Homework 8

Y86-64 Instructions

Please write down the byte codes of the following Y86-64 instructions.

Y86-64 instructions	Byte codes (hex value)
rrmovq %rbx, %rdx	0x2032
jmp 0xabc	0x70bc0a000000000000
addq %rbx, %rax	0x6030
call 0x1234	0x8034120000000000000
rmmovl %rcx, 0x12(%rbx)	0x40131200000000000000
jle 0x280	0x718002000000000000
pushq %rax	0xa00f

Y86-64 Programs

```
0x000:                          |       .pos 0
0x000: 30f4 00100000 00000000   | Init: irmovq 0x1000, %rsp
0x00a: 30f5 00100000 00000000   |       irmovq 0x1000, %rbp
0x014: _[1]_                    |       call Main
0x01d: 00                       |       halt
                                |
                                |
_[2]_:                          |       .align 8
_[3]_: 33010000 00000000        | Array:  .quad 0x133
0x028: fc0d0000 00000000        |       .quad 0xdfc
0x030: 2f0f0000 00000000        |       .quad 0xf2f
0x038: 33020000 00000000        |       .quad 0x_[4]_
                                |
                                |
_[5]_: a05f                     | Main:  pushq %rbp
0x042: 2045                     |       rrmovq %rsp, %rbp
0x044: a03f                     |       ____[6]____
0x046: ____[7]____              |       irmovq Array, %rdx
0x050: 5002 00000000 00000000   |       mrmovq (%rdx), %rax
0x05a: 5032 08000000 00000000   |       mrmovq 8(%rdx), %rbx
0x064: 5012 10000000 00000000   |       mrmovq 0x10(%rdx), %rcx
0x06e: 5022 18000000 00000000   |       mrmovq 0x18(%rdx), %rdx
```

```
_[8]_: ____[9]____              |        addq %rax, %rbx
0x07a: 6112                     |        subq %rcx, %rdx
0x07c: 6131                     |        ____[10]____
0x07e: b03f                     |        popq %rbx
0x080: 70 55000000 00000000     |        jmp End
0x08a: 2054                     | End:   rrmovq %rbp, %rsp
0x08c: b05f                     |        popq %rbp
0x08e: 90                       |        ret
```

1. Please fill in the blanks within above Y86-64 binary and assembly code.
   [1] 80 40000000 00000000
   [2] 0x020
   [3] 0x020
   [4] 233
   [5] 0x040
   [6] pushq %rbx
   [7] 30f220000000 00000000
   [8] 0x078
   [9] 6003
   [10] subq %rbx, %rcx

2. Please calculate the value of below registers after the program HALT.

%rdx	0xffffffff fffff304
%rsp	0x1000
CC.ZF	1
CC.SF	0
CC.OF	0