1. Assume a sequence of nonnegative integers is stored in consecutive memory locations, one integer per memory location, starting at location $x4000$. Each integer has a value between 0 and 30,000 (decimal). The sequence terminates with the value $-1(\text{FFFF})$. What does the following program do?

```
.ORIG  x3000
AND   R4,R4,#0
AND   R3,R3,#0
LD    R0,NUMBERS
LOOP  LDR  R1,R0,#0
     NOT  R2,R1
     BRz  DONE
     AND  R2,R1,#1
     BRz  L1
     ADD  R4,R4,#1
     BRnzp NEXT
L1    ADD  R3,R3,#1
NEXT   ADD  R0,R0,#1
     BRNZP LOOP
DONE   TRAP  x25
NUMBERS  .FILL x4000
.END
```
2. Write a Bubble sort program as a SUBROUTINE. Then write the main program that inputs one-digit positive integers (the number of these integers is not more than 16) until a zero is entered. It then calls the Bubble sort subroutine, which sorts those numbers. When it returns, have the main program output the sorted numbers on the console.

Use LC-2 simulator to run your program, and write down the content in your registers (R0 – R7) on your lab report along with your program.