SE3910 – REAL TIME SYSTEMS

ROADMAP

- Today
  - Gstreamer and OpenCV Introduction
    - Image processing / image handling
- Friday
  - Introduction to Qt
- Monday
  - Exam Review
- Wednesday
  - Midterm Exam

Next week

OBJECTIVES

- Explain the purpose for the GSTREAMER libraries
- Define the concept of pads, bins, and piplines
- Compare and contrast source, sink, and filter elements
- Explain how a pipline can be graphically represented
- Explain how we can use an oscilloscope to measure execution time of a method

WHAT IS GSTREMER

- Gstresmer is a pipeline-based multimedia frameowkr written in the C programming language with a type based on the Gobject concept
- Allows a programmer to create a variety of media-handling components
  - Audio playback
  - Audio and video playback
  - Recording
  - Streaming
  - Editing
- Pipeline concept allows easy creation of new features and functionalities

GSTREAMER STRUCTURE

Built/test w/ gstreamer tools

Built by hand using multimedia applications

gstreamer tools

gst-inspect
gst-launch
gst-editor

multimedia applications

media player | VoIP & video conferencing | streaming server | video editor | (...)

gstreamer core framework

pipeline architecture

media agnostic
base classes
message bus
media type negotiation
plugin system
data transport
synchronization

moving

protocols	sources	formats	codecs	filters	sinks	
- file: - http: - rtsp: - ...	- alsa - v4l2 - tcp/udp - ...	- avi - mp4 - ogg - ...	- mp3 - mpeg4 - vorbis - ...	- converters - mixers - effects - ...	- alsa - xvideo - tcp/udp - ...	3rd party plugins

inputs

"Bob"

