- closed skypatterns : **closedsky** (default)
- skypatterns : **sky** (not available with closedsky subcommand)
- closed patterns : **closed**
Option skypatterns is blocked if you use the closedsky method.



If you use closedpattern, you can't choose pattern measure (-m) other than frequency and only Min and Max are available for the attribute measures (-v).



Pattern measures (-m)

Frequency is forced to be selected. Otherwise, you can add the area, the length and the growth-rate as attributes.

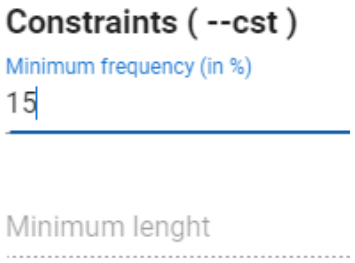
If you choose lenght, you can change the value in the parameter --bst. If you choose area or growth-rate, attribute value will be calculated with the frequency.

Attribute measures (-v)

The following ones are available : m (min), M (max), n (mean), u (sum).

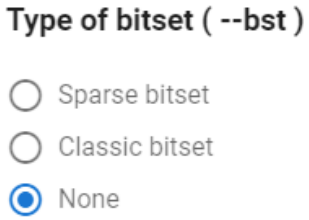
If a closed pattern is selected as --pt, you can't select n or u. If you select Mean or Sum, and next you change the --pt to Closed pattern, the two options are unselected.

Constraints (--cst)
You can specify a constraint for the minimum frequency (in percentage) or the minimum length (in absolute value). If you don't choose a value, it is set at 1 by default.



For the length, you can modify the value if you Length is selected in pattern measures (-m). If you use a Closed skypattern as --pt, you can't use this attribute.

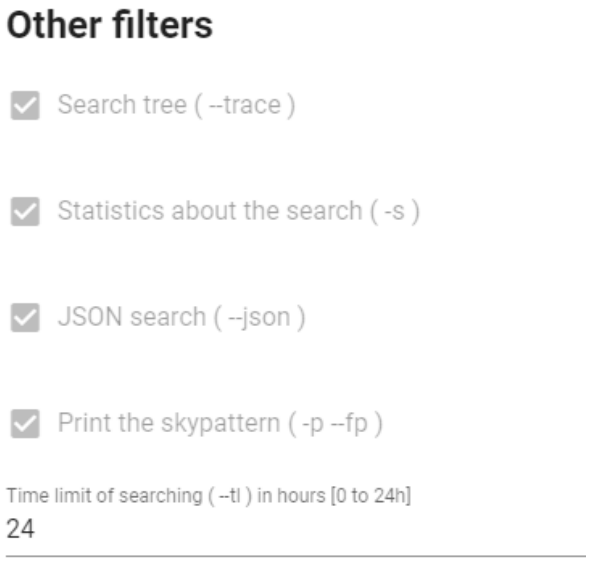
Type of bitset (--bst)
If you use a closedsky command, you can choose a type of bitset or not. 2 options are available, a sparse or a classic bitset; if you don't want to use this option, you can choose None as a value. If you change the command to cpsky, the value is changed at None.



Strategy to branch on item (--str)
You can choose a strategy in the list :

- occ : it chooses the not instantiated variable with the greatest number of not-entailed propagators (default for CP+SKY)
- (min|max)freq : it chooses the not instanciated variable with the lowest (resp. greatest) frequency (minfreq is the default for ClosedSky)
- (min|max)val : it chooses the not instantiated variable with the lowest (resp. greatest) val0
- (min|max)norm : it normalises item frequency and values between 0 and 1, computes average between them and chooses the not instantiated variable with the lowest (resp. greatest) average value
- inpord : it chooses variable with respect to their order

Time limit (--tl)
You can specify a time limit between 0 and 24h. If you write a wrong value, this will be corrected directly.
If the operation is not achieved when the time is down, the analysis will be stopped and displayed with the state "UNCOMPLETED"



Validation

You can complete the creation with the button at the bottom of the page.
You will be redirected to the main page and the new analysis is added to the list, with the state “ONGOING” or “COMPLETE” if it is quick.