A quick start to using Oscar

Oscar is written in julia

$\Longrightarrow$ we need to start julia

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```
$ julia
                                _
    _       _ _(_)_     |  Documentation: https://docs.juli
   (_)     | (_) (_)    |
    _ _   _| |_  __ _   |  Type "?" for help, "]?" for Pkg
   | | | | | | |/ _` |  |
   | | |_| | | | (_| |  |  Version 1.10.10 (2025-06-27)
  _/ |\__'_|_|_|\__'_|  |  Official https://julialang.org/
 |__/                   |

julia>
```

That was quick!

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Starting Oscar – Step 2: OSCAR

```
julia> using Oscar
.....
```

This takes a while.

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Starting Oscar – Step 2: OSCAR

```
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```

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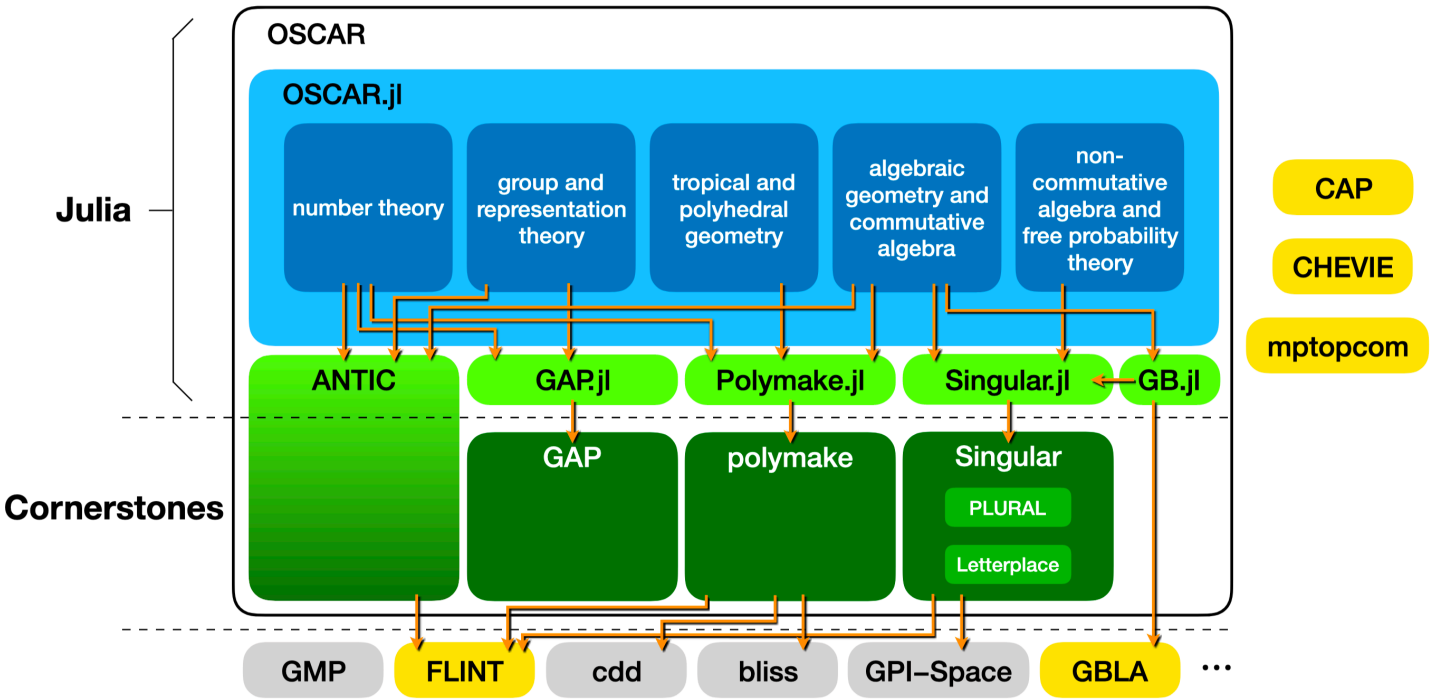
```
...
  ___    ____    ____      _     ____
 / _ \  / ___|  / ___|    / \   |  _ \    |  Combining ANTIC, GAP
| | | | \___ \| |       / _ \  | |_) |   |  Type "?Oscar" for mo
| |_| |  ___) | |___   / ___ \ |  _ <    |  Manual: https://docs
 \___/  |____/ \____| /_/   \_\|_| \_\   |  1.3.0-DEV #res_CJS 8

julia>
```

Now we are all set!

What is Oscar?

http://oscar-system.org/



Finding help on your own

Structured documentation online (constantly evolving):
https://www.oscar-system.org/documentation/

If you have a guess, what a function might be called:

- enter the guessed function name with a '?' in front of it
- use tab-expansion to explore potential function names
- use '@less ' followed by a call to a function to see the code, which will be run by the command

Now its your turn!

Baby Task one:

Verify

$$\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$$

for at least 5 natural numbers n of your choice.

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Baby Task two:

Create a list of all primes up to 500 by implementing the sieve of Eratosthenes.
(i.e. successively dropping the multiplies from the list)

And yet some more!

Baby Task three:

Verify in two different ways that

$$x^7 - x = \prod_{i=0}^{6}(x - i) \in \mathbb{F}_7[x].$$

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Baby Task four:

Consider the Klein 4-group V as a subgroup of the symmetric group Sym_4 and verify the theorem of Lagrange

$$|Sym_4| = |Sym_4 : V| \cdot |V|$$

And yet some more!

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By the way: what properties of V can you directly check with Oscar?