

# Audio Programming with Chuck

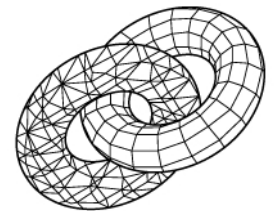
## Session 1: Basics: Sound, Waves, and Chuck Programming

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impa



VisgrafLab

# Mini-course Schedule

Today	Session 1: Basics: Sound, Waves, and ChuckK initiation
10/01/2019	Session 2: ChuckK Libraries and Arrays
15/01/2019	Session 3: Sound File Manipulation
17/01/2019	Session 4: Functions
22/01/2019	Session 5: Unit Generators and Physical Models
24/01/2019	Session 6: Multi-Threading and Concurrency
29/01/2019	Session 7: Classes and Object-Oriented Programming

# Session 1: Basics: Sound, Waves, and Chuck initiation

Chuck introduction

Download and Installtion

Hello sine

Data types and variables

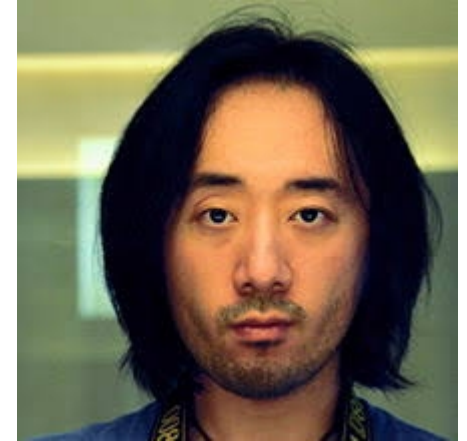
Time in Chuck

Control Structures: If and Else

Control Structures: For and While

# Chuck Intro

- Ge Wang
- Designed around time => now
- Parallel logic
- Simple-text => easy to read
- Real-time sound synthesis
- MIDI compatible



