# Subtractive lagged Fibbonacci generator

Subtractive lagged Fibbonacci generator uses the following equation to generate pseudo-random numbers:

$$x_n = x_{n-k} - x_{n-1} \mod M,$$

where $n \geq max(k, l)$. Values $x_1, \ldots, x_n$ are a seed for this generator. Value of $M$ must be a power of 2.

## 1 Input

- n – (int) determines how many values will be generated (default: 100),
- k – (int) sets the value of k in the previous equation (default: 100),
- l – (int) sets the value of l in the previous equation (default: 37),
- Mp – (int) value of $2^{Mp}$ will be set as M in the previous equation (default: 30),
- seed – name of a text file with one integer between 0 and M-1 in each line, number of lines in a file must be greater or equal to $max(k, l)$ (by default LCG generator ($a = 7^5$, $c = 0$) with current time as a seed is used to generate sufficient number of integers),
- output-file – name of the output file, when no name is given the values are printed to the screen (default: "").

## 2 Output

By default the values are printed to the screen. When a non empty name is given the program generates an output file in pickle format with the following key value pairs:

- PRNG – string with the name of the generator and values of k and l (as strings)
- Modulus – the value of $M$,
- n – number of values generated

- seed – (list) seed
- numbers – the values that were generated

# 3 Examples

```
python scripts_learn/fib_sub_gen.py --n 1000 --Mp 30 --k 100 --l 37 --seed seeds.txt
python  z1_ran_exc_var_test.py --output-file generated.pkl
```