Today's plan

- Class interactions
  - Names of programming languages
  - Keys concepts
  - Recap discussion
- Class exercises
  - Ex1-1 on
    https://www.onlinegdb.com/online_c_compiler

Names of programming languages

- Fortran?
  - FORMula TRANslator
- Python?
  - from the comedy show "Monty Python's Flying Circus", a show the creator was watching
- Java?
  - from Java coffee, something cool, unique, easy to spell, and fun to say
- PHP
  - it was Personal Home Page, but now Hypertext Preprocessor
- C?
  - because it came after B
  - Fortran $\rightarrow$ ALGOL $\rightarrow$ (B)CPL$\rightarrow$ B$\rightarrow$ C$\rightarrow$ C++$\rightarrow$ D$\rightarrow$ Go
  - C++ $\rightarrow$ C $\rightarrow$ Java $\rightarrow$ E
  - Fortran $\rightarrow$ F

Key concepts

- The hello world program:

```
1  #include <stdio.h>
2  int main(void) {
3      printf("Hello world!\n");
4      return 0;
5  }
```

- preprocessor: process '#' and put all source codes together
- compiler: source codes to object codes
- linker: object codes to executable (machine codes)
- printf, scanf: using %d, %u, %f, %c, %s etc.
- primitive types: int, long, float, double etc.
- const: make variable not modifiable
- **undefined behavior** (nasal demons): unpredictable
- arithmetic operators: $+ - */\%$, caution for integer division!
- operator precedence: which execute first?

Recap questions

❶ The command to compile a C program is:
`gcc hello_world.c -std=c99 -pedantic -Wall -Wextra`,
use `man` or Google, find out what do the four flags mean?

❷ Briefly describe what a preprocessor, compiler, and linker do when transporting C code into executable?

❸ What does an **undefined** behavior mean in programming? Do we need to care about it? Why or hwy not?

❹ What does the modifier `const` mean?

❺ What are the primitive types in C and what are their byte sizes?

❻ What is the value of `7 / 2` (a division of two integers) in a C program?

❼ Is `i=i++` a well-defined expression in C?

Class exercises

Ex1-1: https:
//jhu-ip.github.io/cs220-sp21/docs/exercises/ex1-1/