

DSAI 3202 – Parallel and distributed computing

Lab – 2: First Parallel Programs

1. Objectives:

- Build a first program using threads in Python.
- Build a first program using processes in Python.

2. Tasks

2.a. The sequential Case

- a. Make a function that randomly generates 1000 characters and joins them.
- b. Make a function that randomly generates 1000 numbers and adds them.
- c. Time the execution of the two functions.

2.b. Threading:

- a. Create a thread for each of the functions. Run them and time the execution.
- b. *Advanced work: Create two threads per function.*

2.c. Processes:

- a. Create a process for each of the functions. Run them and time the execution.
- b. *Advanced work: Create two threads per function.*

2.d. Performance analysis

- c. For each case, compute:
 - i. *The speedup,*
 - ii. *The efficiency,*
 - iii. *The speedups using Amdhal's Law,*
 - iv. *The speedups Gustaffson's Law.*

2.e. What are your conclusions?