CS 32 Bootcamp

02—CS 31 Review

Agenda

- Diagnostic mention: undefined behavior
- Control flow
- Functions
- Vectors
- Strings
- Pointers
- Homework 1

Undefined behavior

- What does undefined behavior mean?
- Undefined behavior
  - `std::cout << arr[-1];`
- Implementation-defined behavior
  - Size of int is 32 bits
- Throwing an exception
  - File not found

Control flow

```
for (int i = min; i < max; i++) {
    foo();
}
```

```
while (some_boolean_condition) {
    foo();
}
```

```
if (condition_1) {
    foo();
} else if (condition_2) {
    bar();
} else {
    baz();
}
```

Functions

- Function signature
  - `int my_function(std::string s, int n);`
- Declaration vs. definition
  - Declaration in header (.h) files
  - Definition in source (.cpp) files

Vectors

- Contiguous elements: fast lookup, fast append, slow insertion

```
std::vector<int> my_int_vec;
my_int_vec.push_back(5);
my_int_vec.push_back(6);
std::cout << my_int_vec[1];
```

Strings

- Basically a vector of characters
- You can compare strings using ==
- You can concatenate strings using +

Pointers

- Address of a variable
- Why do we want pointers?
  - We want a function to operate on an existing object
  - We want to avoid copying large amounts of data
  - We want to connect objects together (e.g. linked list)
- Pointers vs. references

```
std::vector<int> x;
std::vector<int> *y = &x;
y->push_back(5);
std::cout << x[0];
```

```
std::vector<int> x;
std::vector<int> &y = x;
y.push_back(5);
std::cout << x[0];
```

Homework 1

- Due this Saturday
- Download skeleton from course website
- Submit on Gradescope
- We will be adding test cases throughout the week, so don't be surprised if the Gradescope changes
- Feel free to ask questions on Discord or during office hours!