

HW1. Y86-64 Encoding and Decoding

due: 2019.09.30.

Please write the answers for the following questions. Students should provide detailed explanations for the answers.

byte:	0	1	2	3	4	5	6	7	8	9
halt	[0]	[0]								
nop	[1]	[0]								
rrmovq/cmovCC rA, rB	[2]	cc	rA	rB						
irmovq V, rB	[3]	0	F	rB	V					
rmmovq rA, D(rB)	[4]	0	rA	rB	D					
mrmovq D(rB), rA	[5]	0	rA	rB	D					
OPq rA, rB	[6]	fn	rA	rB						
jCC Dest	[7]	cc			Dest					
call Dest	[8]	0			Dest					
ret	[9]	0								
pushq rA	A	0	rA	F						
popq rA	B	0	rA	F						

1. Y86-64 encoding (20 points)

Convert the following Y86-64 assembly codes into binaries. Refer to the Y86-64 specification from the above figure and our textbook.

```
irmovq $1, %rax  
addq %rdi, %rax  
ret
```

2. Y86-64 encoding (20 points)

Convert the following Y86-64 assembly codes into binaries. Refer to the Y86-64 specification from the above figure and our textbook.

```
comeOn:          /* suppose at address 0x123 */  
    addq %rax, %rax  
    jge comeOn
```

3. Y86-64 decoding (60 points)

Convert the following object codes (binaries) into the corresponding Y86-64 assembly codes. Refer to the Y86-64 specification from the above figure and our textbook.