

Assignment 02 - Exploring the "Run-time Execution Stack" (Due: Thursday March 7th)

For this assignment you are to recreate the illustration, from an earlier semester, presented in the file, FactorialIllustrationPrior.pdf. You are given the MS Word document file, FactorialIllustration.docx, and it is your task to modify and complete this document so that it illustrates those same source program components in execution, but at this time in Spring 2024. Note that since the "lower-levels" of the architecture are different than they were in the past, you can expect the details to be different, but for the structure to be essentially the same.

Thus, on the department servers you are to recompile and re-execute the program components, then copy and paste the resultant parts into the document file. Finally, you are to clearly and accurately format and place meaningful annotations (comparable to those shown in the given illustration) so as to demonstrate your recognition and understanding of the correspondences.

This assignment is really about recognizing and learning about the essential role of the Run-time Execution Stack in the processing of programs.

For this assignment **you are not to modify** FactorialRM.c or FactorialRF.c. Similarly, you are expected to maintain the structural format of the given FactorialIllustration.docx file, including effecting the relevant indentation.

Furthermore, although the given illustration uses the value 5 as input, in your illustration you are to use the value 7 as input. This will result in a deeper recursion and thus a little bit more work, but it should be insightful.

When you are finished you are to submit each of the following files to the corresponding DropBox on Brightspace.

- FactorialRM.s
- FactorialRF.s
- FactorialIllustration.docx

Good luck,
P.M.J.

Hint: Initially you may find it helpful to temporarily "comment out" the multiple calls to the DumpS subprogram appearing in the given source code files, and run the program so unadorned. You may find it clearer to see the program in action without all of the content from the RTES (Run-Time Execution Stack) presented in the output.

```
~/C250/AS02 $ pico FactorialRM.c
~/C250/AS02 $ pico FactorialRF.c
~/C250/AS02 $ cc -m32 FactorialRM.c FactorialRF.c -o FactorialRM
~/C250/AS02 $ ./FactorialRM
Enter an integer:7
7! is 5040
```