Princeton University
COS 217: Introduction to Programming Systems
IA-32 C Function Calling Conventions

When function f calls function g:

1. f pushes parameters:
   - pushl paramM
   - ... pushl param2
   - pushl param1

2. f executes call instruction:
   - call g

3. g pushes f’s EBP:
   - pushl %ebp

4. g moves ESP to EBP:
   - movl %esp, %ebp

5. If necessary, g pushes EBX, ESI, or EDI and local variables:
   - pushl %ebx
   - pushl localvar1
   - pushl localvar2
   - pushl localvarN

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(6) g uses parameters and local variables to compute a return value, and moves that value to EAX:

```assembly
movl 8(%ebp), ???
movl 12(%ebp), ???
movl -8(%ebp), ???
movl -12(%ebp), ???
movl ???, %eax
```

(7) If necessary, g restores EDI, ESI, or EBX:

```assembly
movl -4(%ebp), %ebx
```

(8) g moves EBP to ESP:

```assembly
movl %ebp, %esp
```

(9) g pops from stack into EBP:

```assembly
popl %ebp
```

(10) g executes ret instruction:

```assembly
ret
```

(11) f pops actual parameters from stack, and uses return value in EAX:

```assembly
addl $4*M, %esp
movl %eax, ???
```