

# Definitions Assignment - Bhawandeep Kambo

## Introduction

This is assignment 1:3 for english 301. In this assignment we were required to pick a term and provide three definitions for a specific audience in a set situation.

## Term

Instruction Pipelining

## Audience and Situation

First day of a introductory hardware and computing class. As an instructor, Bhawandeep, has to introduce the class to the concept of how a processor works and how it is optimized. As part of this process he has to give a definition of instruction pipelining.

## Parenthetical Definition

A set of instructions are often optimized through instruction pipelining (starting the next instruction before the first finishes) by the cpu.

## Sentence Definition

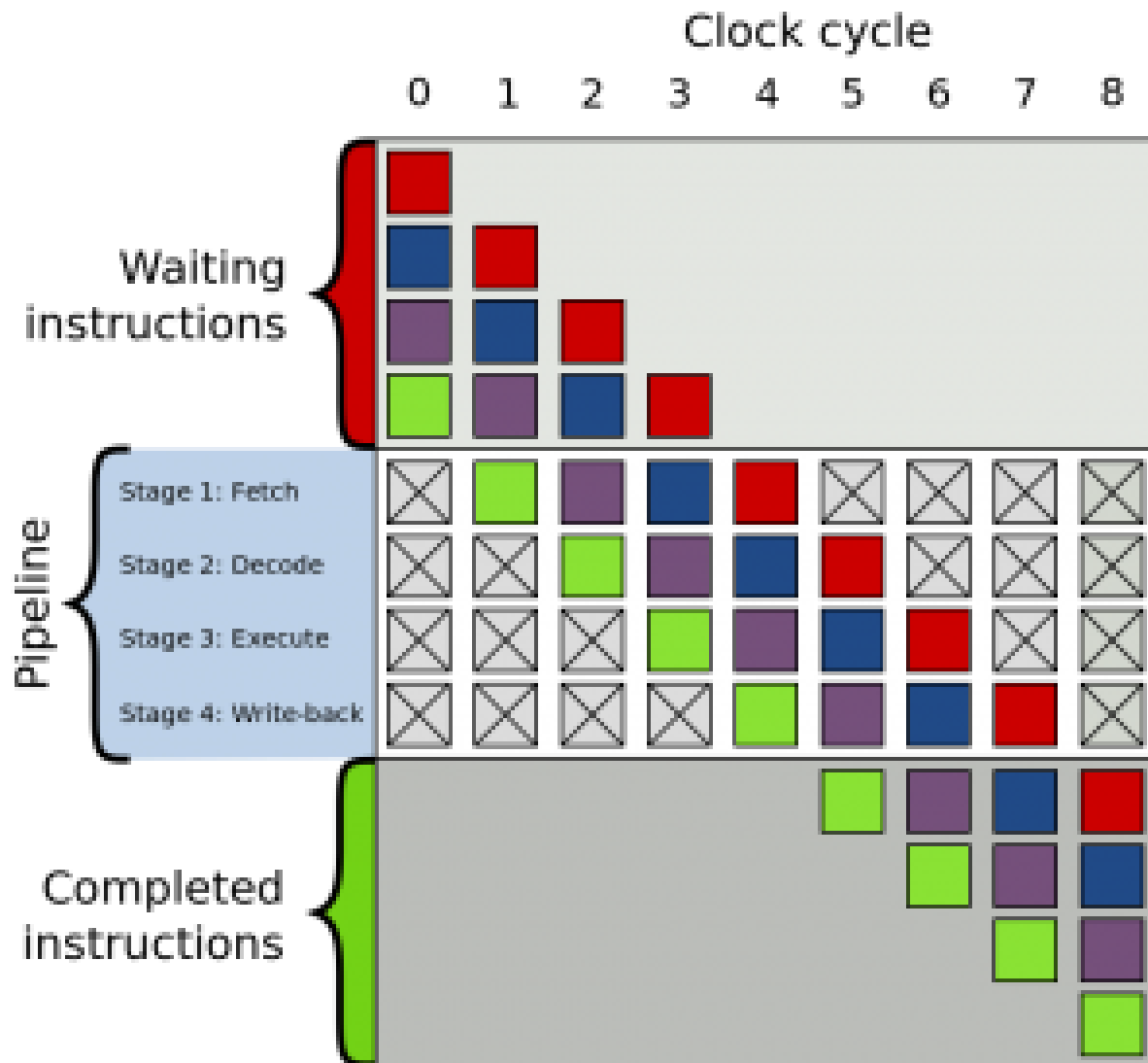
Instruction pipelining is the technique of optimizing how the cpu reads and executes instructions by starting a new instruction before the previous one is finished, saving time and using optimal hardware resources.

## Expanded Definition

Instruction pipelining is the technique of optimizing how the cpu reads and executes instructions by starting a new instruction before the previous one is finished, saving time and using optimal hardware resources.

A general instruction given to the CPU is made up of several stages: Fetch, Decode, Execute, Memory, and Write Back. In a traditional, non optimized, cycle the cpu goes through each of these stages one at a time and then once the instruction goes through the last stage is when the next instruction is started. This process is slow and requires a drastic amount of time while only using one specific part of the cpu's capabilities at a time leaving everything else idle.

The cpu uses instruction pipelining in a very ordered manner. Instead of moving a single instruction through the cpu stages one at a time, it optimizes the process by starting the next instruction as the previous instruction passes on to the next stage in the cpu pipeline. For example, once the first process finished the fetch stage and moves onto the decode stage, the next instruction in the lineup proceeds into the fetch stage, and then creates a streamlined process similar to an assembly line.



## References

Bryant, Randal, and David Richard. O'Hallaron. *Computer Systems: A Programmer's Perspective*. Upper Saddle River, NJ: Prentice Hall, 2003. Print.

Shen, John Paul., and Mikko H. Lipasti. *Modern Processor Design: Fundamentals of Superscalar Processors*. Boston: McGraw-Hill Higher Education, 2005. Print.

"CSE378: Machine Organization & Assembly Language." *CSE378: Machine Organization & Assembly Language*. Web. 30 May 2016.