# Download and Installation

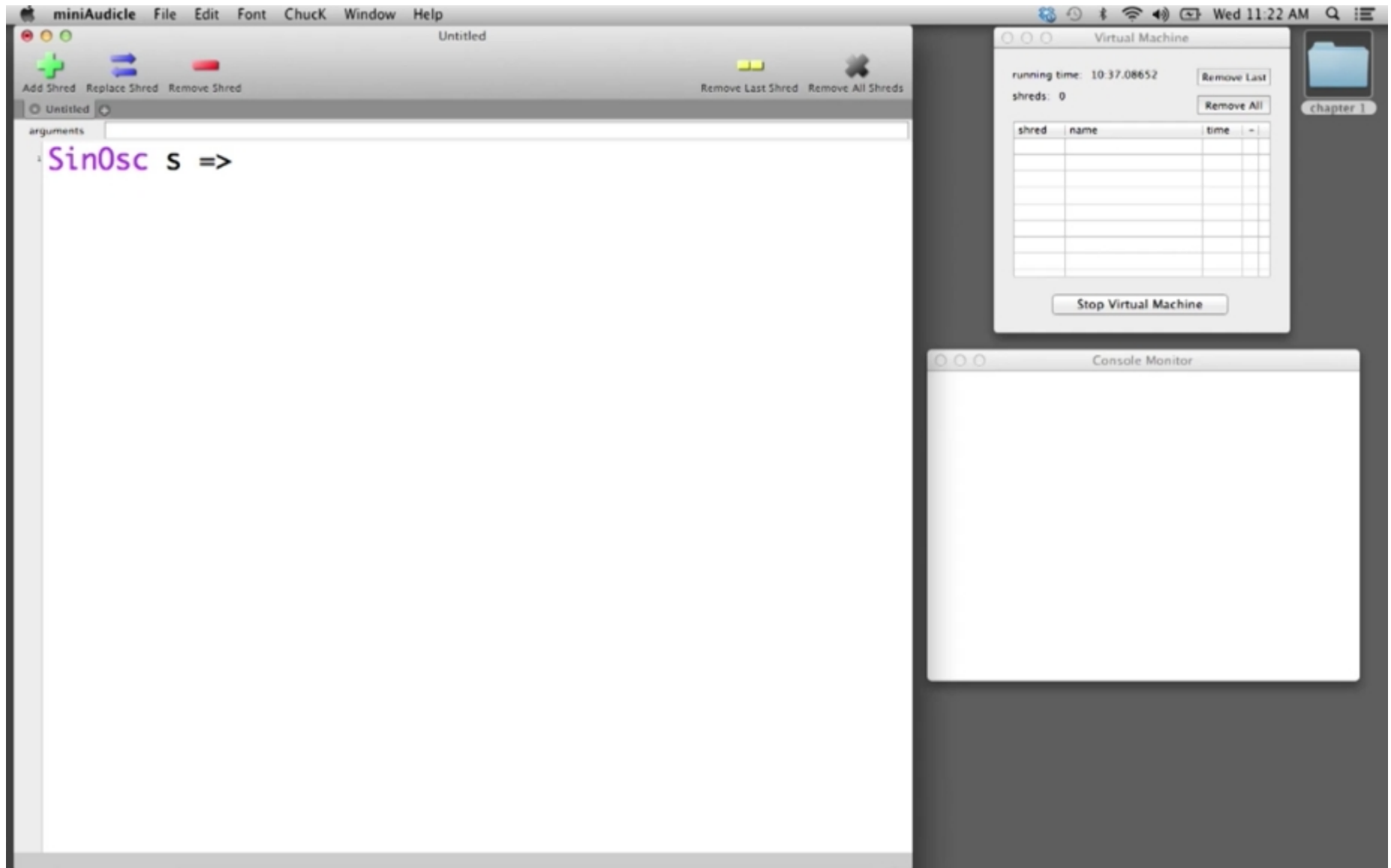
chuck.stanford.edu

OSX / Windows / Linux

MiniAudicle

- Text editor
- Virtual machine monitor
- Console Monitor

# MiniAudicle (Windows & Mac)

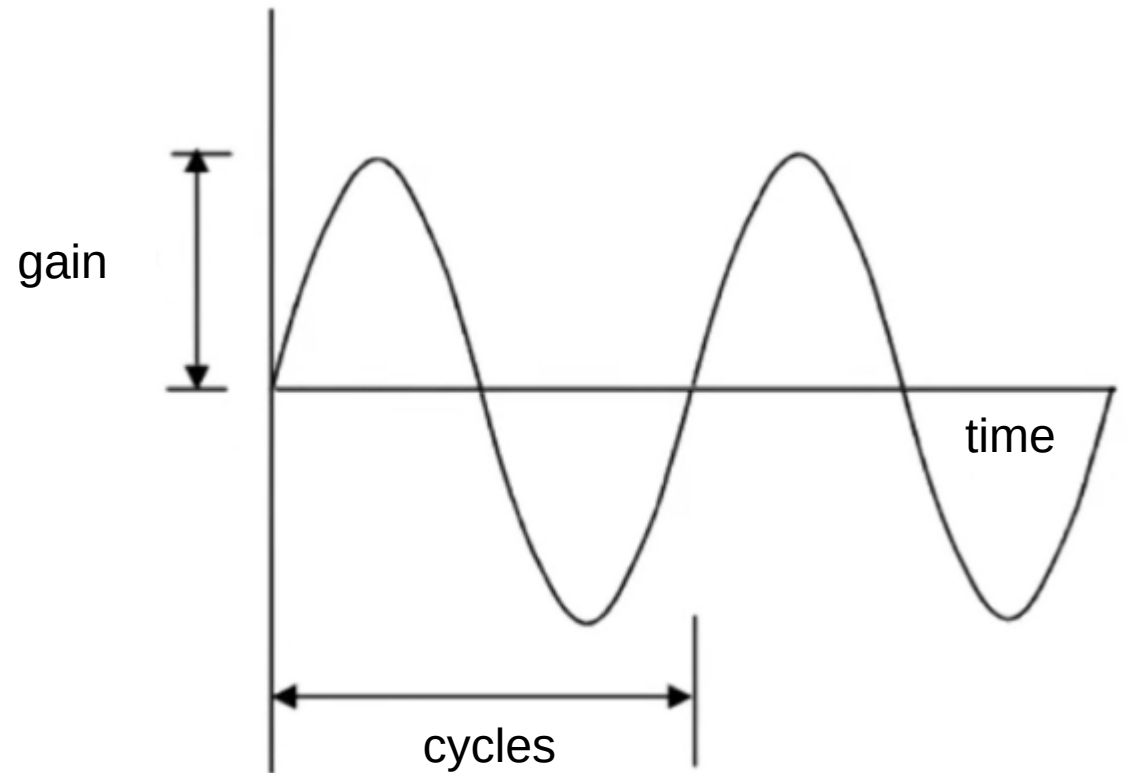


# Hello Sine

Print to console

Hello Sine!

