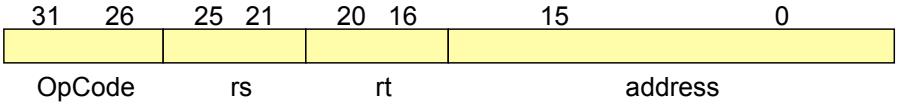
Question 1: (10 points)

For the MIPS code given in Question **??**, notice the `bne` and `j` instructions at the addresses `0x0040 0010` and `0x0040 0020` respectively. What are the hexadecimal representations of these instructions? To solve this problem, you need to recall that registers `$t3` and `$zero` are mapped to register number 11 and 0, respectively. Also, you need to recall the formats and effects of branch and jump instructions. They are shown below.

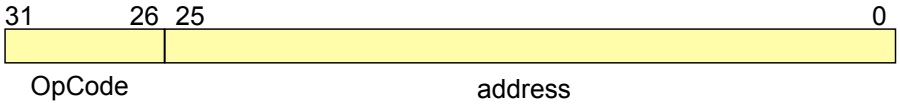
a. (5 points) Branch Instruction




```
bne rs, rt, address <==> PC <-- PC + 4
                         if(rs != rt)
                         PC <-- PC + sign_extended(address << 2)
```

The opcode of `bne` instruction is `000101`.

b. (5 points) Jump Instruction




```
j address <==> PC <-- PC + 4
               PC <-- concat (PC[31-28], IR[25-0]) << 2
```

The opcode of `j` instruction is `000010`.