

```

.ORIG x3000
    LD R6, PTR          ; Pointer to first data memory location
    AND R1, R1, #0      ; Counter = 0

READ_LOOP
    LEA R0, PROMPT      ; Load prompt
    PUTS
    GETC                ; Get char
    OUT                 ; Echo
    ADD R0, R0, #-15     ; subtract 15
    ADD R0, R0, #-15     ; subtract another 15 (total 30)
    ADD R0, R0, #-3      ; subtract 3 (now 33)
    ADD R0, R0, #-15
    STR R0, R6, #0       ; Store at memory
    ADD R6, R6, #1       ; Increment pointer
    ADD R1, R1, #1       ; Increment counter
    LD R2, EIGHT
    NOT R2, R2
    ADD R2, R2, #1
    ADD R2, R1, R2
    BRz LOOP            ; If 8 inputs, start sorting
    BR READ_LOOP

LOOP ;start of the main loop
    AND R0, R0, #0
    AND R1, R1, #0
    AND R2, R2, #0
    ST R2, Switch
    LD R0, N1
    LD R1, N2
    NOT R1, R1
    ADD R1, R1, #1
    ADD R0, R0, R1
    BRp OnT0
    BRnz Next1
Next1;check N2 and N3
    AND R0, R0, #0
    AND R1, R1, #0
    LD R0, N2

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    LD R1, N3
    NOT R1, R1
    ADD R1, R1, #1
    ADD R0, R0, R1
    BRp ToTwo
    BRnz Next2
Next2; Check N3 and N4
    AND R0, R0, #0
    AND R1, R1, #0
    LD R0, N3
    LD R1, N4
    NOT R1, R1
    ADD R1, R1, #1
    ADD R0, R0, R1
    BRp Threefor
    BRnz Next3
Next3;Checks N4 and N5
    AND R0, R0, #0
    AND R1, R1, #0
    LD R0, N4
    LD R1, N5
    NOT R1, R1
    ADD R1, R1, #1
    ADD R0, R0, R1
    BRp ForFive
    BRnz Next4
Next4; Checks N5 and N6
    AND R0, R0, #0
    AND R1,R1, #0
    LD R0, N5
    LD R1, N6
    NOT R1, R1
    ADD R1, R1, #1
    ADD R0, R0, R1
    BRp FivSix
    BRnz Next5
Next5; Checks N6 and N7
    AND R0, R0, #0
    AND R1, R1, #0
    LD R0, N6

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    LD R1, N7
    NOT R1, R1
    ADD R1, R1, #1
    ADD R0, R0, R1
    BRp SixSev
    BRnz Next6
Next6 ;Checks N7 and N8
    AND R0, R0, #0
    AND R1, R1, #0
    LD R0, N7
    LD R1, N8
    NOT R1, R1
    ADD R1, R1, #1
    ADD R0, R0, R1
    BRp SevEig
    LD R2, Switch
    BRz PRINT
    BR LOOP
OnT0 ;Changes R0 and R1
    AND R0,R0,#0
    AND R1,R1,#0
    LD R0,N1
    LD R1,N2
    ST R0,N2
    ST R1,N1
    LD R2, Switch
    ADD R2, R2, #1
    ST R2, Switch
    BR LOOP
ToTwo ;Switches N2 and N3
    AND R0,R0,#0
    AND R1,R1,#0
    LD R0, N2
    LD R1, N3
    ST R0, N3
    ST R1, N2
    LD R2, Switch
    ADD R2, R2, #1
    ST R2, Switch
    BR LOOP

```

Threefor ;Switches N3 and N4

```
    AND R0, R0, #0
    AND R1, R1, #0
    LD R0, N3
    LD R1, N4
    ST R0, N4
    ST R1, N3
    LD R2, Switch
    ADD R2, R2, #1
    ST R2, Switch
    BR LOOP
```

ForFive

```
    AND R0, R0, #0
    AND R1, R1, #0
    LD R0, N4
    LD R1, N5
    ST R0, N5
    ST R1, N4
    LD R2, Switch
    ADD R2, R2, #1
    ST R2, Switch
    BR LOOP
```

FivSix

```
    AND R0, R0, #0
    AND R1, R1, #0
    LD R0, N5
    LD R1, N6
    ST R0, N6
    ST R1, N5
    LD R2, Switch
    ADD R2, R2, #1
    ST R2, Switch
    BR LOOP
```

SixSev

```
    AND R0, R0, #0
    AND R1, R1, #0
    LD R0, N6
    LD R1, N7
    ST R0, N7
    ST R1, N6
```

```

    LD R2, Switch
    ADD R2, R2, #1
    ST R2, Switch
    BR LOOP
SevEig
    AND R0, R0, #0
    AND R1, R1, #0
    LD R0, N7
    LD R1, N8
    ST R0, N8
    ST R1, N7
    LD R2, Switch
    ADD R2, R2, #1
    ST R2, Switch
    BR LOOP

PRINT
    LD R0, NEWLINE    ; Load newline character
    OUT
    LEA R6, N1
    LD R3, EIGHT
PRINT_LOOP
    LDR R0, R6, #0
    ADD R0, R0, #15
    ADD R0, R0, #15
    ADD R0, R0, #15
    ADD R0, R0, #3    ; Convert to ASCII
    OUT
    LD R0, SPACE
    OUT
    ADD R6, R6, #1
    ADD R3, R3, #-1
    BRp PRINT_LOOP

    HALT

PROMPT  .STRINGZ "\nEnter a digit (0-9): "
SPACE   .FILL x0020
EIGHT   .FILL #8
Switch  .FILL 0

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```
PTR      .FILL N1
N1       .FILL 0
N2       .FILL 0
N3       .FILL 0
N4       .FILL 0
N5       .FILL 0
N6       .FILL 0
N7       .FILL 0
N8       .FILL 0
NEWLINE  .FILL x000A      ; ASCII newline (line feed)

        .END

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