

# Lecture 9: Pipelining intro

Monday, January 28, 2019 9:06 AM

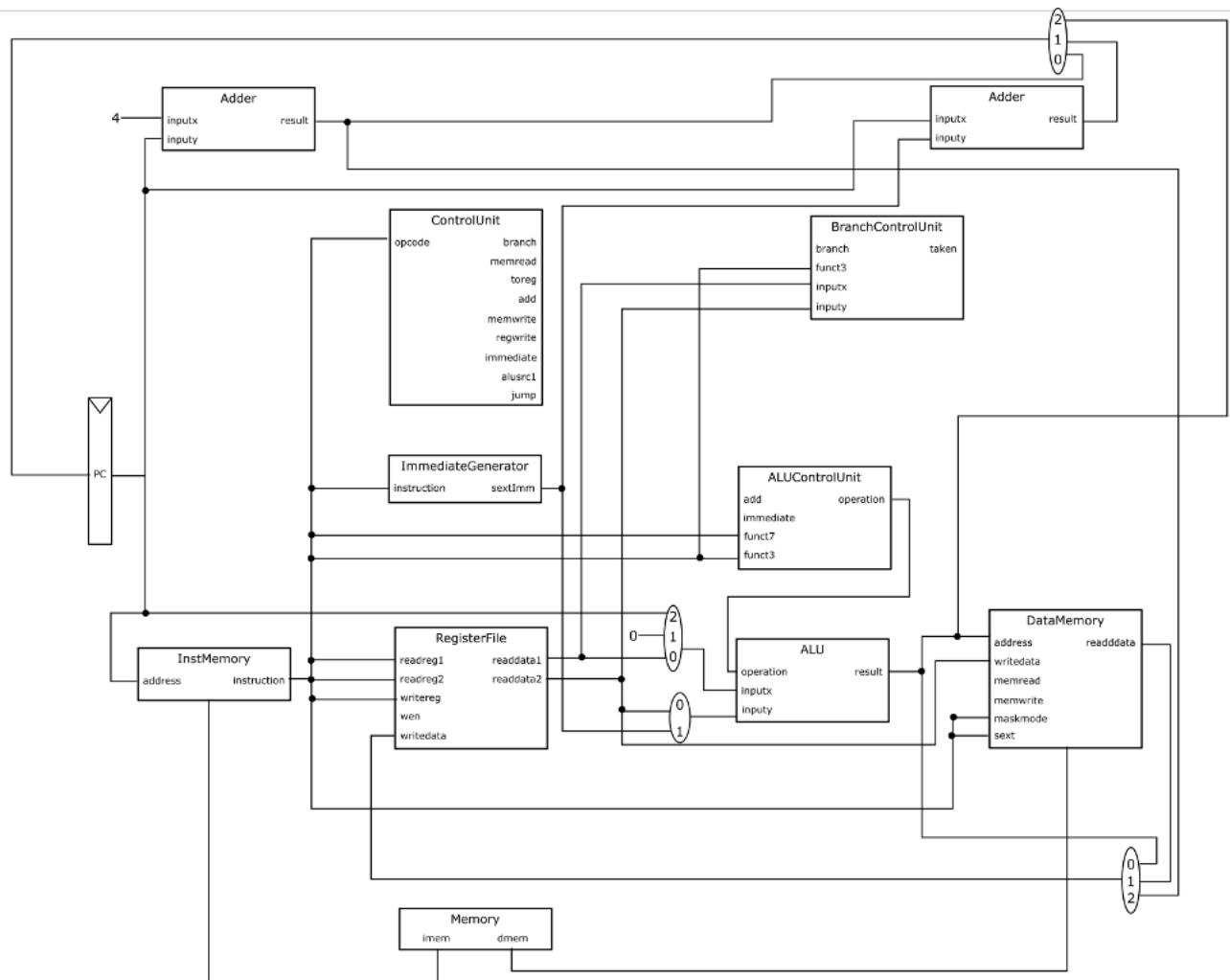
## Outline

- Multicycle CPU
  - Performance
- Pipelined CPU
  - Performance

### INSTALLING THE XKCD DEVELOPMENT ENVIRONMENT

1. SPIN UP A VM
2. SPIN UP A VM INSIDE THAT VM
