

EECS 22L: Software Engineering Project in C Language

Lecture 11

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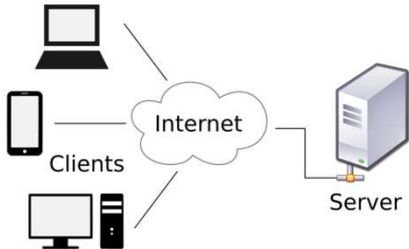
The Henry Samueli School of Engineering
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Lecture 11: Overview

- Project 2 Technical Discussion and Advise
 - Client-server software architecture
 - Event-based GUI programming
 - GTK clock server example
- Towards Object Oriented Programming in C++
 - Introduction to C++ concepts from the C perspective
 - Introduction to classes, objects and strings

Project 2: Software Architecture

- Client-Server Software Architecture
 - Software applications communicating via the Internet



Source: David Vignoni (LGPL, wikipedia.org)

- Server: provides a service function to one or more clients
- Client: initiates requests for service
- Internet: communication network to exchange messages

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Project 2: Client-Server Communication

- Multiplexing multiple client connections with `select()`
 - ClockServer example: `~eecs22/ClockServer.tar.gz`

ClockClient

ClockServer

socket()
connect()
write()
read()
close()
exit()

select()
read()
write()
close()
exit()

connect (red dashed arrow)

read (red dashed arrow)

accept() (red dashed arrow)

data (blue arrow)

time-out (blue arrow)

printf() (blue arrow)

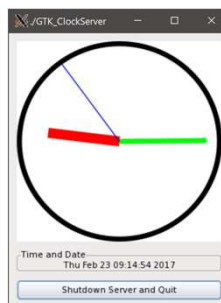
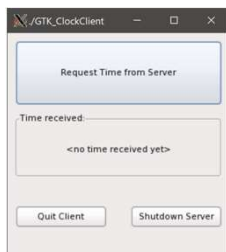
fflush() (blue arrow)

- Wait simultaneously to connect, to transfer data, or for time-out!
- Keep sequential execution short
- Limit client-server interaction to one request at a time

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Project 2: GUI Programming

- GUI clock server example:
 - `~eecs22/GTK_ClockServer.tar.gz`
 - `GTK_ClockClient.c`
 - `GTK_ClockServer.c`
 - `Makefile`, `README`
 - Discussion of main loops



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Object Oriented Programming

- Towards Object Oriented Programming in C++
 - C++ can be seen as “incremented” or “improved” C
 - C++ offers a number of new features, including:
 - Inline functions
 - References
 - Default arguments
 - Function and operator overloading
 - Classes and objects
 - Member functions (methods)
 - Constructor and destructor
 - Class and function templates
 - Class inheritance
 - Polymorphism
 - Exception handling

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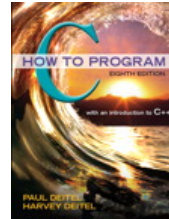
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Object Oriented Programming

- Brief Introduction to C++
 - Selected slides from supplemental text book:

Paul Deitel, Harvey Deitel,
“C: *How to Program*”,
Eighth Edition,
Prentice Hall, 2013.



- Excerpts from Chapter 16:
Introduction to Classes, Objects and Strings