Programming in C++

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Basic information

- Web https://fan1x.github.io/cpp21.html
- ZOOM for distance learning
  - https://cuni-cz.zoom.us/j/94350923737
  - Credentials in SIS/mail
- Mattermost
  - Invite link: https://ulita.ms.mff.cuni.cz/mattermost/signup_user_complete/?id=z1knw5ag6p8nipop1i7iciga6a
  - Channel: `nprg041-cpp-english`
- Gitlab
  - https://gitlab.mff.cuni.cz/
  - https://gitlab.mff.cuni.cz/teaching/nprg041/2021-22/eng

Labs credit

- Submitted homeworks before Monday midnight (to Gitlab)
  - Even if not attending!
- Two large homeworks in ReCodex (40 points)
  - Smaller – 15 points, November
  - Larger – 25 points, December
- Software project
  - Topic: 28/11/2021
  - First submission: 24/4/2022
  - Final submission: 22/5/2022

Code Requirements

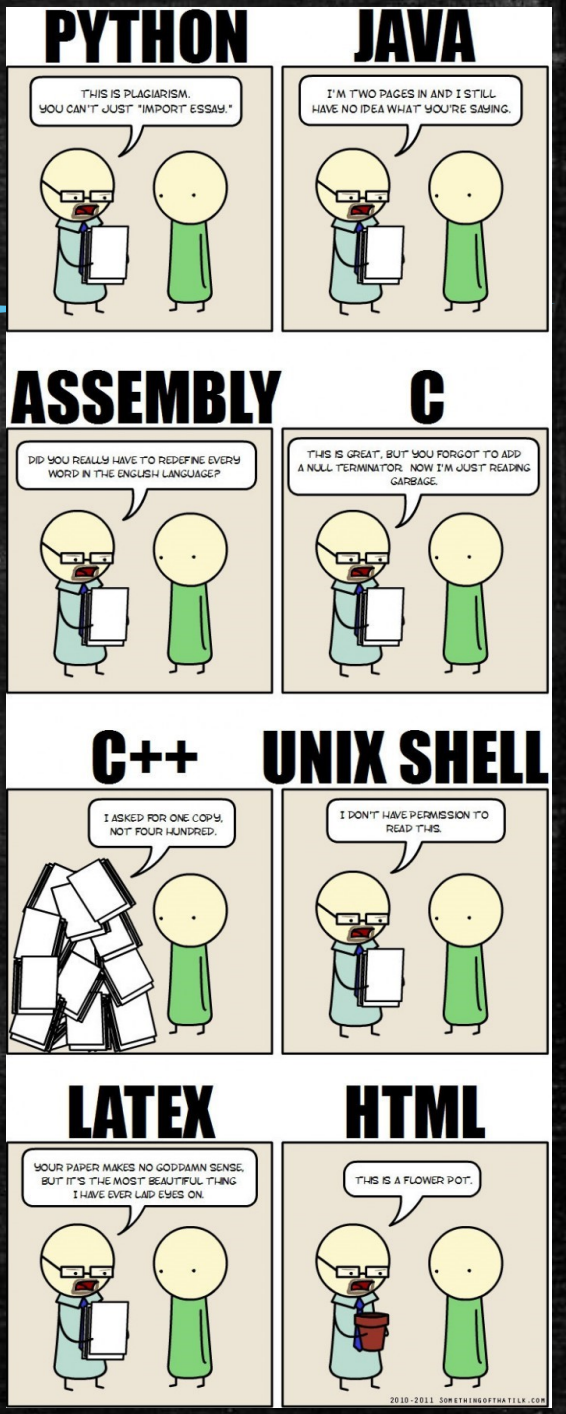
- Consistency
- Cleanness, readability
- Safety
- Modern
- Working

Why C++

"C makes it easy to shoot yourself in the foot. C++ makes it harder, but when you do, it blows away your whole leg."
-- Bjarne Stroustrup

"It was only supposed to be a joke, I never thought people would take the book seriously. Anyone with half a brain can see that object-oriented programming is counter-intuitive, illogical and inefficient."
-- Stroustrup C++ 'interview' (https://www-users.cs.york.ac.uk/susan/joke/cpp.htm)

C++ != speed



Working Environment

- IDE
  - Visual Studio (https://portal.azure.com/...)
  - VS Code
  - Clion
  - Code::Blocks
  - Eclipse
  - ...
- Compilers
  - MSVC, GCC, Clang+LLVM, ICC, ...

C++ (interesting) links

- Reddit, Slack, ...
- https://en.cppreference.com/w/
- http://www.cplusplus.com/
- http://isocpp.github.io/CppCoreGuidelines/CppCoreGuidelines
- https://www.youtube.com/user/CppCon
- https://isocpp.org/
- http://www.open-std.org/jtc1/sc22/wg21/docs/papers/
- https://gcc.godbolt.org/
- ...

Hello World

```
#include <iostream>
#include <string>

int main() {
  std::string name;
  std::cin >> name;
  std::cout << “Greetings from ” << name << std::endl;
  return 0;
}
```

More Complex Program

```
#include <iostream>
#include <string>
#include <vector>

using namespace std;

int length(const string& s) { ... }

void pretty_print(const vector<string>& a) {   ... a[i] ...  }

int main(int argc, char** argv) {
  vector<string> arg(argv, argv+argc);
  if (arg.size() > 1 && arg[1] == "--help") {
    cout << "Usage: myprg [OPT]... [FILE]..." << endl;
    return 8;
  }
  pretty_print(arg);
  return 0;
}
```

Homeworks

1. Hello World
2. A greeting program (use names from arguments)
   - `hello.exe Adam Eve` → `Hello to Adam and Eve`

   ! Args[0]
3. Summation of numbers from arguments
   - `sum.exe 1 2 3 4 5` → `15`
   - `stoi(), stod(), stoX()`
4. A simple calculator (only for operations +-)
   - `calc.exe 1+2+3-4` → `2`
   - to Gitlab