gstreamer plugins

gstreamer includes over 250 plugins

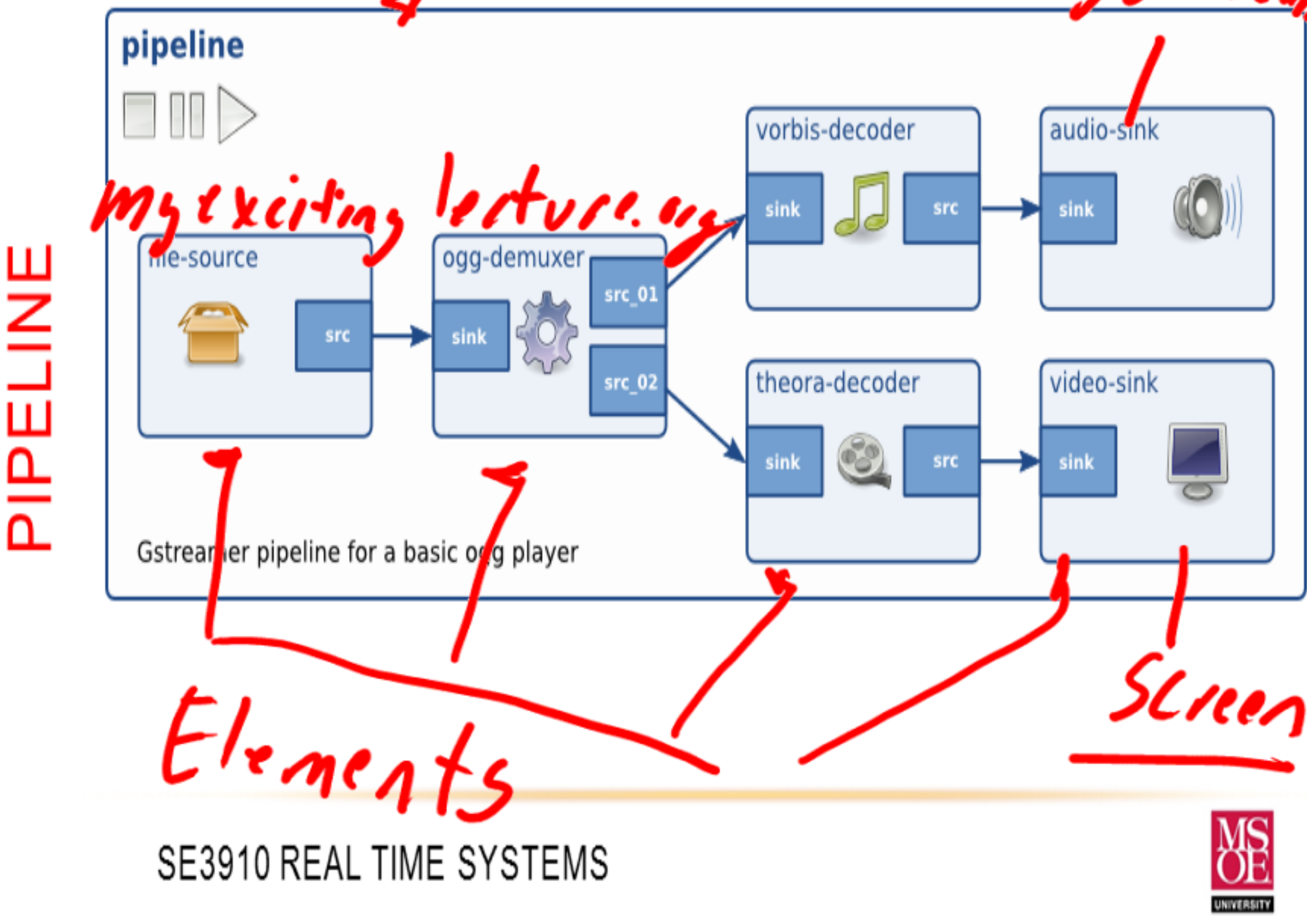
SE59 TO REAL TIME OPERATING SYSTEMS

MSOE UNIVERSITY

ELEMENTS, PADS, BIN, AND PIPELINES

- Element
  - The most important class of objects in Gstreamer
  - One specific function for each element
  - Chained together to solve a problem
- Pads
  - Elements inputs and outputs
  - Where connections are made with other elements
  - Source pads – Where data comes from
  - Sink Pads – Where data is sent
- Bin
  - A container for a collection of elements

