Princeton University
COS 217: Introduction to Programming Systems
x86-64 Registers

General Purpose (can use directly in instructions)

Bits 63-0	Bits 31-0	Bits 15-0	Bits 15-8	Bits 7-0	Description
rax	eax	ax	ah	al	Scratch, return value (caller-saved)
rbx	ebx	bx	bh	bl	Local variable (callee-saved)
rcx	ecx	cx	ch	cl	Argument 4 (caller-saved)
rdx	edx	dx	dh	dl	Argument 3 (caller-saved)
rsi	esi	si		sil	Argument 2 (caller-saved)
rdi	edi	di		dil	Argument 1 (caller-saved)
rbp	ebp	bp		bpl	Local variable (callee-saved)
rsp	esp	sp		spl	Stack pointer
r8	r8d	r8w		r8b	Argument 5 (caller-saved)
r9	r9d	r9w		r9b	Argument 6 (caller-saved)
r10	r10d	r10w		r10b	Scratch (caller-saved)
r11	r11d	r11w		r11b	Scratch (caller-saved)
r12	r12d	r12w		r12b	Local variable (callee-saved)
r13	r13d	r13w		r13b	Local variable (callee-saved)
r14	r14d	r14w		r14b	Local variable (callee-saved)
r15	r15d	r15w		r15b	Local variable (callee-saved)

Special Purpose (cannot use directly in instructions)

Bits 63-0	Bits 31-0	Bits 15-0	Bits 15-8	Bits 7-0	Description
	eflags				Status and control (condition code bits)
rip					Instruction pointer

General Purpose (can use directly in instructions)

Bits 63-0	Bits 31-0	Bits 15-0	Bits 15-8	Bits 7-0	Description
rdi	edi	di		dil	Argument 1 (caller-saved)
rsi	esi	si		sil	Argument 2 (caller-saved)
rdx	edx	dx	dh	dl	Argument 3 (caller-saved)
rcx	ecx	cx	ch	cl	Argument 4 (caller-saved)
r8	r8d	r8w		r8b	Argument 5 (caller-saved)
r9	r9d	r9w		r9b	Argument 6 (caller-saved)
rax	eax	ax	ah	al	Scratch, return value (caller-saved)
r10	r10d	r10w		r10b	Scratch (caller-saved)
r11	r11d	r11w		r11b	Scratch (caller-saved)
rbx	ebx	bx	bh	bl	Local variable (callee-saved)
rbp	ebp	bp		bpl	Local variable (callee-saved)
r12	r12d	r12w		r12b	Local variable (callee-saved)
r13	r13d	r13w		r13b	Local variable (callee-saved)
r14	r14d	r14w		r14b	Local variable (callee-saved)
r15	r15d	r15w		r15b	Local variable (callee-saved)
rsp	esp	sp		spl	Stack pointer

Special Purpose (cannot use directly in instructions)

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	eflags				Status and control (condition code bits)
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