

CS 354

Machine Organization and Programming

Lecture 20

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Function Call Practice
Arrays
Structures
Security

```
1 int increment(int x){
2     return x+1;
3 }
4
5 int main(){
6     int f = 10;
7     f = increment(f);
8     return 0;
9 }
```

```
1     .file      "increment1.c"
2     .text
3     .globl    increment
4     .type     increment, @function
5 increment:
6     endbr32
7     pushl     %ebp
8     movl      %esp, %ebp
9     movl      8(%ebp), %eax
10    addl      $1, %eax
11    popl      %ebp
12    ret
13    .size     increment, .-increment
14    .globl    main
15    .type     main, @function
16 main:
17    endbr32
18    pushl     %ebp
19    movl      %esp, %ebp
20    subl      $16, %esp
21    movl      $10, -4(%ebp)
22    pushl     -4(%ebp)
23    call      increment
24    addl      $4, %esp
25    movl      %eax, -4(%ebp)
26    movl      $0, %eax
27    leave
28    ret
29    .size     main, .-main
30    .ident     "GCC: (Ubuntu 9.3.0-10ubuntu2) 9.3.0"
31    .section   .note.GNU-stack,"",@progbits
```

```
1 void increment(int *x){
2     *x = *x + 1;
3 }
4
5 int main(){
6     int f = 10;
7     increment(&f);
8     return 0;
9 }
```

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1     .file      "increment2.c"
2     .text
3     .globl    increment
4     .type     increment, @function
5 increment:
6     endbr32
7     pushl     %ebp
8     movl      %esp, %ebp
9     movl      8(%ebp), %eax
10    movl      (%eax), %eax
11    leal      1(%eax), %edx
12    movl      8(%ebp), %eax
13    movl      %edx, (%eax)
14    nop
15    popl      %ebp
16    ret
17    .size     increment, .-increment
18    .globl    main
19    .type     main, @function
20 main:
21    endbr32
22    pushl     %ebp
23    movl      %esp, %ebp
24    subl      $16, %esp
25    movl      $10, -4(%ebp)
26    leal      -4(%ebp), %eax
27    pushl     %eax
28    call      increment
29    addl      $4, %esp
30    movl      $0, %eax
31    leave
```

```
26      .
27  main:
```