# CS3502 Project 01-Part III Fall 2022

# Setting up the OS Development Environment

# Learning Objectives:

## The purpose of this assignment is to continue the development examples of setting up an Operating System kernel.

## Submissions will be placed here and they will contribute to the total assignment grade of 100 points (+100 points for Bonus section).

## This is the kernel build process and constitutes the first module the Memory Management Routine, before a process can be created and scheduled the kernel must allocate (and own) a block of memory from which it can distribute memory to other processes:

**MEMORY MANAGER**

## Using the attached file 09\_memory.tar.gz

Q0: The page creation request has errors in kernel.c and in mem.c, modify them to allow it to compile, also to allocate 1024 bytes (1k) instead of 1000bytes. Correct the error where it allocates twice the amount each time. The paging begins at physical location 0x0000 where your kernel resides at 0x1000. Update it to begin at 0x2000 to avoid the kernel.

## After running make clean and make run, the result should be shown.

## Text Description automatically generated

Q1: Modify the page creation code to add a new command list (typed as list) which will show the allocated pages and their physical frame number. Each frame should be 1kb. This will require you to create a page, store the data-structure you choose into that page. This data structure will maintain the other pages. The kernel is at frame 1. System data should be stored in frame 0. Request three pages and show a screenshot.

Q2: Modify the page creation code to allocate a page to a specific physical frame. page0 will allocate to frame 0. page1, frame 1… up to - pagef, frame 15 (hex 0x0F). Or you may submit as two arguments (you’ll need to add a way to accept and interpret two arguments like “page 1”.

Q3: Modify the page creation code to remove an allocated page from the list and write it memory values all to zero. del0 (or del 0), del1 … delf to delete page 0, 1 or 15 (hex 0x0f) respectively. Show a screenshot making the request page2, page3, page4, delete3 and then “list”

1. What happens when page 0 is “deleted”, what if anything happens when page 1 is deleted?
2. What happens when you request “page” at least 11 times in a sequence? What is the error you see here? What is this error?

**50 points**

**Next module Process Creation and Scheduling**

## **QUESTIONS**

## **For the interested, see the guide website I used as a template for this: https://github.com/cfenollosa/os-tutorial**

**Submission Guidelines:**

* No handwritten submission is accepted, always submit within this document file. Exception, If you are submitting code, submit as an ASCII formatted text file such as .java, .py, .cpp, .cs etc. or even .txt. NO ZIP FILES.
* You may include your freehand drawing/image and handwritten scans in the submission. However, the writing and images must be clearly legible.  If I notice them as illegible to me prior to the due date I will let you know to provide clearer version.  This will not change the due date.  It is best to present non-handwritten submissions, generally, as is done in the professional setting.
* Show all work/calculations.
* **Please complete your entire work in a single Word Document and Save the file as: yournetid\_CS3502\_Project0X.docx; otherwise, 25% points will be deducted. For instance, I would save my file as: ogarcia5\_CS3502\_Project0X.docx. Then upload your file in D2L.**
* Please observe the submission due date and time. After the due date there is a 50% penalty for the next 24 hours. Any submission after 24 hours of the due date will be graded at 0%.
* If you include a reference or an image taken from other sources, please cite them appropriately. APA is preferred, but cite them so they can be found.
* If you resubmit, please make sure to attach the file again. Your latest submission before the due date will be graded.
* **There is NO extended deadline for this assignment.**