3. CONTINUE SPINNING UP NESTED VMs AND CONTAINERS UNTIL YOU GET FIRED

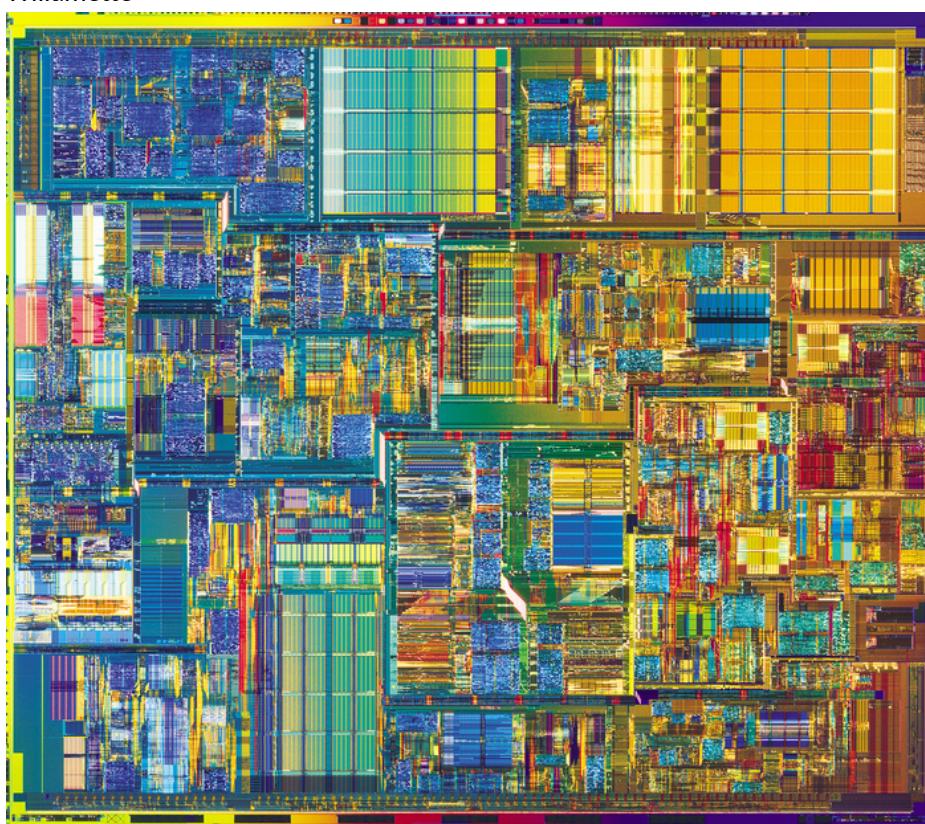
## Multi cycle CPU



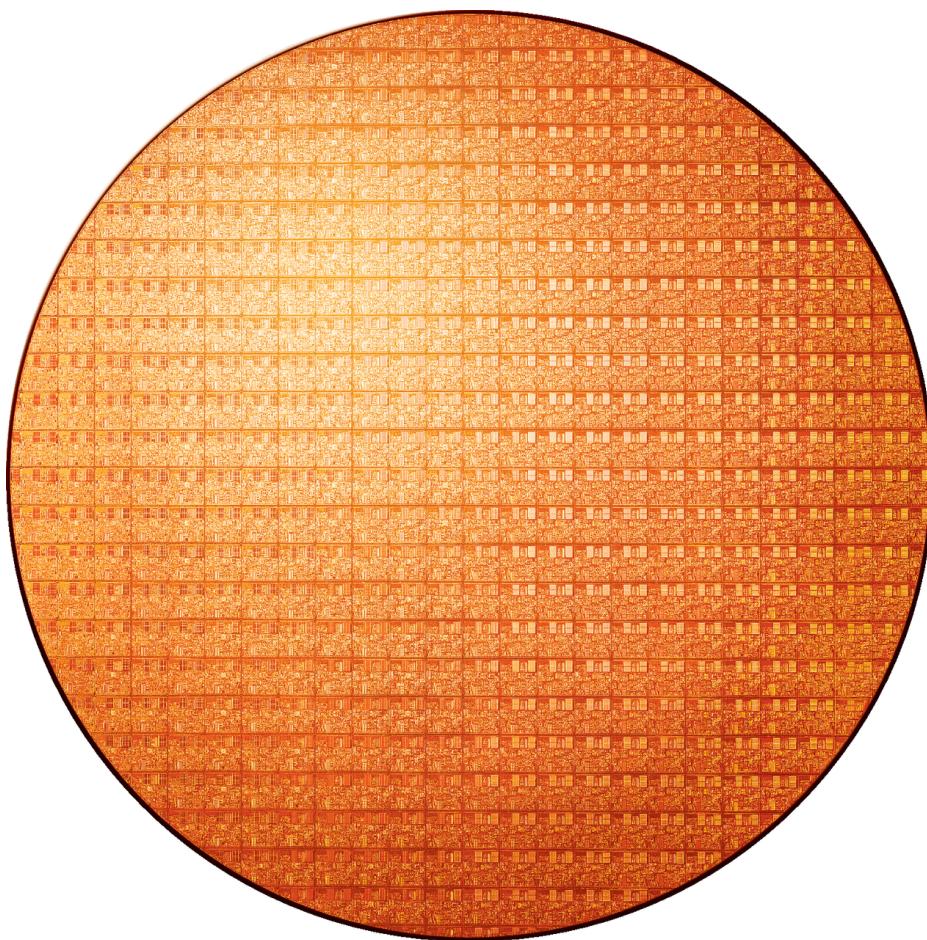
Pipelined CPU performance

## Pentium 4 (NetBurst)

Willamette



Wafer:



## Power for pipelined processors