SinOsc



Digital Audio Converter => dac

=> some duration to now

# Hello Sine

## Waveforms

SinOsc

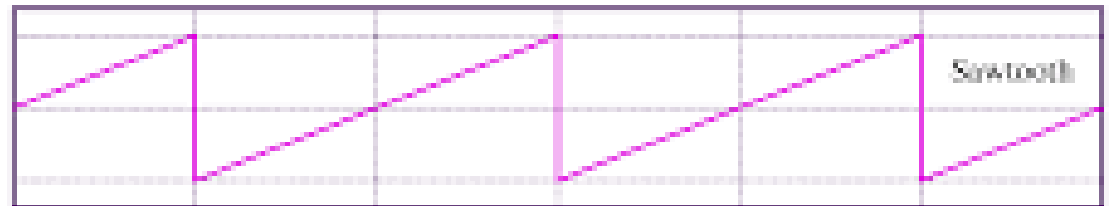
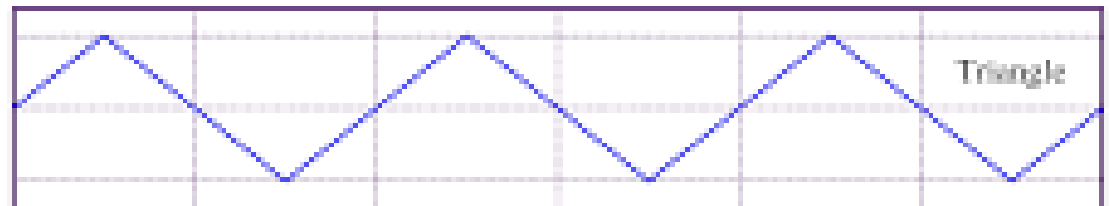
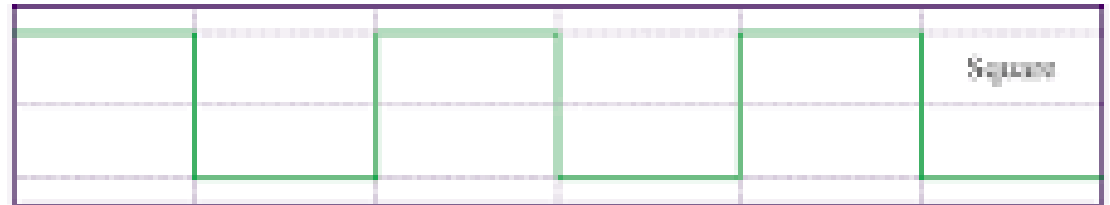
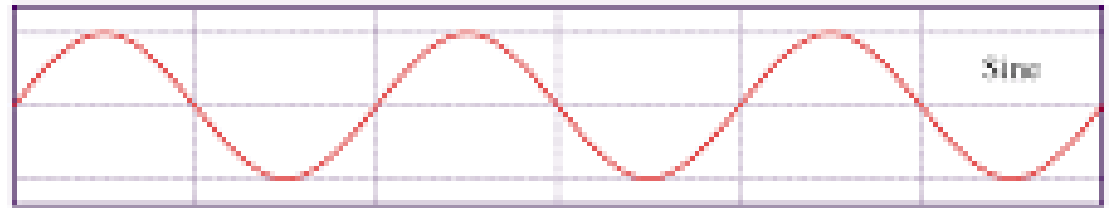
SqrOsc

TriOsc

SawOsc

`/*Comments*/`

or `//`





# Data Types and Variables

Print integers `int` and floating points `float`

Shortcuts

Importance of variables

Data Type	Description	Example	Comment
<code>int</code>	Integer	3, 3541	No Decimal
<code>float</code>	Floating Point	2.23, 22.1412	Decimal
<code>string</code>	String of Characters	"hello", "data/ sound.wav"	List of Characters
<code>dur</code>	ChuckKian Duration	1::second, 20::ms	Duration
<code>time</code>	ChuckKian Time		Time in Samples

