

# TP 6: Mandelbrot Set : Load Balancing

December 11, 2023

## 1 Introduction

In this assignment, you will build upon the Mandelbrot set generation code developed in TP 5. The focus will be on exploring and implementing both static and dynamic scheduling techniques for load balancing.

## 2 Code Reuse

Reuse the Mandelbrot set generation code from TP 5 as the foundation for this assignment. Ensure that your code is well-documented and organized. You are required to submit two implementations with different scheduling strategies: one using static scheduling and the other using dynamic scheduling.

## 3 Static and Dynamic Scheduling

### 3.1 Static Scheduling

Explain the concept of static scheduling in parallel computing. Discuss how it works, its advantages, and potential limitations. Modify your Mandelbrot set generation code to incorporate static scheduling. Provide detailed explanations in your report.

### 3.2 Dynamic Scheduling

Similarly, explain the concept of dynamic scheduling, discussing its advantages and limitations. Implement dynamic scheduling in your Mandelbrot set generation code, and provide a comprehensive explanation of how it improves load balancing compared to static scheduling.

## 4 Load Balancing

Discuss the importance of load balancing in parallel computing. Elaborate on how both static and dynamic scheduling contribute to achieving load balance in the context of your Mandelbrot set generation code.

## 5 Execution Time Analysis

Run your code on three different regions of the complex plane. Record the execution times in three distinct regions and analyze the results. Include graphs or charts to visualize the performance differences between static and dynamic scheduling.

## 6 Submission Requirements

Submit the following items:

- Two sets of Mandelbrot set generation codes: one with static scheduling and one with dynamic scheduling.
- A Makefile to facilitate compilation and execution.
- A comprehensive report documenting your understanding of static and dynamic scheduling, load balancing, and the performance analysis of your implementations. Summarize your findings and reflect on the challenges and insights gained through this assignment.