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PROGRAM 3

AIM

To perform multiplication of two 8-bit numbers using the bit addition method.

ALGORITHM

1. Start the program by initializing the accumulator and D register with 0.
2. Move the first number to be multiplied to B register.
3. Move the second number to be multiplied to C register.
4. Add the data in B register to that in the accumulator.
5. If there is a carry, increment value in D register, and decrement value in C register.
6. If carry is zero, decrement value in C register.
7. If the value in C is non-zero, repeat from step 4, else go to next step.
8. Store the value in accumulator at a suitable memory address.
9. Move the value in D register to accumulator.

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10. Store the value in accumulator at a memory address different from that used in step 8.

11. Terminate the program.

PROGRAM

```
MVI A, 00        Initialize A to 00
MVI D, 00        Initialize D to 00
MVI B, 35        Initialize B with first number
MVI C, 21        Initialize C with second number
LOOP: ADD B      Add value in B to A and store in accumulator.
JNC NEXT         Jump on no carry to 'NEXT' label
INR D            Increment value in D register
NEXT: DCR C      Decrement value in C register
JNZ LOOP         Jump on no zero to 'LOOP' label.
STA 4152         Store the value of accumulator
MOV A, D         Move value in D to accumulator
STA 4153         Store the value of accumulator
HLT              Halt the program.
```

SAMPLE I/O

	Address	Data
Input :	B register	35
	C register	21
Output :	4152	223
	4153	2

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PROGRAM 4

AIM

To perform multiplication of two 8-bit numbers using the bit rotation method.

ALGORITHM

1. Start the program by moving the two numbers to multiply in the accumulator and E register.
2. Initialize the D register with 0, B register with 8, H and L registers with 0.
3. Add the value in HL register pair with itself, and store the result in HL register pair.
4. Rotate the content of accumulator left with considering carry.
5. If there is a carry, add the contents of DE register pair with those of HL register pair and store the result in HL register pair.
6. Decrement the value in register B.
7. If value in B is non-zero, repeat from step 3.
8. Store the value in HL register pair at a suitable memory address.

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such that the next address is unused.

9. Terminate the program.

PROGRAM

```
MVI E, 35          Initialize E with first number to multiply
MVI A, 21          Initialize accumulator with second number
MVI D, 00          Initialize D with 00
MVI B, 08          Initialize B with 08 for 8 bit rotation
LXI H, 0000H       Initialize HL register pair with 0000.
LOOP: DAD H        Add HL register pair's value with itself; store in HL
RAL                Rotate left the accumulator content with carry.
JNC NEXT           Jump on no carry to 'NEXT' label.
DAD D              Add DE register pair with HL; store result in HL.
NEXT: DCR B        Decrement value in B register.
JNZ LOOP           Jump on no zero to 'LOOP' label.
SHLD 4152          Store HL register data using direct addressing.
HLT                Halt the program.
```

SAMPLE I/O

	Address	Data
Input :	E register	35
	Accumulator	21
Output :	4152	223
	4153	2

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