

Final Report of Design and Analysis of Algorithms 1/20-21

1. Reference

Introduction to
The Design and Analysis of Algorithms
(Levitin)

2. Content

2.1 Have learned/ to be learned

- a. Brute-force
- b. Divide-and-conquer
- c. Greedy Algorithms
- d. Dynamic Programming

2.2 Self study

- a. Decrease and conquer (5)
- b. Transform and conquer (6)
- c. Iterative improvement (4)
- d. Backtracking (4)
- e. Branch-and-Bound (3)
- f. Approximation Algorithms (2)

3. Content Requirements

3.1 Report (docx/tex) in Vietnamese, 3 algorithms **in the reference book** for each paradigm in 2.1, all algorithms **in the reference book** for just only one assigned (by your teacher) paradigm in 2.2 (for example, 2.2.a)

- a. Idea of algorithms
- b. Implementation in Python3 (do not take screenshot and paste) (comments required input/output description, purpose)
- c. Demo (generate inputs with different size, then draw the running time as a function of input size)
- d. Report your progress every week
- e. Self-evaluation.

Tips

```
>>> import pylab
>>> pylab.plot([1,2,3],[4,5,7])
[<matplotlib.lines.Line2D object at 0x7fa1901268d0>]
>>> pylab.show()
>>> pylab.plot([1,2,3],[4,5,7], 'o-')
[<matplotlib.lines.Line2D object at 0x7fa1904641d0>]
>>> pylab.show()
>>> import time
>>> time.time()
1602127586.55342
>>> time.time()
```

```
1602127588.896975
>>> a = time.time()
>>> z = time.time()
>>> z-a
5.0556700229644775
```

3.2 Presentation (pptx/tex) in English

- a. Idea of algorithms
- b. Pseudocode (do not take screenshot and paste) (comments required input/output description, purpose)
- c. Analysis of algorithms (Θ -notation, O -notation)

3.3 Present your works at class (15')

4. Deadline

To the penultimate (second last) day of the course.

Each week you must complete at least one algorithm (every week report your progress)