# Pràctica 3

## Activitat 3.A.

### Exercici 3.1.

| .data  # int mat1[5][6];  # TOTAL: 5\*6\*4 = 120 B  # log2(4) = 2  .align 2  mat1: .space 120  # char mat2[3][5];  # TOTAL: 3\*5\*1 = 15 B  mat2: .space 15  # long long mat3[2][2]  # TOTAL: 2\*2\*8 = 32 B  # log2(8) = 3  .align 3  mat3: .space 32  # int mat4[2][3] = {{2, 3, 1}, {2, 4, 3}};  # log2(4) = 2  .align 2  mat4:   2,3,1,          2,4,3 |
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### Exercici 3.2

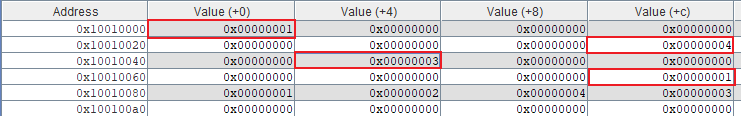
// @mat + (i\*NC + j)\*T

| @mat1[4][3] = | mat + (4\*6 + 3)\*4 |
| --- | --- |
| @mat2[2][4] = | mat + (2\*5 + 4)\*1 |
| @mat3[1][0] = | mat + (1\*2 + 0 )\*8 |
| @mat4[0][2] = | mat + (0\*3 + 2)\*4 |

### Exercici 3.3 + Exercici 3.4

| .data  # int mat1[5][6];  .align 2  mat1:   .space 120  # int mat4[2][3] = {{2, 3, 1}, {2, 4, 3}};  .align 2  mat4:   2,3,1,2,4,3  # int col = 2;  col:    .word 2      .text      .globl main  main:      # 0 | ra | 4 B      # TOTAL: 4 B      addiu $sp,$sp,-4      sw $ra,0($sp)      la $a0,mat4  # a0 = &mat4[0][0]      lw $a1,8($a0)  # a1 = mat4[0][2]      la $t0,col      lw $a2,0($t0)  # a2 = col      jal subr      li $t1,108  # (4\*6 + 3)\*4      la $t0,mat1      addu $t0,$t0,$t1  # &mat[4][3]      sw $v0,0($t0)  # mat[4][3] = subr(mat4, mat4[0][2], col);      la $a0,mat4  # a0 = &mat4[0][0]      li $a1,1      li $a2,1      jal subr      la $t0,mat1      sw $v0,0($t0)  # mat[0][0] = subr(mat4, 1, 1);      lw $ra,0($sp)      addiu $sp,$sp,4      jr $ra  subr:      li $t3,3 # NC      mult $a1, $t3  # i\*3      mflo $t0  # copy Lo to $t0      addu $t0,$t0,$a2  # i\*3+j      sll $t0,$t0,2  # (i\*3+j)\*4      addu $t0,$t0,$a0  # &x + (i\*3+j)\*4      lw $t2,0($t0)      la $t3,mat1      li $t6,6 # NC      mult $a2,$t6  # j\*6      mflo $t1  # copy Lo to $t1      addiu $t1,$t1,5  # j\*6+5      sll $t1,$t1,2  # (j\*6+5)\*4      addu $t1,$t3,$t1  # &mat1 + (j\*6+5)\*4      sw $t2,0($t1)  #  mat1[j][5] = x[i][j];      move $v0,$a1  # return i      jr $ra |
| --- |

| **Direccions calculades** |
| --- |
| &mat1[0][0] = 0x10010000  &mat1[1][5] = ((1\*6+5)\*4)=44 = 0x2C => 0x1001002C  &mat1[2][5] = ((2\*6+5)\*4)=68 = 0x44 => 0x10010044  &mat1[4][3] = ((4\*6+3)\*4)=108 = 0x6C => 0x1001006C |



| $a0 = | 0x10010078 |
| --- | --- |
| $a1 = | 0x00000001 |
| $a2 = | 0x00000002 |
| $ra = | 0x00400070 |

## Activitat 3.C

### Exercici 3.5

| @mat[i][2] = | mat + (i\*6 + 2)\*4 |
| --- | --- |
| STRIDE | @mat[i+1][2] 🡪 mat + ((i+1)\*6 + 2)\*4 🡪 mat + 24i + 32  @mat[i+0][2] 🡪 mat + ((i+0)\*6 + 2)\*4 🡪 mat + 24i + 8  24 B |

### Exercici 3.6

// MAX\_SIZE = NF\*NC\*T = 4\*6\*4 = 96 = 0x60.

| .data  mat:    .word 0,0,2,0,0,0      .word 0,0,4,0,0,0      .word 0,0,6,0,0,0      .word 0,0,8,0,0,0    resultat: .byte 0      .text      .globl main  main:      addiu $sp,$sp,-4      sw $ra,0($sp)      la $a0,mat      jal suma\_col      la $t0,resultat      sw $v0,0($t0)  # resultat = suma\_col(mat);        lw $ra,0($sp)      addiu $sp,$sp,4      jr $ra  suma\_col:      la $t1,mat      addiu $t0,$t1,8  # p = &mat[0][2]      move $t1,$zero  # i = 0      move $v0,$zero  # suma = 0      li $t4,4  # max  suma\_col\_for:      lw $t2,0($t0)  # \*p      addu $v0,$v0,$t2  # suma += \*p      addiu $t0,$t0,24  # p+=6      addiu $t1,$t1,1  # i++      blt $t1,$t4,suma\_col\_for  # if i<max goto suma\_col\_for      jr $ra |
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