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Q 14) WAP to generate a SQUARE-WAVE of 1 KHz using SOD pin of 8085.

Soln:

```
BACK: MVI   A, 40H      ; SIM Command = 0100  0000
      SIM
      CALL  DLAY
      MVI   A, C0H      ; SIM Command = 1100  0000
      SIM
      CALL  DLAY
      JMP   BACK
```

For a square wave of 1 KHz, the time period is 1 msec.
Hence the required delay is of 0.5 msec.
Assume 8085 is working at 3 MHZ

```
DLAY: MVI   B, XXH      ; 7 T-states … … … Count is calculated later
BACK: DCR   B           ; 4 T-states … … … Decrement Count
      JNZ   BACK        ; 10T (true) / 7T (false)
      RET               ; 10T-states
```

T_D = MT + [(Count)$_d$ x NT] – 3T
Here MT = Time outside the loop = 17T
NT = Time inside the loop = 14T
T_D = 17T + [(Count)$_d$ x 14T] – 3T
Required T_D = 0.5 msec = 0.5 x 10^{-3} sec
1T = 0.333 µsec = 0.333 x 10^{-6} sec
Substituting the above values we get:
$0.5x10^{-3} = 17x(0.333x10^{-6}) + [(Count)_d \times 14x(0.333x10^{-6})] - 3x(0.333x10^{-6})$
Count = 6AH

Q 15) WAP to transfer the value 35H serially with one start bit "0" and one stop bit "1".

Soln: Serial communication happens bit by bit starting from the LSB.
As per the question, we need to send the start bit (0), then the data and finally the stop bit (1).
Hence a total of 10 bits will move out as follows:

```
  0              1 0 1 0 1 1 0 0           1
Start      8-data bits in reverse order    Stop
```

```
      MVI   A, 40H      ; start bit (0)
      SIM
      MVI   A, C0H      ; send a "1"
      SIM
      MVI   A, 40H      ; send a "0"
      SIM
      MVI   A, C0H      ; send a "1"
      SIM
      MVI   A, 40H      ; send a "0"
      SIM
      MVI   A, C0H
      SIM               ; send a "1"
      SIM               ; send a "1" again
      MVI   A, 40H      ; send a "0"
      SIM
      SIM               ; send a "0" again
      MVI   A, C0H      ; send a "1" as the stop bit
      SIM
      RST1
```