

Black-box

A mini-lecture series

CSE498 Collaborative Design (W) - Secure and Efficient C++ Software Development

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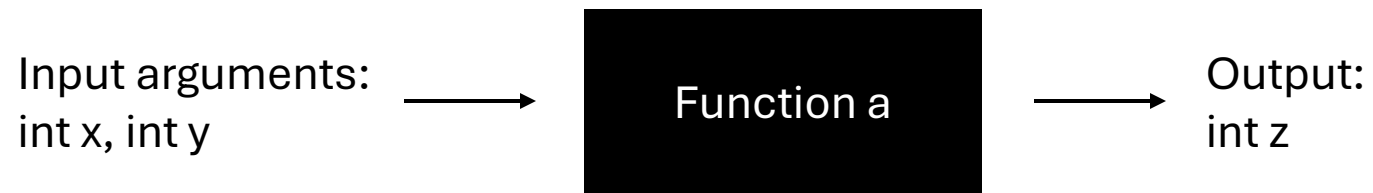
Black-box vs White-box

- Usually used in a testing context, but also system design
- Sometimes, AI or machine learning models are called black-box
- White-box means you have full access to the code
- Black-box means you do not have any information on the code
 - Focuses on the system's *external observable behaviour*
- In other words: view the system in terms of the inputs and outputs
- Input Transformation

Examples

- Connect to a web
 - Order ramen at a restaurant, do you care how they make it?
 - Type in google.com into firefox, do you care what happens under the hood?
 - Get on a train from Lansing to Chicago?

Black-box model of a function



Some magic occurs here

Black-box model of a function

- When you develop a function, you can see its whole content
- But other people sees that function as a black-box entity
- They may include the .h file associated
 - They won't see the code itself
- What do you care about when you import a function?
 - Functionality?
 - Efficiency?
 - How the code was written?

Why is it important to view it as black-box?

- A person who uses the program or function should not need to know how it is coded
- **Procedural Abstraction**
 - A developer using your function should not access to code body to see how it works
- This is also known as information hiding

Advantages

- Allows you to use a test-driven development approach effectively
 - Testers do not need technical knowledge, focus on what types of output should the system return given certain inputs
- Modularity
 - Forces you to break apart your code into reasonable pieces
 - Each piece should serve a single objective



Persons of the day

Dennis Ritchie, Ken Thompson, and Brian Kernighan (and the rest of bell labs)

- Creator of the C language and the UNIX operating system
- Development started in 1970s in Bell labs
- How did C++ get its name?
- 1967 - Basic Combined

Programming Language (BCPL)

➔ 1969 - B [Ritchie and Thompson]

➔ 1972 - C [Ritchie and Kernighan]

➔ 1985 - C++ [Stroustrup]