Основные принципы функционирования вычислительных устройств.

1. Задание:

Найти количество положительных чисел в 16 ячейках, начиная с ячейки, следующей после указанной в @0x7F. Записать результат в ячейку 0xFF.

Task: Find the number of positive numbers in 16 cells, starting from the cell following the one specified in @0x7F. Write the result to cell 0xFF.

2. Текст программы и скриншот с комментариями:

```
        R0 <- 16
        R1 <- @0x7F
        R1 <- R1++
LOOP:   @8 <- R1
        R2 <- @0x00
        R3 <- 1
        R3 <- R3 * R2
        RC <- @LABEL(S)
        RC <- @LABEL(Z)
        R3 <- @0xFF
        R3 <- R3++
        @0xFF <- R3
LABEL:  R1 <- R1++
        R2 <- 1
        R0 <- R0 - R2
        RC <- @STOP (Z)
        RC <- @LOOP
```

```
STOP:    RC <- @STOP
```

```
1         R0 <- 16          ; сколько чисел
2         R1 <- @0x7F
3         R1 <- R1++        ; следующий адрес после записанного в @0x7F
4   LOOP: @8 <- R1
5         R2 <- @0x00
6         R3 <- 1
7         R3 <- R3 * R2     ; проверка числа на положительность
8         RC <- @LABEL(S)
9         RC <- @LABEL(Z)
10        R3 <- @0xFF
11        R3 <- R3++        ; счетчик
12        @0xFF <- R3
13  LABEL: R1 <- R1++       ; смещение адреса ячейки
14        R2 <- 1
15        R0 <- R0 - R2
16        RC <- @STOP (Z)
17        RC <- @LOOP
18  STOP: RC <- @STOP
```

3. Состояние памяти и регистров:

А) Начальное состояние: (положительные числа подчеркнуты)

R0:	0 0 0 0 0 0 0 0
R1:	0 0 0 0 0 0 0 0
R2:	0 0 0 0 0 0 0 0
R3:	0 0 0 0 0 0 0 0
RC:	0 0 0 0 0 0 0 0
RF:	0 0 0 0 0 0 0 0

```
   00 01 02 03 04 05 06 07 08 09 0a 0b 0c 0d 0e 0f
00 30 10 14 7f e5 21 08 18 00 3c 01 6e a0 15 b0 15
01 1c ff ef 23 ff e5 38 01 52 b0 1d c0 05 c0 1d 00
02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
04 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
05 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
06 03 00 ec 00 05 00 00 01 00 00 ff 00 00 04 08 09
07 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 5f
08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
09 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0a 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0b 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0c 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0d 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0e 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0f 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

Б) Финальное состояние:

R0:	0	0	0	0	0	0	0	0
R1:	0	1	1	1	0	0	0	0
R2:	0	0	0	0	0	0	0	1
R3:	0	0	0	0	0	1	1	0
RC:	0	0	0	1	1	1	0	1
RF:	0	0	0	0	0	0	0	1

```
   00 01 02 03 04 05 06 07 08 09 0a 0b 0c 0d 0e 0f
00 30 10 14 7f e5 21 08 18 6f 3c 01 6e a0 15 b0 15
01 1c ff ef 23 ff e5 38 01 52 b0 1d c0 05 c0 1d 00
02 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
03 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
04 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
05 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
06 03 00 ec 00 05 00 00 01 00 00 ff 00 00 04 08 09
07 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 5f
08 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
09 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0a 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0b 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0c 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0d 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0e 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0f 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 06
```