

x86 Assembly Tutorial

From 8086 to Intel Core Processors

U. Plonus
u.plonus@gmail.com

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1 Introduction

1.1 Overview

1.2 Environment

2 8086

3 Temp

- 8087
- 286/287 (Intel) / Am286 (AMD)
- Intel386/387 (Intel) / Am386 (AMD)
- Intel486 (Intel) / AM486/Am5x86/AMD-K5 (AMD)
- Intel Pentium (Intel) / AMD-K6 (AMD)
- CLFSH
- CX8 (CMPXCHG8B (AMD))
- CMPXCHG16B
- CMOV
- MSR
- TSC
 - Invariant TSC
- RDTSCP
- SEP
- SYSCALL/SYSRET in 64-bit Mode
- MMX
- 3DNow (AMD)
- MMX ext (AMD)
- 3DNow ext (AMD)
- PREFETCHW (3DNow AMD)
- SSE
- SSE2
- SSE3

3 Temp

- SSSE3
- SSE4A (AMD)
- SSE4.2
- Intel 64 Architecture/Long Mode (AMD)
- MISCSELECT (SGX) (Intel)
- SGX1 (Intel)
- SGX2 (Intel)
- ENCLV (SGX) (Intel)
- ENCLS (SGX) (Intel)
- SVM (AMD)
- AVX
- AVX2
- XOP (AMD)
- AESNI (AES (AMD))
- FMA
- FMA4 (AMD)
- F16C
- RDRAND
- LZCNT (ABM (AMD))
- BMI1
- BMI2
- POPCNT
- TBM (AMD)
- MOVBE
- MONITOR
- MONITORX (AMD)
- PCMLQDQ

- FXSR
- SKINIT (AMD)
- LAHF/SAHF in 64-bit Mode
- FSGSBASE
- SHA
- CLFLUSHOPT (CLFLOPT (AMD))
- SMAP
- ADX
- RDSEED
- SME (AMD)
- SEV (AMD)
- PageFlushMgr (AMD)
- ES (AMD)
- CLZERO (AMD)
- Instruction Retired Counter (AMD)
- Error Pointer (AMD)
- XSAVEOPT
- XSAVEC
- XGETBV
- XSAVES
- XSAVE
- OSXSAVE
- HTT
- PSE-36
- PAT
- MCA
- PGE

3 Temp

- MTRR
- APIC
- MCE
- PAE
- PSE
- DE
- VME
- SMEP
- DTSE64 (Intel)
- MONITOR (Intel)
- DS-CPL (Intel)
- VMX (Intel)
- SMX (Intel)
- EIST (Intel)
- TM2 (Intel)
- CNXT-ID (Intel)
- SDBG (Intel)
- xTPR Update Control (Intel)
- PDCM (Intel)
- PCID (Intel)
- DCA (Intel)
- x2APIC (Intel)
- TSC-Deadline (Intel)
- PSN (Intel)
- DS (Intel)
- ACPI (Intel)
- SS (Intel)

- TM (Intel)
- PBE (Intel)
- Execute Disable Flag (Intel)
- IA32_TSC_ADJUST (Intel)
- HLE (Intel)
- INVPCID (Intel)
- RTM (Intel)
- RDT-M (Intel)
- MPX (Intel)
- RDT-A (Intel)
- AVX512F (Intel)
- AVX512DQ (Intel)
- AVX512_IFMA (Intel)
- CLWB (Intel)
- Intel Processor Trace (Intel)
- AVX512PF (Intel)
- AVX512ER (Intel)
- AVX512CD (Intel)
- AVX512BW (Intel)
- AVX512VL (Intel)

A Code Chunks

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