# Time in Chuck

**time** and **dur** are native types

time: a point in time

dur: a length of time

default durations

name	actual duration
samp	length of 1 digital sample in Chuck
ms	1 millisecond
second	1 second
minute	1 minute
hour	1 hour
day	1 day
week	1 week

Only by manipulating **now** => advance time

# Time in Chuck

Special properties of **now**

when read gives us the current chuck time

when modified: moves time along in Chuck

Chuckling a duration to **now** advances time while automatically suspending your code and letting sound generate

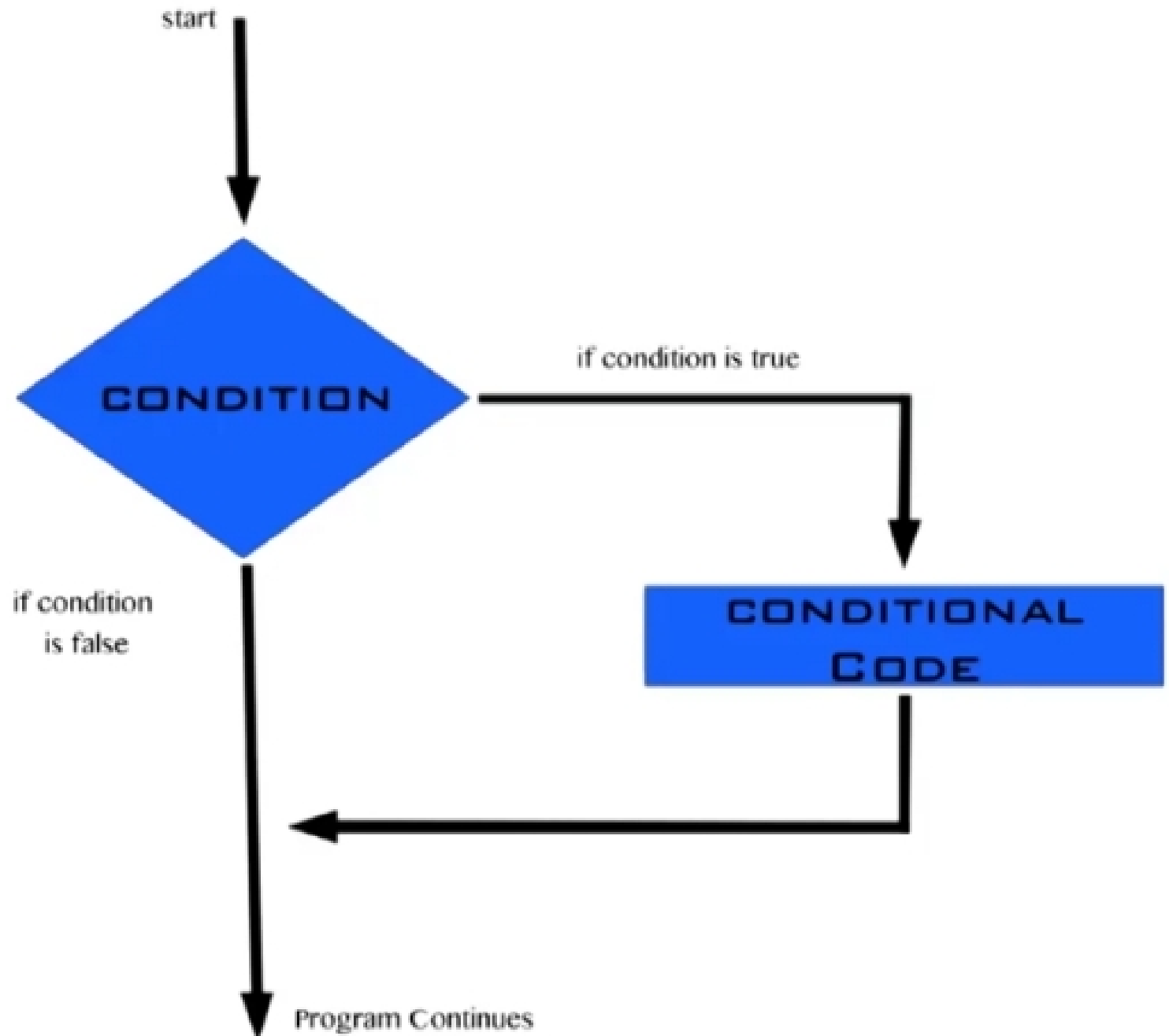
Until you advance time, you are working at a single point in time

