```
/* Button Handler Subroutine */


/*
   Outputs: R0 - Bit Number of switch being pressed if any (-1 if none or more than one).
*/

buttonHandler
        STMFD SP!,{R1-R4,LR}            //Preserve registers on the stack

        LDR R0, =KEYS                  //R0 = Interface Address
        LDRB R1, [R0]                  //R1 = Interface Bytes (Switches connected to bit 0,1,2,3)

        LDR R2, =0                     //count
        LDR R3, =0                     //switchOnCount
        LDR R4, =0                     //switchOnID

floop
        CMP R2, #3
        BGE exitLoop
        LDR R0, = 0x01                 //Switch Mask
        AND R0, R0, R1                 //Extract Bit 0 (Switch X)

        CMP R0, #1                     //If switch.isOff()
        BEQ switchOn
        ADD R3, R3, #1                 //switchOnCount++
        MOV R4, R2                     //switchOnID = count

        ADD R2, R2, #1                 //count++
        LSR R1, R1, #1                 //Interface Bytes >>

switchOn
        ADD R2, R2, #1                 //count++
        LSR R1, R1, #1                 //Interface Bytes >>

exitLoop
        CMP R3, #1                     // if switchOnCount != 1
        BNE negativeReturn
        MOV R0, R4                     //R0 = switchOnID
        B end

negativeReturn
        LDR R0, =0xFFFFFFFF            //R0 = -1
end
        LDMFD SP!,{R1-R4,LR}
```