

Basic ARM64 Assembly Guide

Register	Syntax	Purpose
Link register	lr or x30	holds return address
Stack pointer	sp	holds base address of current stack frame
Register 0	x0 w0	General purpose, input arguments, return values all 64 bits last 32 bits (first 32 bits set to 0)
Register 1 (also 2, ..., 7)	x1 w1	General purpose, input arguments all 64 bits last 32 bits (first 32 bits set to 0)
Register 8 (also 9, ..., 15)	x8 w8	General purpose all 64 bits last 32 bits (first 32 bits set to 0)

Instruction	What it does
str x, [Mem]	Store x 's value into memory at address Mem
str x, [Mem, a]	Store x 's value into memory at address Mem + a
ldr x, [Mem]	Load data stored at Mem into register x
ldr x, [Mem, a]	Load data stored at Mem + a into register x
mov x, y	Copy y 's value into x
sub x, y, z	$x = y - z$
add x, y, z	$x = y + z$
cmp x, y	compare x to y , set conditions
b LABEL	go to LABEL (unconditionally)
bl LABEL	call procedure at LABEL
blt LABEL	go to LABEL if condition says $x < y$
ble LABEL	go to LABEL if condition says $x \leq y$
bgt LABEL	go to LABEL if condition says $x > y$
bge LABEL	go to LABEL if condition says $x \geq y$
beq LABEL	go to LABEL if condition says $x = y$
bne LABEL	go to LABEL if condition says $x \neq y$
ret	branch unconditionally to the address in x30 = lr