Homework 2

1. Try out the vanity bitcoin address example at asecurity or the Ethereum version

2. What do you understand by

   1. O(n)
   2. O(1)
   3. O(log n)

3. Which of those is best when describing a proof size

4. In your teams discuss why are there few identity projects on Starknet ?

5. In preparation for future lessons you need to install Protostar

See documentation and this useful medium article

Linux / Mac

1.

```
curl -L https://raw.githubusercontent.com/software-
mansion/protostar/master/install.sh | bash
```

2. Restart the terminal.
3. Run `protostar -v` to check Protostar and cairo-lang version.
   It adds to your PATH in .bashrc, you may need to move that line to .bash_profile If it
   doesn't find protostar.
   You may also need to update your version of git

Windows

Windows is not supported.
You can either use a linux environment or virtual machine in Windows,
or use gitpod :

I have set up an environment on gitpod, please make sure this works for you
Go to http://gitpod.io

and use the repo https://github.com/ExtropyIO/CairoBootcamp

or go direct to URL
https://gitpod.io/#https://github.com/ExtropyIO/CairoBootcamp

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To create a new project use

```
protostar init
```

This will give a directory structure similar to this

```
drwxr-xr-x  7 laurencekirk  staff  224 16 Jul 05:39 ./
drwxr-xr-x  3 laurencekirk  staff   96 16 Jul 05:39 ../
drwxr-xr-x  9 laurencekirk  staff  288 16 Jul 05:39 .git/
drwxr-xr-x  2 laurencekirk  staff   64 16 Jul 05:39 lib/
-rw-r--r--  1 laurencekirk  staff  148 16 Jul 05:39 protostar.toml
drwxr-xr-x  3 laurencekirk  staff   96 15 Jul 10:03 src/
drwxr-xr-x  3 laurencekirk  staff   96 15 Jul 10:03 tests/
```

Configuration

This is specified in the .toml file

```
["protostar.config"]
protostar_version = "0.4.2"


["protostar.project"]
libs_path = "./lib"          # a path to the dependency directory


# This section is explained in the "Project compilation" guide.
["protostar.contracts"]
main = [
  "./src/main.cairo",
]
```

Compiling your programs / contracts

once you have specified the contracts in the protostar.toml file, run

```
protostar build
```

to compile them.

Deploying your programs / contracts

You need to specify the path to the compilation results.

```
$ protostar deploy ./build/main.json --network alpha-goerli
```

Testing your programs / contracts

Protostar will find the test file using its name, checking if it begins with `test_` prefix, and has `@external` functions, which names begin with `test_` .

A test looks like

```
@external
func test_sum{syscall_ptr : felt*, range_check_ptr}():
    let (r) = sum_func(4,3)
    assert r = 7
    return ()
end
```

You can run the tests, specifying the test directory

```
protostar test ./tests
```