

## PA3 – Memory System: Part A

### Due Date

- See Piazza for due date and time
  - Grading the next day
- Submit program to perform in your student directory
  - Sub directory called:
    - /PA3/...
  - Fill out your **PA3 Submission Report.pdf**
    - Place it in the same directory as your solution
    - Enter the final Changelist number of your submission
    - Enter the number of test passed
      - Part A: requires 6 tests to be passed from the supplied tests
    - Write up a quick discussion in the report
      - What you learned from this assignment so far

### Goals

- Learn
  - To Create a Memory System from scratch
- Understand the internals of a memory system

### Assignments

#### 1. **Create a memory system within a heap**

- Take the given memory system framework for the heap layout:
  - Add the allocators
  - Add the de-allocators
- Run the Test functions that handles a set of memory allocation and de-allocations
  - Supplied by Instructor
  - Part A: tests 1-6 minimum, you can do more
- Diagram the data structure layout out - to help you.

#### 2. **Take Memory system, use the stress test**

- Measure the timing with default setting in the compiler
  - For the original memory system
  - For your custom memory system
- Measure the difference.
  - Write the before and after in an output text file
- Instructor will provide the stress test
  - Intended for Part B
  - Provided to let you a jump start on Part B

**General:**

- Write all programs in cross-platform C or C++.
  - Optimize for execution speed and robustness.
- Create a programming file for each problem, for example
  - Student directory
    - /PA3/memory/...
  - Make sure that each problem can be compiled and run through the checked in solution
- Do all your work by yourself
  - Feel free to talk with others about ideas and problems
  - But do not copy your friend's code.
    - Please don't - I can tell with my difference tools
  - Feel free to share ideas
- Check in the problems multiple times
  - At least 3 times per problem
    - For this project it might be closer to 40
  - Have reasonable check-in comments
  - Seriously, I'm checking
- Make sure that your program compiles and runs
  - Warning level 4, some times that is not possible due to MS headers...
  - Your code should be squeaky clean.
- We are using Perforce
  - You should have received the document describing how to login.
    - Please look at the documentation and videos under the reference directory
  - Submit program to perforce in your student directory
    - Sub directory called: /PA3/...
      - As described above
  - All your code must compile from perforce with no modifications.
    - Otherwise it's a 0, no exceptions
  - Only Visual Studio 2012 allowed

### Validation

*Simple check list to make sure that everything is checked in correctly*

- Do they compile and run without any errors?
- Submitted it into /PA3 directory?
- Did you do the submission report?
- Can you delete you local drive, regrab the PA3 directory?
  - Is all the code there?
  - Does it compile?

### Hints

Most assignments will have hints in a section like this.

- Do many little check-ins
  - Iteration is easy and it helps.
  - Perforce is good at it.
- Look at the lecture notes!
  - A lot of good ideas in there.
  - The code in the examples work.
- Use the Piazza
  - This is much harder than the last assignment.
  - See me during office hours.
  - Read, explore, ask questions in class