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;Assignment #8

;Description: reverse a string of 9 characters

.ORIG x3000

LD R6, BASE ;R6 = -BASE

NOT R6, R6 ;R6 = BASE

ADD R6, R6, #1 ;make 2's complement

LD R1, MAX ;R1 = -MAX

LD R3, nlneg ;R3 = -10

LEA R4, labl ;R4 = point at labl

JSR READS ;call READS subroutine

LEA R0, msg3 ;load msg3

PUTS ;display msg 3

LD R0, MAXpos ;load stack

PUTS ;display stack

LD R0, nl ;load new line

OUT ;display new line

LEA R0, msg4 ;load msg4 and display

PUTS

GETC ;get character

OUT ;display char

AND R3, R3, #0 ;clear R3

ADD R3, R3, R0 ;R3 = R0

NOT R3, R3 ;R3 = -R3

ADD R3, R3, #1 ; make 2's complement

LD R0, nl ;load new line

OUT ;display new line

LEA R0, msg5 ;load msg5 and display it

PUTS

loop2 JSR POP ;call POP subroutine

ADD R1, R3, R0 ;Check if char poped same as char entered

BRz loop2 ;if true dont display loop again

OUT ;if false display

BR loop2 ;loop again

done HALT

PUSH ADD R2, R6, R1 ;check if stack at max

BRz fail ;if it is branch to fail

ADD R6, R6, #-1 ;decrement pointer by one

STR R0, R6, #0 ;push character to stack

fail RET

POP LD R1, BASE ;load R1 with base

ADD R2, R6, R1 ;check if stack empty

BRz done ;if stack empty branch to done

LDR R0, R6, #0 ;load content of pointer R6

ADD R6, R6, #1 ;increment pointer

RET

READS ADD R5, R7, #0 ;save R7 in R5

LEA R0, msg1 ;R0 = address of first msg

PUTS ;display msg1

loop1 GETC ;get char entered

OUT ;diplay char

JSR PUSH ;push subroutine

STR R0, R4, #0 ;str char in block of memory

ADD R4, R4, #1 ;add block address pointer

ADD R0, R0, R3 ;check if char entered is return

BRp loop1 ;if not return loop

LEA R0, msg2 ;load msg2

PUTS ;display msg2

LEA R0, labl ;load address of string entered

PUTS ;display string entered

ADD R7, R5, #0 ;put R7 back to go back to main

RET

BASE .FILL xC000

MAX .FILL xC009

MAXpos .FILL x3FF7

msg1 .STRINGZ "Enter a string no more than 9 chars ==> "

msg2 .STRINGZ "The string entered is: "

msg3 .STRINGZ "The reversed string is: "

msg4 .STRINGZ "Enter a character => "

msg5 .STRINGZ "The modified string is: "

nlneg .FILL #-10 ;negative value of return key

nl .FILL #10

labl .BLKW #9

.END