

Problem 1: Find the SPECint2000 results for the API UP2000 750 MHz processor, it can be found at the <http://www.spec.org> web site. This processor has a SPECint2000 rating of 456. Find another processor with a slower rating but for which individual benchmarks are faster. (Look for different CPU families.) How many of the benchmarks are faster on the slower processor?

Problem 2: Write a DLX assembly language program to convert a string of characters to lower case. The string is NULL-terminated (the character following the end of the string is a zero). Register `r1` contains the address of the start of the string. Any register can be modified. The code for an upper-case A is 65 and the code for a lower-case a is 97. Modify the string, do not create a new one.

Problem 3: Write a DLX assembly language program that loads an element of a two-dimensional array to a register.

Register `r1` holds address of the start of the array, register `r2` holds the row of the element to retrieve, and register `r3` holds the column of the element to retrieve. Put the retrieved element in `f0`. The array dimensions are 256 rows \times 1024 columns. Each element of the array is a double precision floating point number.

Elements are arranged in memory in the following order:

$$a_{0,0} a_{0,1} a_{0,2} \cdots a_{1,0} a_{1,1} a_{1,2} \cdots a_{2,0} \cdots$$

where $a_{i,j}$ is the element at row i , column j .