Programming sprintf() - a Guide

Foundation

What sprintf() does is copy characters(bytes) from the format string to the output buffer, with a change in behavior whenever it sees a % character.

That means that the most important data items in the function are the two pointers: the current location in the format string, and the current location in the output buffer. Each one deserves to have its own $s register. Perhaps the input pointers $a0 and $a1 should be copied to $s6 and $s7, and the values of those $s registers should be maintained to have correct values for the entire invocation of sprintf().

Also, since sprintf()'s job is to copy one string to another, it must look a lot like the C library function strcpy(). The Index of the K&R book tells us to look at pages 105 - 106, where we find four C versions of that function. Choose one, and translate to MAL.

Superstructure

When sprintf() finds a % in the format string, it looks at the next character, and then adds some formatted output at the current position in the output buffer.

What are the kinds of formatted output?

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%d convert integer to decimal

Looks like printd(), discussed in class, and included in the file multmain.s, which is one of the files used in this homework assignment. So maybe it is named sprintd().

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%x convert integer to hexadecimal

Looks like printd(), so perhaps a semi-new function, perhaps called sprintx().

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%c include one character argument in result

Is it a function? Perhaps called sputc(), because it puts a char in a string??

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%s include string of characters in result

Looks like strcpy(), once again.

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%% include a percent sign in result

Perhaps it is a call to sputc(), with '%' as the argument.