

# Homework #01

데이터사이언스를 위한 컴퓨팅 1 (2022년도 2학기, M3239.005500)

Due: 2022년 9월 23일 (금) 23시 59분

## 1 Compilation Process [40pts]

`pow.c` gets 2 floating numbers as the arguments to calculate  $x^y$ . The usage of the program is

`pow x y`

(Note: In C or C++, arguments are passed using `argc` and `argv` arguments in the main function.)

### 1.1 Preprocessing [30pts]

- `pow.c` includes 3 header files (`stdio.h`, `stdlib.h`, `math.h`), but we didn't write the file. Please find these 3 files. Report the file path. (Hint: use "`cpp -v /dev/null`" to know the settings in C preprocessor `cpp`.)
- Find a `gcc` option to run preprocessing and run it with `pow.c`. In the preprocessed results, please find the function declaration of `pow` and `printf`. Please copy and paste them into the report.
- Does preprocessed result have `pow` and `printf` implementation? If the implementations are included, please explain the code briefly. If not, please explain why they are not implemented.

### 1.2 Compilation [10pts]

- Find a `gcc` options 1) to compile `pow.c` to produce `pow.o` and 2) to link `pow.o` with libraries and produce `pow`.

## 2 C++ Programming Practice [60pts, NO partial credit]

Consider three different types of bears, Polar bear, Grizzly and Black bear. Polar bear is known to be the most aggressive, and then Grizzly and then Black bear.

- Instead of meanness, now calculate aggressiveness. The degree of aggressiveness is `weight * x`, where `x=1, 0.9, 0.7` for Polar, Grizzly and Black bears, respectively.
- Consider a black mommabear, which can have two cubs as max. When there are cubs, the aggressiveness becomes twice.
- Total aggressiveness of mommabear can be calculated as the sum of the aggressiveness of mommabear and cubs.
- As same as in the bear example, the bear class have

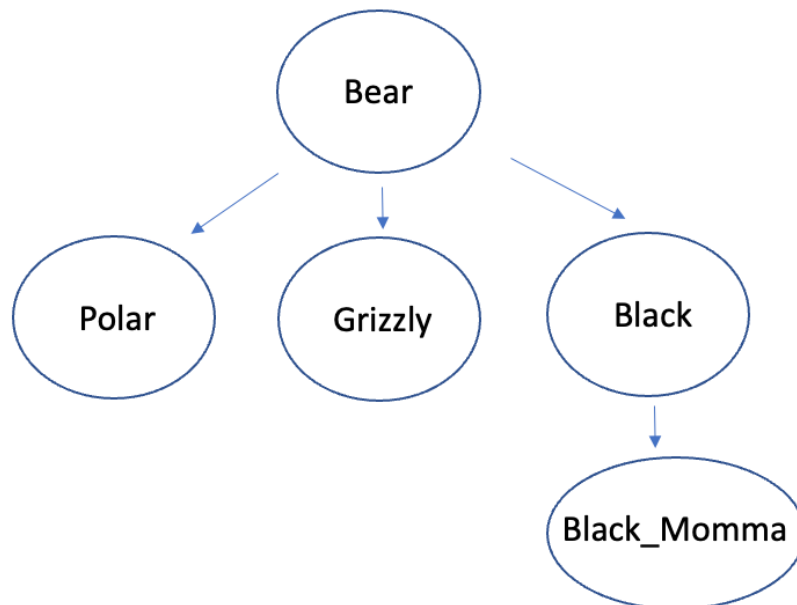
a. `Weight` (member variable)

- b. `GetWeight`
- c. `SetWeight`
- e) Additionally, have
  - a. `void PrintSelf(void)`
  - b. `void AddCub(Bear *aCub)` (Mommabear only, add cubs)
- f) `PrintSelf` prints
 

I am {Bear type}, Weight={weight}, Aggressiveness={aggressiveness}

or (in the case of mommabear)

I am {Bear type} with {# of cubs} cub(s), Weight={weight},  
 Aggressiveness={aggressiveness}, Total Aggressiveness={totalaggressiveness}



### Implementation:

Add all code related to class definition to `NewBear.h` and all implementation to `NewBear.cpp`. `main.cpp` have a test code.

`Makefile` is provided to help compilation and job scheduling. Please compile and run it at GSDS server. You can run test code by running “`make test`”. Below is the results.

```

cfdsta@login0:~/HW1$ make test
salloc --nodes=1 --ntasks-per-node=1 --time=5 --cpus-per-task=1 --mem=1G ./bear
salloc: Granted job allocation 1849
I am Polar bear, Weight=450, Aggressiveness=450
I am Grizzly bear, Weight=300, Aggressiveness=270
I am Black Mommabear with 2 cub(s), Weight=100, Aggressiveness=140, Total Aggressiveness=189
salloc: Relinquishing job allocation 1849

```

### 3 Submission Instruction

- Compress `report.pdf`, `NewBear.cpp`, `NewBear.h` as a single file and report it to ETL.
- You cannot change `main.cpp` and `Makefile`. You don't need to submit them.
- The file name you submit should be `YOUR_ACCOUNT_HW01.zip`. (ex: `cfds123_HW01.zip`)
- Your code will be scored automatically by the program. If you don't follow the submission instruction, a penalty may occur.
- If you want to use your grace day, you must notify the TA by e-mail ([kisung.nam@snu.ac.kr](mailto:kisung.nam@snu.ac.kr)) when submitting the homework. If you don't notify, we will judge that you want to save your grace day for the next homeworks, so your homework is considered unsubmitted. Even if you use your grace day, your homework should be submitted through ETL.