

CS 2734, Dynamic array in MIPS, page 1 of 1

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# CS 2734, Computer Organization II, Spr 2001
# MIPS program showing arrays and functions
#include <stdio.h>
#include <stdlib.h>
void Write_array(int *, int);
void main(void)
{
    int *A = (int *) malloc(40 );
    int *p = A;
    int i;
    int j = 10;
    for (j = 10; j <= 100; j += 10)
        *(p++) = j;
    *(A + 3) = 47;
    i = *(A + 5);
    printf("Value in i: %i\n", i);
    Write_array(A, 10);
}

void Write_array(int *A, int n)
{
    int j;
    printf("Values in array A: ");
    for (j = 0; j < n; j++)
        printf("%i ", *(A + j));
    printf("\n");
}

# ten42% write_array2
# Value in i: 60
# Values in array A: 10 20 30 47 50 60 70 80 90 100
#####
.globl main
main: addu $s7, $zero, $ra
      add $sp, $sp, -40 # make room on stack for A
      move $t0, $sp # address of A is $sp
      move $t3, $t0 # pointer into array A
      addi $t4, $0, 10 # initial value for A
L:    sw $t4, 0($t3) # store value into memory
      addi $t3, $t3, 4 # move pointer
      addi $t4, $t4, 10 # update value
      slti $t5, $t4, 100 # check for final value
      bne $t5, $0, L # branch back to loop
      addi $t2, $zero, 47
      sw $t2, 12($t0)
      lw $t1, 20($t0)
      ## Print value in $t1
      li $v0, 4
      la $a0, Regt1
      syscall
      li $v0, 1
      move $a0, $t1
      syscall
      jal Newl
      ## Print the array
      li $v0, 4
      la $a0, Amess
      syscall
      move $a0, $sp # $sp is address of A
      li $a1, 10
      jal Write_array
      jal Newl
##### Finish main#####
      add $sp, $sp, 40 # delete room on stack
      addu $ra, $zero, $s7
      jr $ra
##### End of main function #####
```

```
# CS 2734, Computer Organization II, Fall 2001
# MIPS program showing arrays and functions
#include <stdio.h>
void Write_array(int [], int);
void main(void)
{
    int A[10] = {10, 20, 30, 40, 50, 60,
                70, 80, 90, 100};
    int i;
    #
    #
    # A[3] = 47;
    # i = A[5];
    # printf("Value in i: %i\n", i);
    # Write_array(A, 10);
    # }
    void Write_array(int A[10], int n)
    {
        int j;
        printf("Values in array A: ");
        for (j = 0; j < n; j++)
            printf("%i ", A[j]);
        printf("\n");
    }
    # ten42% write_array
    # Value in i: 60
    # Values in array A: 10 20 30 47 50 60 70 80 90 100
    #####
    .globl main
    main: addu $s7, $zero, $ra
    .data
    A: .word 10, 20, 30, 40, 50, 60, 70, 80, 90, 100
    .text
    la $t0, A

    addi $t2, $zero, 47
    sw $t2, 12($t0)
    lw $t1, 20($t0)
    ## Print value in $t1
    li $v0, 4
    la $a0, Regt1
    syscall
    li $v0, 1
    move $a0, $t1
    syscall
    jal Newl
    ## Print the array
    li $v0, 4
    la $a0, Amess
    syscall
    la $a0, A
    li $a1, 10
    jal Write_array
    jal Newl
    ##### Finish main#####

    addu $ra, $zero, $s7
    jr $ra
    ##### End of main function #####
```