Concurrency vs Parallelism

A Study in Programming Language Theory

Abstract

This paper examines the distinction between concurrency and parallelism in the context of Programming Language Theory (PLT). We demonstrate that these concepts are orthogonal and discuss their implications for concurrent program design.

1. Introduction

Concurrency is a language concept that deals with structuring programs as independent parts. Parallelism, on the other hand, is a hardware concept concerning the simultaneous execution of computations.

2. Key Differences

- Concurrency: About program structure and composition
- Parallelism: About simultaneous execution on hardware
- Orthogonality: One does not imply the other