# Computer architecture

Homework week 1

## Instructions

Submit by e-mail to the lecturer, as a PDF document with your name and student ID near the beginning. You can work in groups of 2. Deadline: Sept 9th, 23:59.

## Question 1

Research and describe the x86 initialization sequence: what happens when the Pentium processor is powered up initially, until the operating system code starts to run. Phrase it in your own words: no copy-paste. Detail your information sources and explain why you trust them; do not source Wikipedia directly. Max 1 page A4.

## Question 2

Research, define and separate the following concepts: throughput, bandwidth, latency, access time, performance and efficiency. Again, phrase in your own words. Explain the units in which these values are expressed, with examples. Max 2 pages A4.

## Question 3

Research and collect the following properties for the Intel Pentium, Sun UltraSPARC, MIPS R3000, IBM PowerPC, IBM POWER7, DEC AXP 21264, DEC StrongARM, Intel Itanium 2, NVidia G80, Intel Core i7:

- Year when first sold as product
- Company selling the 1st product
- Number of transistors on chip (eg. 25million)
- Silicon die area (mm2, eg. 110mm2)
- Processor clock frequency (eg. 1GHz)
- L1 and L2 cache size on chip (if applicable, eg. 32KB L1, 512KB L2)
- Technology size (microns/nanometers, eg. 65nm)
- Name of the instruction set architecture (eg. “x86”)

- Micro-architecture code name (if applicable/found, eg. “Nehalem”)
- Link to documentation/article explaining the micro-architecture
- List of all information sources you used to find the information above.

Put the information into a table. You can use any information source you like.