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CECS 285, Spring 2015
Section 1 (4344)
HW #5, Due: 2015, March 18

Activities 1 & 2.

```
          MOV       DPTR, #MYDATA        ;address of string
          MOV       R0, #30H             ;destination address


    LOOP:
          CLR       A                    ;A <- 0
          MOVC      A, @A+DPTR           ;A <- Next Character
          JZ        ACT2                 ;Go to Activity two if character is null
          MOV       @R0, A               ;copy to destination
          INC       DPTR                 ;address of next character
          INC       R0                   ;address of next destination
          SJMP      LOOP                 ;try to get next character


    ACT2:
          MOV       R0, #40H             ;R0 <- 0x40
          MOV       R1, #60H             ;R1 <- 0x60

    LOOP2:
          MOV       A, @R0               ;A <- RAM[R0]
          MOV       @R1, A               ;RAM[R1] <- RAM[R0]
          INC       R0                   ;R0 <- R0 + 1
          INC       R1                   ;R1 <- R1 + 1
          CJNE      R0, #60H, LOOP2      ;Keep copying RAM[R0] into RAM[R1]
                                         ;unitl R0 == 0x60


          ORG       200H                 ;address of string

    MYDATA:
          DB        "Joseph Okonoboh", 0

    END
```

Activity 3.

```
          MOV       DPTR, #MYDATA        ;address of y values

          MOV       A, R0                ;A <- x
          MOVC      A, @A+DPTR           ;A <- x^2 + 2x + 9
          MOV       R2, A                ;R2 <- x^2 + 2x + 9


          ORG       200H
    MYDATA:
          DB        9, 12, 17, 24, 33, 44, 57, 72, 89, 108
    END
```

1. Explain the difference between the following two instructions:

   ```
   MOVC  A, @A+DPTR
   MOV   A, @R0
   ```

   Answer. Both instructions are register indirect addressing; however, the first instruction is capable of accessing data stored in external RAM or ROM since the `DPTR` register is 16-bits, while the latter instruction is limited to accessing internal RAM. Additionally, in the first instruction, the value in the `A` register is used as an offset to the address in the `DPTR` register.

2. The invalid instructions are:

   ```
   MOV   A, @R2
   MOVC  A, @R0+DPTR
   ```

3. Explain the difference between the following two instructions:

   ```
   MOV   A, 40H
   MOV   A, #40H
   ```

   Answer. The first instruction reads the byte at RAM location 0x40 into register `A`, while the latter instruction stores the decimal number 64 in `A`.

4. Explain the difference between the following two instructions:

   ```
   MOV   40H, A
   MOV   40H, #0A
   ```

   Answer. The first instruction copies the value in register `A` into the RAM location at 0x40, while the latter instruction copies the decimal value 10 into the same RAM location.

5. Give the RAM address for the following registers.

A	=	0xE0
B	=	0xF0
R0	=	0x00
R2	=	0x02
PSW	=	0xD0
SP	=	0x81
DPL	=	0x82
DPH	=	0x83