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Homework Quiz (HW #2)

February 6, 2001
CS152 Computer Architecture and Engineering

This quiz covers one of the problems from homework #2.
Good Luck!

Your Name:	
SID Number:	
Discussion Section:	

Total:	

General ASCII Number Conversions

In homework problem 3.25, you were asked to write a MIPS assembly language program to convert an integer input value into the ASCII string which is its base-10 representation. For this quiz, construct a similar program that will convert an integer into a string of *any* base (from 2 to 16). The specifications are as follows:

- The first argument (a0) contains the *unsigned* input value
- The Second argument (a1) contains the base and will be such that: $2 \leq a1 \leq 16$ (you can assume that this is true)
- The Third argument (a2) will be a pointer to a buffer in memory for the result. Resulting strings should be *null terminated* (i.e. the end of the string is 0).
- On exit, v0 will contain the length of the resulting string
- This procedure (call it "intoa") must adhere to all MIPS conventions

Examples:

If the input value (a0) is 14, the base (a1) is 2, then the output string (pointed at by a2) should be "1110" (followed by the null character) and the result register (v0) should contain 4.

If the input value (a0) is 182, the base (a1) is 16, then the output string (pointed at by a2) should be "B6" (followed by the null character) and the result register (v0) should contain 2.

If the input value (a0) is 153, the base (a1) is 10, then the output string (pointed at by a2) should be "153" (followed by the null character) and the result register (v0) should contain 3.

The important portion of the ASCII character table is as follows (Note that values are in HEX notation):

Character	ASCII Value
"0"	0x30
"1"	0x31
"2"	0x32
"3"	0x33
"4"	0x34
"5"	0x35
"6"	0x36
"7"	0x37
"8"	0x38
"9"	0x39

Character	ASCII Value
"A"	0x41
"B"	0x42
"C"	0x43
"D"	0x44
"E"	0x45
"F"	0x46

We have included the MIPS instruction set as an attachment. Write this routine in as few instructions as possible on the following page. Assume the virtual MIPS machine (no branch delay slots).

[This page is for your answer]