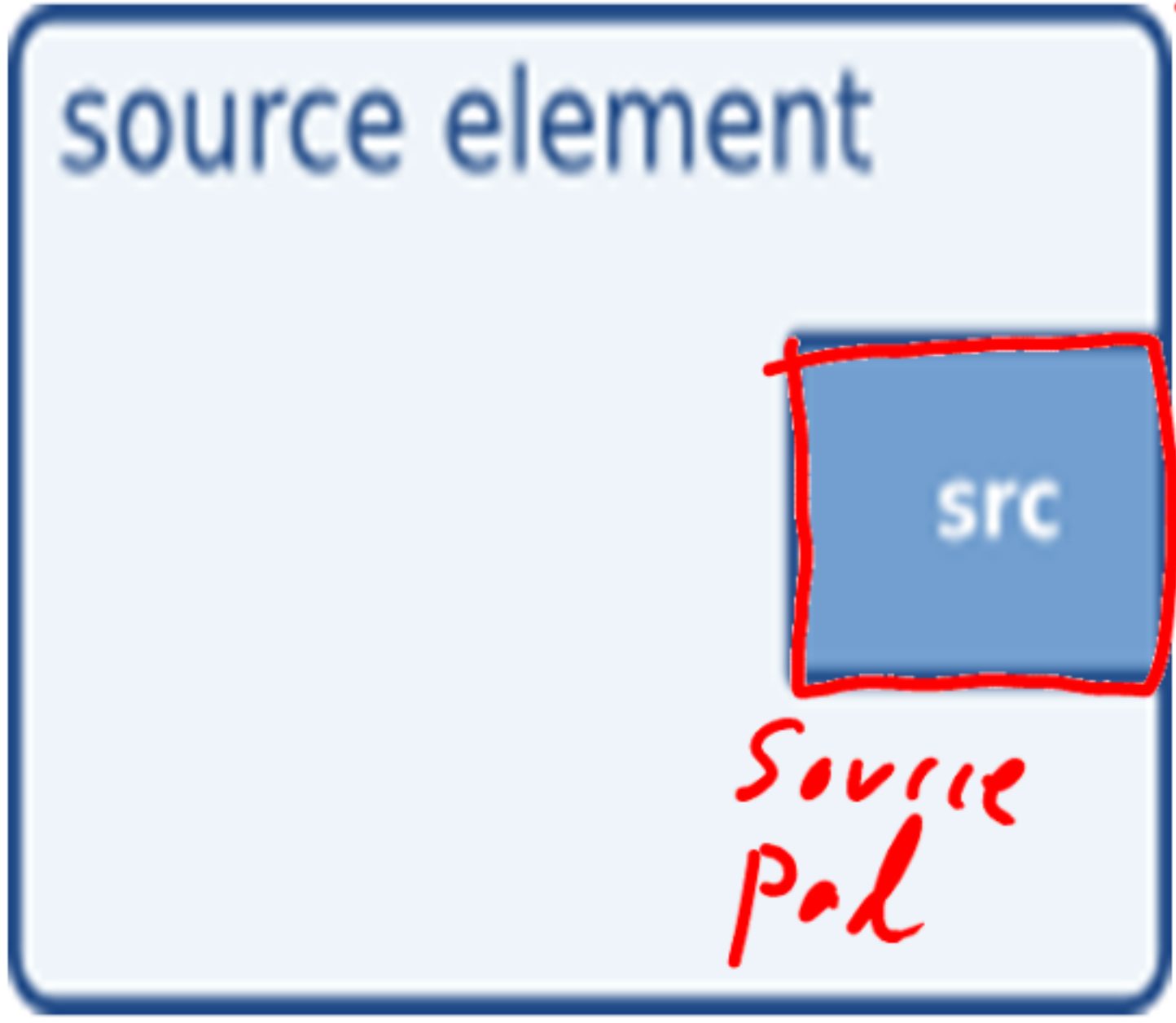
- A top level bin



PIPELINE

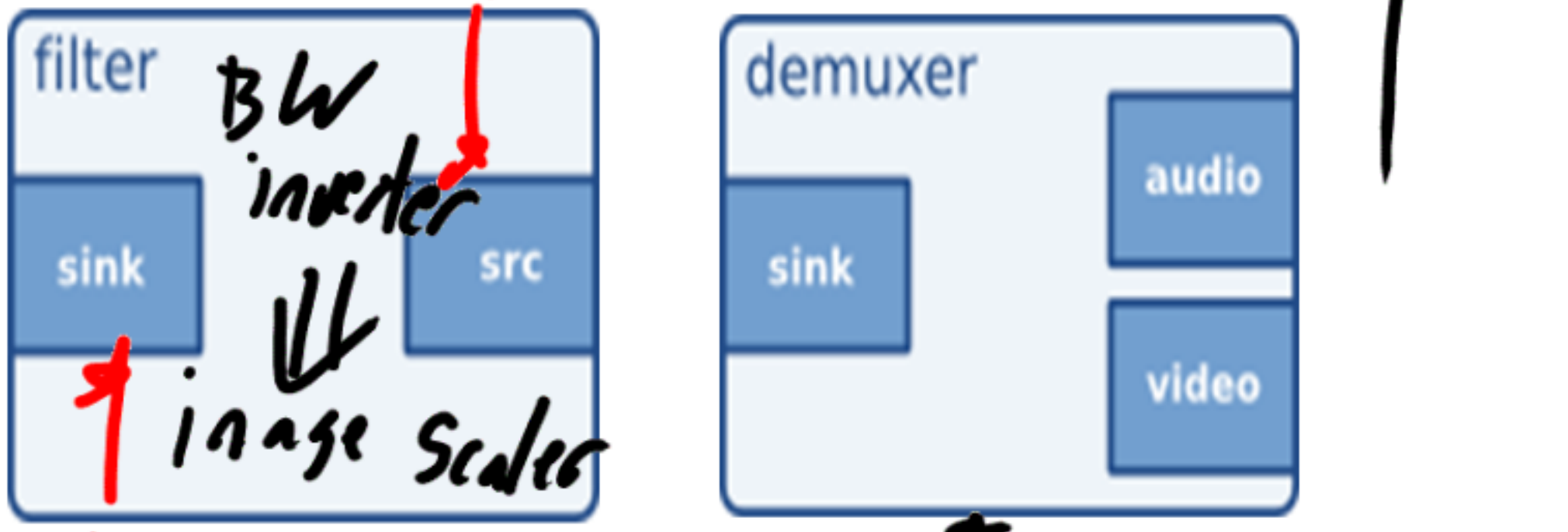
SOURCE ELEMENTS

- An element used by a pipeline to read from an input
  - They do not accept data, only generate it.



