# Program for Laboratory 11: Exception Handling
# This program generates exception number 7 by referring to an address
# which is out of range
# Implements:
# sum = 0;
# i = 9;
# do {
# sum = sum + A[9-i]
# B[9-i] = sum;
# i--;
# until (i == 0)

.globl main
main:
  add     $t2, $0, $0     # sum = 0  (sum is in $t2)
  add     $t1, $0, $0     # Set $t1 to point to beginning of data
  lw      $t4, 84($t1)    # Constant 4 stored in $t4
  lw      $t0, 88($t1)    # Constant 9 stored in $t0 (i)
  lw      $t5, 92($t1)    # Constant -1 stored in $t5
  add     $t1, $t1,$t4    # A starts at 4 (move $t1 to point to A)
loop:
  lw      $t3, 0($t1)     # $t3 has A[i]
  add     $t2, $t2, $t3   # sum = sum + A[i]
  sw      $t2, 40($t1)    # B[i] = sum
  add     $t1, $t1, $t4   # update address pointer
  add     $t0, $t0, $t5   # i--
  beq     $t0, $0, done  # if i > 0 go to loop
  j       loop
done:
  add     $t1, $0,$0      # Set $t1 to point to beginning of data
  sw      $t2, 0($t1)     # sum is stored
  li      $v0, 4          # print_str
  la      $a0, message
  syscall
  li      $v0, 1          # print_int
  lw      $a0, sum
  syscall
  jr      $ra              # return to the main program

.data
sum:    .word   0
A:      .word   0, 1, 2, 3, 4, 5, 6, 7, 8, 9
B:      .word   A, B, C, D, E, F, 10, 11, 12, 13
Four:   .word   4
Nine:   .word   9
Minus1: .word   -1
message:    .asciiz "\nThe value of sum is:  "