Linux Assembler Cheat Sheet

by Gregor Lüdi (Siniansung) via cheatography.com/20378/cs/3174/

General Registers

EAX	Accumulator
EBX	Base
ECX	Counter
EDX	Data

General Registers: specific values are expected when calling the kernel.

Pointer-Registers

ESP	Stackpointer
EBP	Basepointer
EIP	Instructionpointer

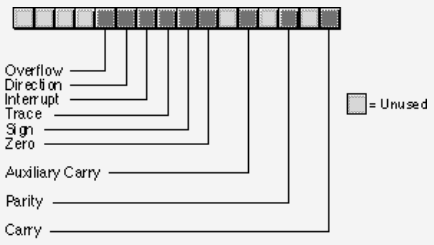
Index-Registers

ESI	Source Index
EDI	Destination Index

Segment- Registers

ECS	Code-Segment
EDS	Data-Segment
ESS	Stack-Segment
EES	Extra-Segment

Flags



NASM Basics

-f	filesystem
-g	debugginfos
-o	output

Compiling a Code

```
nasm -f elf32 -g -o filename.o filename.nasm
ld -o filename filename.o
```

in 64bit Architecture use -f elf64

Syscall-Numbers Linux

EAX	Name(EBX, ECX, EDX)
1	exit(int)
2	fork(pointer)
3	read(uint, char*, int)
4	write(uint, char*, int)
5	open(char *, int, int)

Linux Syscall Reference

NASM Code-Sections

.text	Code
.data	initialized Data
.bss	uninitialized Data

Example

```
global _start
.data
        msg db " Hello World",0xa
        len equ $-msg
.text
_start:
        mov eax, 0x4
        mov ebx, 0x1
        mov ecx, msg
        mov edx, len
        int 0x80
exit:
        mov eax, 0x1
        mov ebx, 0x1
        int 0x80
```

Misc

`int` *Nr*	call Interrup *Nr*
`call` *label*	jumps to *label*
`ret`	returns to call
`nop`	no operation
`lea` *dest*,*src*	load effective addr. to *dest*

`int 0x80` calls the Kernel in Linux

Logical Operations

`neg` *op*	two-Complement
`not` *op*	invert each bit
`and` *dest*,*source*	*dest*= *dest* ^ *source*
`or` *dest*,*source*	*dest*=*dest* v *source*
`xor` *dest*, *surce*	*dest* = *dest* XOR *source*

Control / Jumps (signed Int)

`cmp` *op1*,*op2*	Compare *op1* with *op2*
`test` *op1*,*op2*	bitwise comparison
`jmp` *dest*	unconditional Jump
`je` *dest*	Jump if equal
`jne` *dest*	Jump if not equal
`jz` *dest*	Jump if zero
`jnz` *dest*	Jump if not zero
`jg` *dest*	Jump if greater
`jge` *dest*	Jump if greater or equal
`jl` *dest*	Jump if less
`jle` *dest*	Jump if less or equal

For unsigned Integer use `ja, jae` (above) or `jb, jbe` (below)

Mnemonics Intel

`mov` *dest*, *source*	Moves Data
`add` *dest*, *value*	Add *value* to *dest*
`sub` *dest*,*value*	Subtract *value3* *from* dest*
`inc` *dest*	Increment *dest*

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Mnemonics Intel (cont)	
`dec dest`	Decrement *dest*
`mul src`	Multiply EAX and *src*
`imul dest, source`	*dest* = *dest* * *source*

General Structure:
`[label] mnemonic [operands] [;comment]`

Stack Operations	
push *source*	Insert Value onto the stack
pop *dest*	Remove value from stack

Stack is a LIFO-Storage (Last In First Out)

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