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Práctica 2: Lenguaje Ensamblador

Código en lenguaje C

```c
#include<stdio.h>
#include<stdlib.h>

void crearVector(int *);
void mostrarArreglo(int *);
void burbuja(int *);
void mostrarBurbuja(int *);

int main(){
    int vector[20];

    crearVector(vector);
    mostrarArreglo(vector);
    burbuja(vector);
    mostrarBurbuja(vector);
    return 0;
}


void crearVector(int *vec){
    srand(time(NULL));
    int i;
    for(i=0; i<20;i++){
        vec[i] = 0 + rand()%(100-0+1);

    }

}

void mostrarArreglo(int *vec){
    int i;
    printf("Se muestra arreglo sin acomodar\n");
    for(i =0; i<20;i++){
        printf("%d, ", vec[i]);
    }
    printf("\n");
}

void burbuja(int *vec){
    int j,k,aux;
    for(j=0; j<20; j++){
        for(k=0; k<20; k++){
            if(vec[k]>vec[k+1]){
                aux = vec[k+1];
                vec[k+1] = vec[k];
                vec[k] = aux;
            }
        }
    }
}

void mostrarBurbuja(int *vec){
    int l;
    printf("\nSe muestra arreglo ordenado mediante ordenamiento de burbuja:\n");
    for(l=0;l<20;l++){
        printf("%d, ",vec[l]);
    }
    printf("\n");
}
```

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Código en lenguaje ensamblador

```
    .file   "Burbuja.c"
    .def    ___main;    .scl    2;  .type   32; .endef
    .text
.globl _main
    .def    _main;  .scl    2;  .type   32; .endef
_main:
    pushl   %ebp
    movl    %esp, %ebp
    subl    $120, %esp
    andl    $-16, %esp
    movl    $0, %eax
    addl    $15, %eax
    addl    $15, %eax
    shrl    $4, %eax
    sall    $4, %eax
    movl    %eax, -92(%ebp)
    movl    -92(%ebp), %eax
    call    __alloca
    call    ___main
    leal    -88(%ebp), %eax
    movl    %eax, (%esp)
    call    _crearVector
    leal    -88(%ebp), %eax
    movl    %eax, (%esp)
    call    _mostrarArreglo
    leal    -88(%ebp), %eax
    movl    %eax, (%esp)
    call    _burbuja
    leal    -88(%ebp), %eax
    movl    %eax, (%esp)
    call    _mostrarBurbuja
    movl    $0, %eax
    leave
    ret
.globl _crearVector
    .def    _crearVector;   .scl    2;  .type   32; .endef
_crearVector:
    pushl   %ebp
    movl    %esp, %ebp
    pushl   %edi
    pushl   %esi
    pushl   %ebx
    subl    $12, %esp
    movl    $0, (%esp)
    call    _time
    movl    %eax, (%esp)
    call    _srand
    movl    $0, -16(%ebp)
```

