# TD-TP Control

## *I. The first work is to read these parts in order to stand out the important points:*

a. « **The Algorithm Design Manual Second Edition** » -> How to Design Algorithms
b. « **Introduction to Algorithms Third Edition** » -> Advanced Design and Analysis Techniques -> Dynamic Programming
c. « **Introduction to Algorithms Third Edition** » -> Selected Topics -> Multithreaded Algorithms

## *II. The second work is:*

a. To choose one subject from this chapter « **Introduction to Algorithms Third Edition** » -> Selected Topics:

-> Matrix Operations:
- Solving systems of linear equations (Forward and back substitution)
- Solving systems of linear equations (Computing an LUP decomposition)
- Inverting matrices

-> Linear Programming:
- The simplex algorithm (Pivot)
- The simplex algorithm (Algorithm)

-> Polynomials and the FFT:
- Representing polynomials (Addition)
- Representing polynomials (Multiplication)

-> Number-Theoretic Algorithms:
- Elementary number-theoretic notions
- Greatest common divisor
- Modular arithmetic
- Solving modular linear equations
- The Chinese remainder theorem
- Powers of an element
- The RSA public-key cryptosystem
- Primality testing
- Integer factorization

-> String Matching
- The naive string-matching algorithm
- The Rabin-Karp algorithm
- String matching with finite automata
- The Knuth-Morris-Pratt algorithm

b. To make a small presentation of the subject in "**English**".

c. To program an example with a multi-language tool "**Python**" under "**Ubuntu**".

d. To apply "**advanced notions**" of the "**course**".

# Project deadline: 15-12-2018 à oo:oo

(Delays and copy-paste are penalized)

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