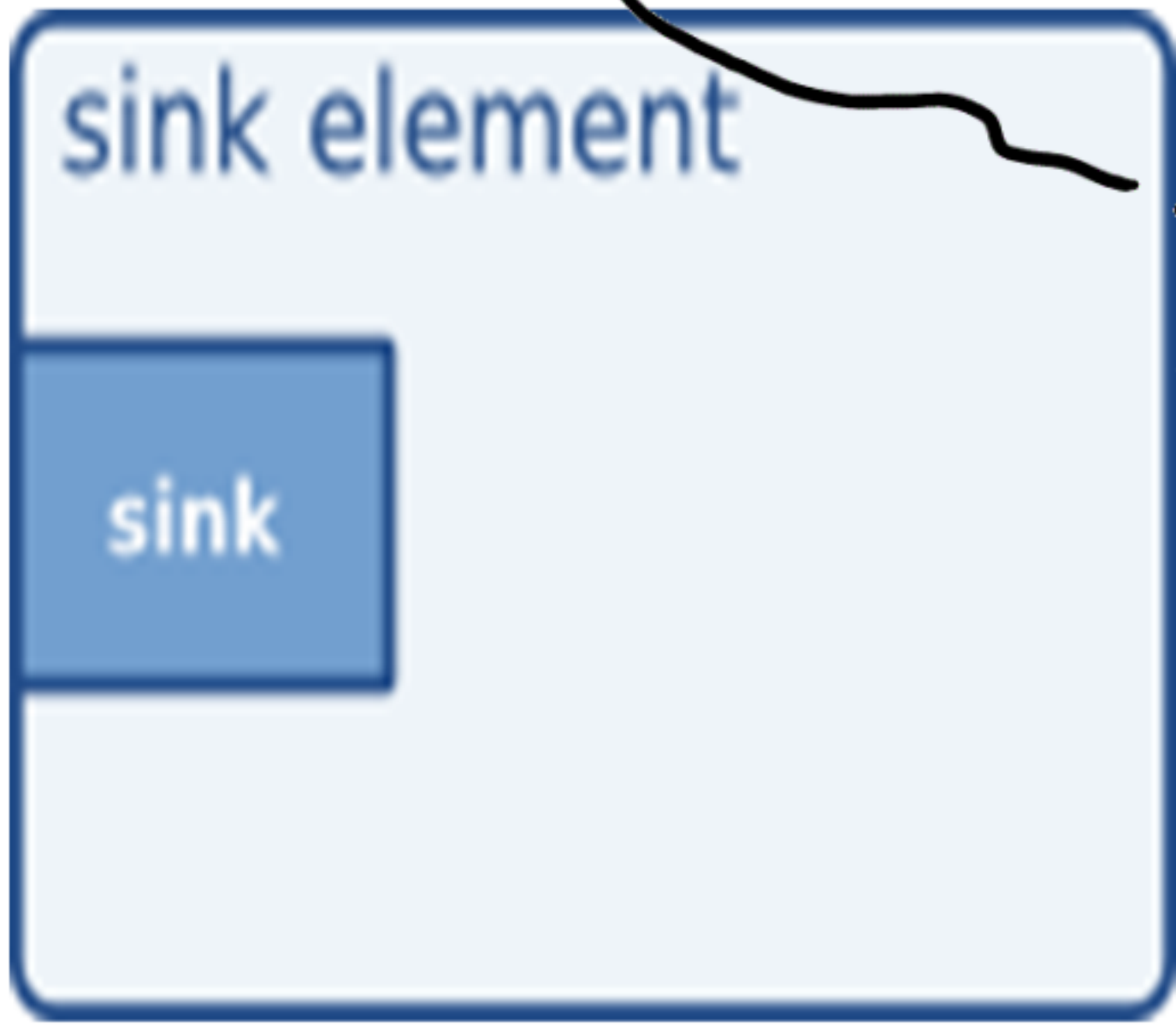
FILTER ELEMENT

- Have both inputs and outputs
- Translate data from one form to another
- May have any number of source and sink pads