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```
    L3:
    cmpl    $19, -16(%ebp)
    jg  L2
    movl    -16(%ebp), %eax
    leal    0(,%eax,4), %ebx
    movl    8(%ebp), %esi
    call    _rand
    movl    %eax, %edi
    movl    $680390859, %eax
    imull   %edi
    sarl    $4, %edx
    movl    %edi, %eax
    sarl    $31, %eax
    subl    %eax, %edx
    movl    %edx, %eax
    movl    %eax, (%ebx,%esi)
    movl    (%ebx,%esi), %ecx
    movl    %ecx, %eax
    sall    $2, %eax
    addl    %ecx, %eax
    leal    0(,%eax,4), %edx
    addl    %edx, %eax
    sall    $2, %eax
    addl    %ecx, %eax
    subl    %eax, %edi
    movl    %edi, %eax
    movl    %eax, (%ebx,%esi)
    leal    -16(%ebp), %eax
    incl    (%eax)
    jmp L3
L2:
    addl    $12, %esp
    popl    %ebx
    popl    %esi
    popl    %edi
    popl    %ebp
    ret
    .section .rdata,"dr"
    .align 4
LC0:
    .ascii "Se muestra arreglo sin acomodar\12\0"
LC1:
    .ascii "%d, \0"
LC2:
    .ascii "\12\0"
    .text
.globl _mostrarArreglo
    .def    _mostrarArreglo;    .scl    2;  .type   32; .endef
_mostrarArreglo:
    pushl   %ebp
    movl    %esp, %ebp
    subl    $24, %esp
    movl    $LC0, (%esp)
    call    _printf
    movl    $0, -4(%ebp)
L7:
    cmpl    $19, -4(%ebp)
    jg  L8
    movl    -4(%ebp), %eax
    leal    0(,%eax,4), %edx
    movl    8(%ebp), %eax
    movl    (%edx,%eax), %eax
    movl    %eax, 4(%esp)
    movl    $LC1, (%esp)
    call    _printf
    leal    -4(%ebp), %eax
    incl    (%eax)
    jmp L7
L8:
    movl    $LC2, (%esp)
    call    _printf
    leave
    ret
.globl _burbuja
    .def    _burbuja;   .scl    2;  .type   32; .endef
_burbuja:
    pushl   %ebp
    movl    %esp, %ebp
    pushl   %ebx
    subl    $12, %esp
    movl    $0, -8(%ebp)
```

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```
L11:
    cmpl    $19, -8(%ebp)
    jg  L10
    movl    $0, -12(%ebp)
L14:
    cmpl    $19, -12(%ebp)
    jg  L13
    movl    -12(%ebp), %eax
    leal    0(,%eax,4), %ecx
    movl    8(%ebp), %ebx
    movl    -12(%ebp), %eax
    sall    $2, %eax
    addl    8(%ebp), %eax
    leal    4(%eax), %edx
    movl    (%ecx,%ebx), %eax
    cmpl    (%edx), %eax
    jle L16
    movl    -12(%ebp), %eax
    sall    $2, %eax
    addl    8(%ebp), %eax
    addl    $4, %eax
    movl    (%eax), %eax
    movl    %eax, -16(%ebp)
    movl    -12(%ebp), %eax
    sall    $2, %eax
    addl    8(%ebp), %eax
    leal    4(%eax), %ecx
    movl    -12(%ebp), %eax
    leal    0(,%eax,4), %edx
    movl    8(%ebp), %eax
    movl    (%edx,%eax), %eax
    movl    %eax, (%ecx)
    movl    -12(%ebp), %eax
    leal    0(,%eax,4), %ecx
    movl    8(%ebp), %edx
    movl    -16(%ebp), %eax
    movl    %eax, (%ecx,%edx)
L16:
    leal    -12(%ebp), %eax
    incl    (%eax)
    jmp L14
L13:
    leal    -8(%ebp), %eax
    incl    (%eax)
    jmp L11
L10:
    addl    $12, %esp
    popl    %ebx
    popl    %ebp
    ret
    .section .rdata,"dr"
    .align 4
LC3:
    .ascii "\12Se muestra arreglo ordenado mediante ordenamiento de burbuja:\12\0"
    .text
.globl _mostrarBurbuja
    .def    _mostrarBurbuja;    .scl    2;  .type   32; .endef
_mostrarBurbuja:
    pushl   %ebp
    movl    %esp, %ebp
    subl    $24, %esp
    movl    $LC3, (%esp)
    call    _printf
    movl    $0, -4(%ebp)
L19:
    cmpl    $19, -4(%ebp)
    jg  L20
    movl    -4(%ebp), %eax
    leal    0(,%eax,4), %edx
    movl    8(%ebp), %eax
    movl    (%edx,%eax), %eax
    movl    %eax, 4(%esp)
    movl    $LC1, (%esp)
    call    _printf
    leal    -4(%ebp), %eax
    incl    (%eax)
    jmp L19
L20:
    movl    $LC2, (%esp)
    call    _printf
    leave
    ret
    .def    _printf;    .scl    3;  .type   32; .endef
    .def    _rand;  .scl    3;  .type   32; .endef
    .def    _time;  .scl    3;  .type   32; .endef
    .def    _srand; .scl    3;  .type   32; .endef
    .def    _mostrarBurbuja;    .scl    3;  .type   32; .endef
    .def    _burbuja;   .scl    3;  .type   32; .endef
    .def    _mostrarArreglo;    .scl    3;  .type   32; .endef
    .def    _crearVector;   .scl    3;  .type   32; .endef
```