ICS 233 Sample Quiz03 Key – Term 182

1. [15 points] Write a procedure named **Divide**that computes the division of two signed 32-bit operands. The operands will be passed on the stack, by-value, using the C-calling convention. The procedure returns the result in the EAX register. Assume there is no division overflow.

**Divide proc**

**push ebp**

**mov ebp, esp**

**mov eax, [ebp + 8]**

**CDQ**

**idiv [ebp + 12]**

**mov esp, ebp**

**ret**

**Divide endp**

1. [15 points] Consider the following procedure call:

**product = mul2(b, 12);**

where product and b are integer variables.

Translate the call into an x86-64 assembly language program fragment, if (a) the call uses: (a) C-calling convention, (b) stdcall calling convention (c) Microsoft 64-bit calling convention.

Note: Don’t use INVOKE in your answers.

1. **push 12**

**push b**

**call mul2**

**add esp, 8**

**mov product, eax**

1. **push 12**

**push b**

**call mul2@8**

**mov product, eax**

1. **mov ecx, b**

**mov edx, 12**

**call mul2**

**mov product, eax**

1. [5 points] In a 32-bit procedure, the instruction

enter 32, 0

is equivalent to what assembly language instructions?

**push ebp**

**mov ebp, esp**

**sub esp, 32**

4. [15 points] Write a macro MAX2 that puts the maximum of its two signed arguments on the EAX register. Assume that the two arguments are constants.

**MAX2 macro arg1, arg2**

**LOCAL L1**

**mov eax, arg1**

**cmp eax, arg2**

**JGE L1**

**mov eax, arg2**

**L1:**

**endm**

5. [5 points] Consider the AL register:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | a7 | a6 | a5 | a4 | a3 | a2 | a1 | a0 |

What is the content of AL and the Carry Flag CF after executing the following statements?

STC

MOV CL, 2

RCL AL, CL

CF AL

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **a6** |  | **a5** | **a4** | **a3** | **a2** | **a1** | **a0** | **1** | **a7** |

6. [5 points] What is the content of the DL register after executing the following instructions:

MOV DL, 00111011B

XOR DL, 11101100B

**11010111B**