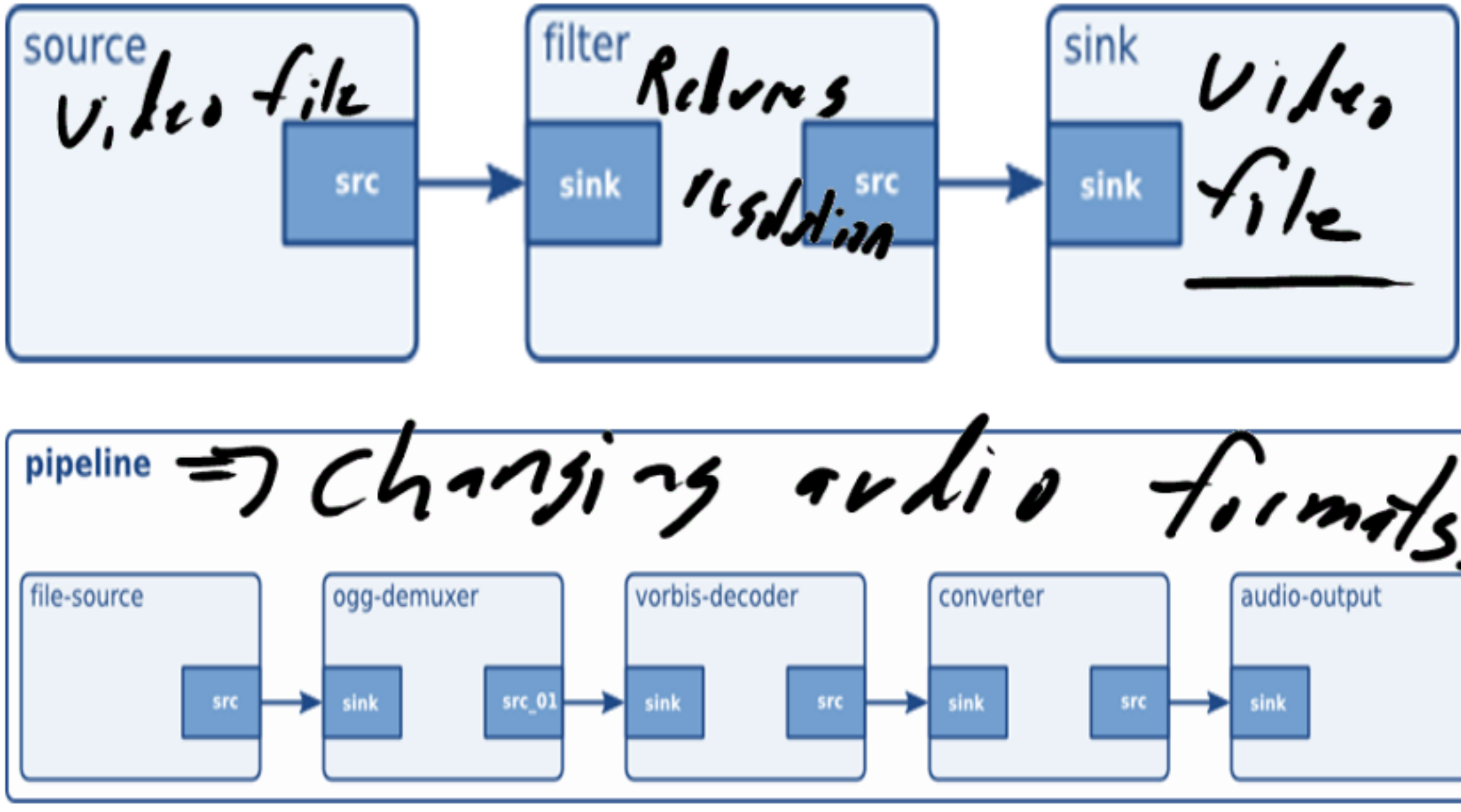
SINK ELEMENT

- Endpoints on a pipeline ⇒ where data flows
  - Accept data but do not produce anything.



