Princeton University
COS 217: Introduction to Programming Systems
Examples of IA-32 Instruction Operands

Type of Operand	Syntax	Semantics
Immediate	`$5` `$i`	`5` `i (that is, the address denoted by i)`
Register	`%eax`	`reg[EAX]`
Memory: Direct/Absolute Addressing	`i`	`mem[i]`
Memory: Indirect Addressing	`(%eax)`	`mem[reg[EAX]]`
Memory: Base + Displacement Addressing	`5(%eax)` `i(%eax)`	`mem[5 + reg[EAX]]` `mem[i + reg[EAX]]`

Memory: Indexed Addressing	`(%eax,%ecx)`
	`5(%eax,%ecx)`
	`i(%eax,%ecx)`
		`mem[reg[EAX] + reg[ECX]]`
		`mem[5 + reg[EAX] + reg[ECX])`
		`mem[i + reg[EAX] + reg[ECX])`

Memory: Scaled Indexed Addressing	`(,%ecx,4)`
	`5(,%ecx,4)`
	`i(,%ecx,4)`
	`(%eax,%ecx,4)`
	`5(%eax,%ecx,4)`
	`i(%eax,%ecx,4)`
		`mem[reg[ECX] * 4]`
		`mem[5 + (reg[ECX] * 4)]`
		`mem[i + (reg[ECX] * 4)]`
		`mem[reg[EAX] + (reg[ECX] * 4)]`
		`mem[5 + reg[EAX] + (reg[ECX] * 4)]`
		`mem[i + reg[EAX] + (reg[ECX] * 4)]`