

## Bryant Chapter 4

### 4.13

Stage	Generic <code>irmovq V, rB</code>	Specific <code>irmovq \$128, %rsp</code>
Fetch	$\text{icode:ifun} \leftarrow M_1[\text{PC}]$ $\text{rA:rB} \leftarrow M_1[\text{PC}+1]$ $\text{valC} \leftarrow M_8[\text{PC}+2]$ $\text{valP} \leftarrow \text{PC} + 10$	$\text{icode:ifun} \leftarrow M_1[0x016] = 0x3:0x0$ $\text{rA:rB} \leftarrow M_1[0x017] = 0xF:0x4$ $\text{valC} \leftarrow M_8[0x018] = 0x80$ $\text{valP} \leftarrow 0x016 + 0xA = 0x020$
Decode		
Execute	$\text{valE} \leftarrow 0 + \text{valC}$	$\text{valE} \leftarrow 0x0 + 0x80 = 0x80$
Memory		
Write back	$\text{R}[\text{rB}] \leftarrow \text{valE}$	$\text{R}[\%rsp] \leftarrow 0x80$
PC update	$\text{PC} \leftarrow \text{valP}$	$\text{PC} \leftarrow \text{valP} = 0x020$

### 4.14

Stage	Generic <code>popq rA</code>	Specific <code>popq %rax</code>
Fetch	$\text{icode:ifun} \leftarrow M_1[\text{PC}]$ $\text{rA:rB} \leftarrow M_1[\text{PC}+1]$ $\text{valP} \leftarrow \text{PC} + 2$	$\text{icode:ifun} \leftarrow M_1[0x02C] = 0xB:0x0$ $\text{rA:rB} \leftarrow M_1[0x02D] = 0x0:0xF$ $\text{valP} \leftarrow 0x02C + 0x2 = 0x02E$
Decode	$\text{valA} \leftarrow \text{R}[\%rsp]$ $\text{valB} \leftarrow \text{R}[\%rsp]$	
Execute	$\text{valE} \leftarrow \text{valB} + 8$	
Memory	$\text{valM} \leftarrow M_8[\text{valA}]$	
Write back	$\text{R}[\%rsp] \leftarrow \text{valE}$ $\text{R}[\text{rA}] \leftarrow \text{valM}$	
PC update	$\text{PC} \leftarrow \text{valP}$	

**4.43**

**Bryant Chapter 6**

**6.12**

**6.17**

**6.18**