anything relative to the pipeline

AN EXAMPLE PIPELINE



MEASURING EXECUTION TIME OF A METHOD

"Wall time"

hello()

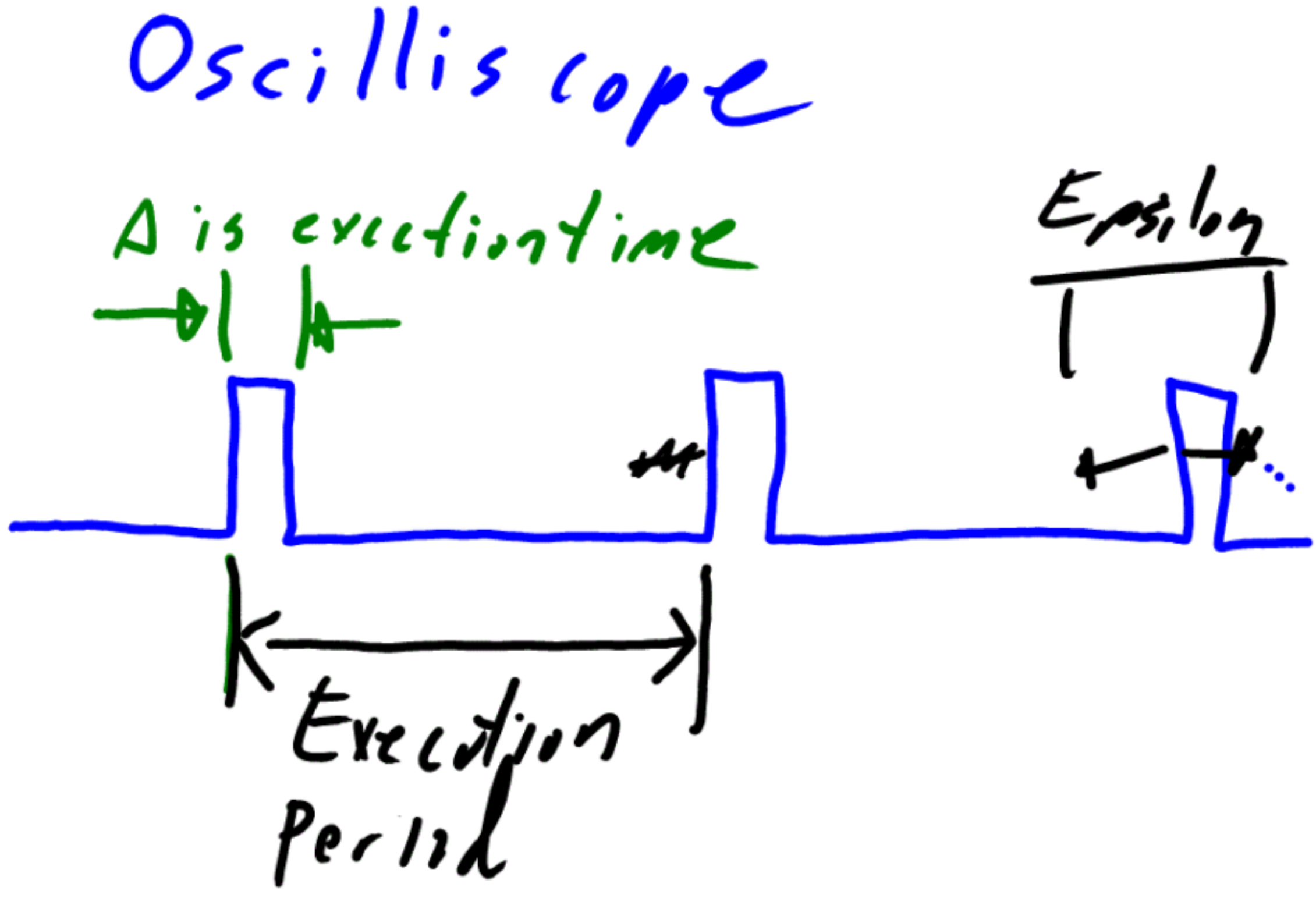
"turn pin on"

At

"turn pin off"

Wall time

execution time

How long we spend on the processor.

MEASURING EXECUTION TIME OF A METHOD