The **nl-interval** package

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Abstract

This is a LaTeX package that aims to simplify and agilize the process of representing intervals in the real axis. Four commands are provided: `\nlAxisX`, `\nlnuminf`, `\nlinfnum` and `\nlnumnum`, they were built around the packages **tkz-fct**, **ifthen** and **xparse** and require being used inside a `tikzpicture` environment.

1 How to use

1.1 How to load the package

The package is loaded as usual, through the command

```
\usepackage{nl-interval}
```

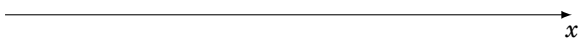
There are, at this time, no options available to include here.

1.2 The commands

The first command is `\nlAxisX` and it simply draws the x axis where the intervals are going to be represented. It has two mandatory inputs: the minimum and maximum of the axis, so, the full instruction is: `\nlAxisX{min}{max}`:

```
\begin{tikzpicture}
        \nlAxisX{-2}{5}
\end{tikzpicture}
```

would give the output:



After the axis is drawn, one can start placing the intervals. To do this we will consider two kinds of intervals, the ones with infinity, either $-\infty$ or $+\infty$ and the ones with two numbers.

Let's start with the first group.

- `\nlinfnum` will draw intervals of the kind: $]-\infty, number]$ or $]-\infty, number[$.
- `\nlnuminf` will draw intervals of the kind: $[number, +\infty[$ or $]number, +\infty[$.

These two commands also have two mandatory inputs: first one is the number (*always a decimal representation, so, something like π doesn't work but there is a workaround!*) and the second if it's an o̲pen or c̲losed interval at the number. So, for instance

```
\begin{tikzpicture}
        \nlAxisX{-2}{5}
        \nlnuminf{3}{o}
        \nlinfnum{1}{c}
\end{tikzpicture}
```

gives us

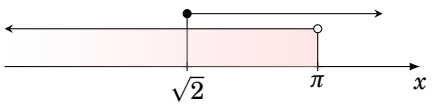
This time, there are a few optional inputs, the full commands are like this:

```
\nlnuminf[1]{number}[2]{o or c}[3]
\nlinfnum[1]{number}[2]{o or c}[3]
```

- in [1] you can put options like different colours or patters used;
- in [2] you can substitute the number for a letter or an exact representation of the number, don't put it in math environment!;
- in [3] you can change the height of the interval, which is 0.5cm by default.

Let's try some of these options:

```
\begin{tikzpicture}
        \nlAxisX{-2}{5}
        \nlnuminf[pattern=north west lines]{1.4142}[\sqrt{2}]{c}[.7]
        \nlinfnum[red!20]{3.1416}[\pi]{o}
\end{tikzpicture}
```



The second group of intervals, works with a single command:

- `\nlnumnum`

and, since it uses two numbers, we have four mandatory inputs: the numbers and the instruction of closed or open. It works like this:

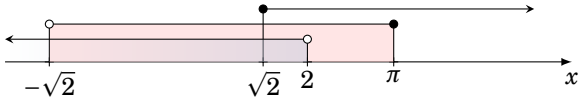
```
\begin{tikzpicture}
        \nlAxisX{-2}{5}
        \nlnumnum{-1}{o}{3}{c}
\end{tikzpicture}
```

As with the previous commands, there are a few options, this time we have one more which allows us to change what is shown in the second number:

```
\begin{tikzpicture}
        \nlAxisX{-2}{5}
        \nlnumnum[red!20]{-1.4142}[-\sqrt{2}]{o}{3.1416}[\pi]{c}
\end{tikzpicture}
```

2 Conclusion

This is a really simple package (my first attempt at a package) but one that, I hope, can help you draw stuff like:



somewhat quickly and easily. By the way, the instructions for this are:

```
\begin{tikzpicture}
        \nlAxisX{-2}{5}
        \nlnumnum[red!20]{-1.4142}[-\sqrt{2}]{o}{3.1416}[\pi]{c}
        \nlnuminf[pattern=north west lines]{1.4142}[\sqrt{2}]{c}[.7]
        \nlinfnum{2}{o}[.3]
\end{tikzpicture}
```