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## CS 421: OutLab: MPI Custom Datatype: Enemies!

- Released: Thursday March 29. Due: Thursday April 5 11:55 AM
- Please do not forget the honor code.

### Overview

This is an individual assignment. Any discussions should be constrained to public Piazza postings. You are not to discuss with ANY other person (same class, same batch, different batch, unknown person, ...). The only exception is your professor.

This is a simple assignment on a “must know” concept in MPI.

### Task

You are beginning to write a multi-player multi-processing game. As starters, MPI process 0 creates lots of enemies (sigh!) of the following type

```
struct enemy {  
    int count;                // num of units 1 to 20  
    int location[20][3];      // location of units x,y,z  
    char type[20];            // one of 'a,b,c,d,e'  
    double experience;        // experience of enemy 0-20 yrs  
    double strength;          // 0-100, 0 -> dead, 100-> full  
    int supplies;             // number of days  
    double fuel;              // obvious  
    int stance;               // 0-10, defensive to offensive  
};
```

Zero wants to send information of this sort of enemy to other processes, but sending individual items of the enemy is tedious and will incur multiple communication overheads.

Your goal is ensure that processes receive information of each enemy in a **single** MPI\_Recv call. Complete the function `student.cpp` at the URL provided.

### Reflection Essay

As usual, explain what you have learnt in this assignment. Explain what you think is the benefits of doing the communication the way this task asks you (be specific). What alternatives can you think of, and the pros/cons of these. Take time to write your reflection essay.

### Submission Guidelines

As always, stay tuned on Piazza for clarifications.

### How We Will Grade You

For the code, we are not planning to give you partial marks on this assignment. So please make sure you get everything sorted out before you submit. It is all or none.

For the reflection essay, there will be partial marks.

Also, don't forget to include your reflection essay, your honor code, and a working makefile.

Don't change things in any file except `student.cpp` (reports any snafu on Piazza).

1. Do include a `readme.txt` (telling me whatever you want to tell me). Do include group number, honour code, citations, etc.
2. As mentioned, your submissions must also appear on GitHub. Do make frequent commits – just change your compile command to include a commit.
3. Your submission should look something like

```
lab04_groupXY_outlab
├── readme.txt
├── reflections.txt
├── makefile
├── outlab.cpp
├── data.hpp
└── student.cpp
```