Exercises - Ethereum Smart Contracts

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1. Practice with GASTAP

The tool GASTAP `https://costa.fdi.ucm.es/gastap/` is a static analysis tool that allows you to compute upper-bound estimations of the gas consumption of a contract.
To analyze a contract you have to follow these steps:

1. Copy the code on GASTAP central panel and press **Refresh Outline**.
2. Then Select one function on the right and press **Apply**.
   Note: Analyze the contract functions one by one.
3. The results of GASTAP are showed on the bottom panel. In some cases you have to scroll down that panel to see all results.

1.1. Contract 1

Given the contract in file `ex1.sol`, answer the following questions:

1. Compute upper-bounds of the gas consumption of each function using Remix and GASTAP and interpret (explain) the results obtained.
2. Do you think a tool like GASTAP can be useful for contract development? Explain your answer.

1.2. Contract 2

Given the code in file `ex2.sol`:

1. Analyze it with GASTAP and obtain its opcodes upper-bound (UB).

2. Could we change the Solidity code of function `powers` to reduce the number of accesses to storage? How? (use Solidity code only, and assume that the array might have any length.)

3. Analyze the optimized code and obtain its opcodes UB using GASTAP. Reason about the differences you see in the opcodes UB in the original contract with respect to the optimized contract.