# Time in Chuck

Alarm example

# Control Structures

If statement

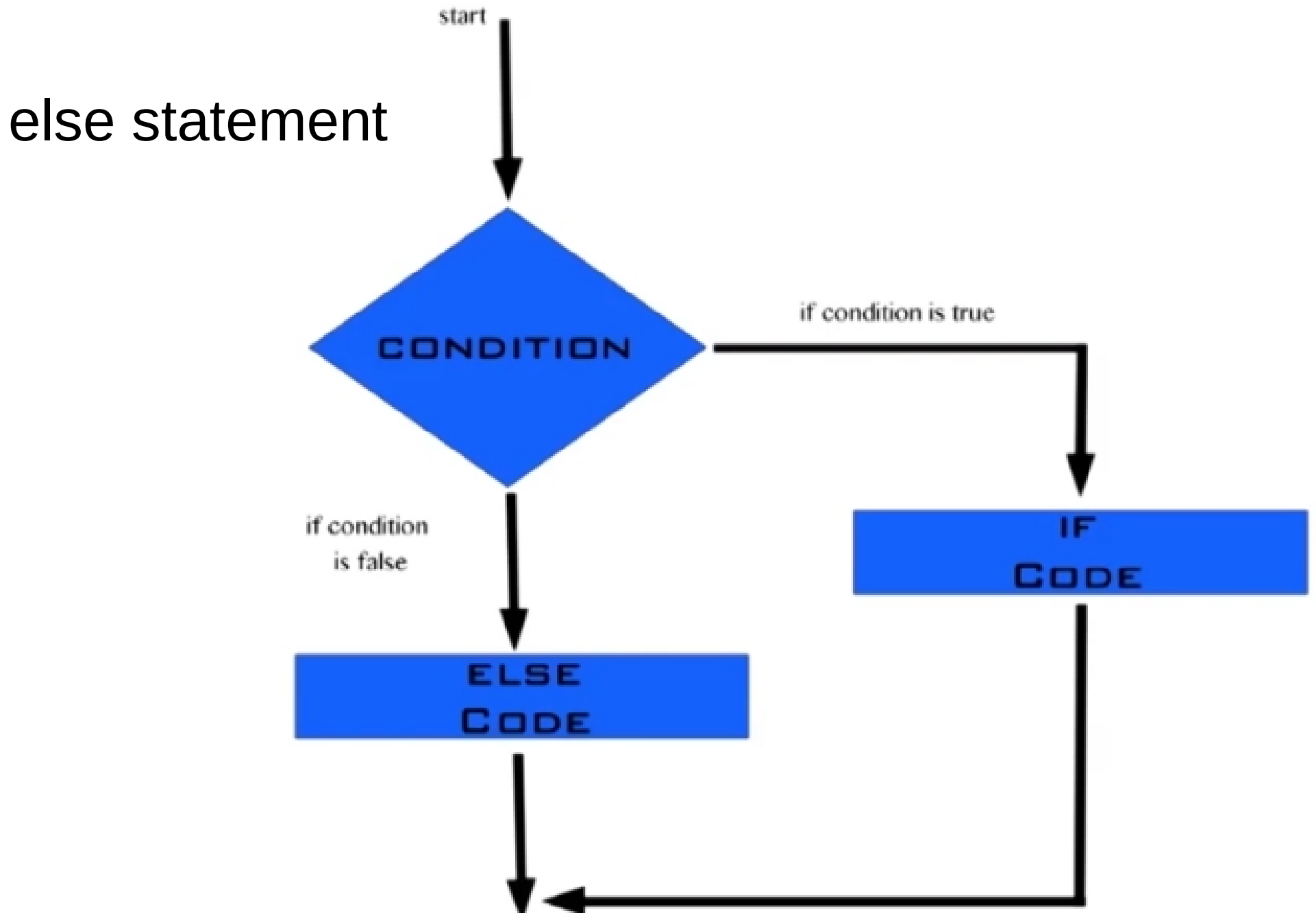


operators

`==` , `&&` , `||`

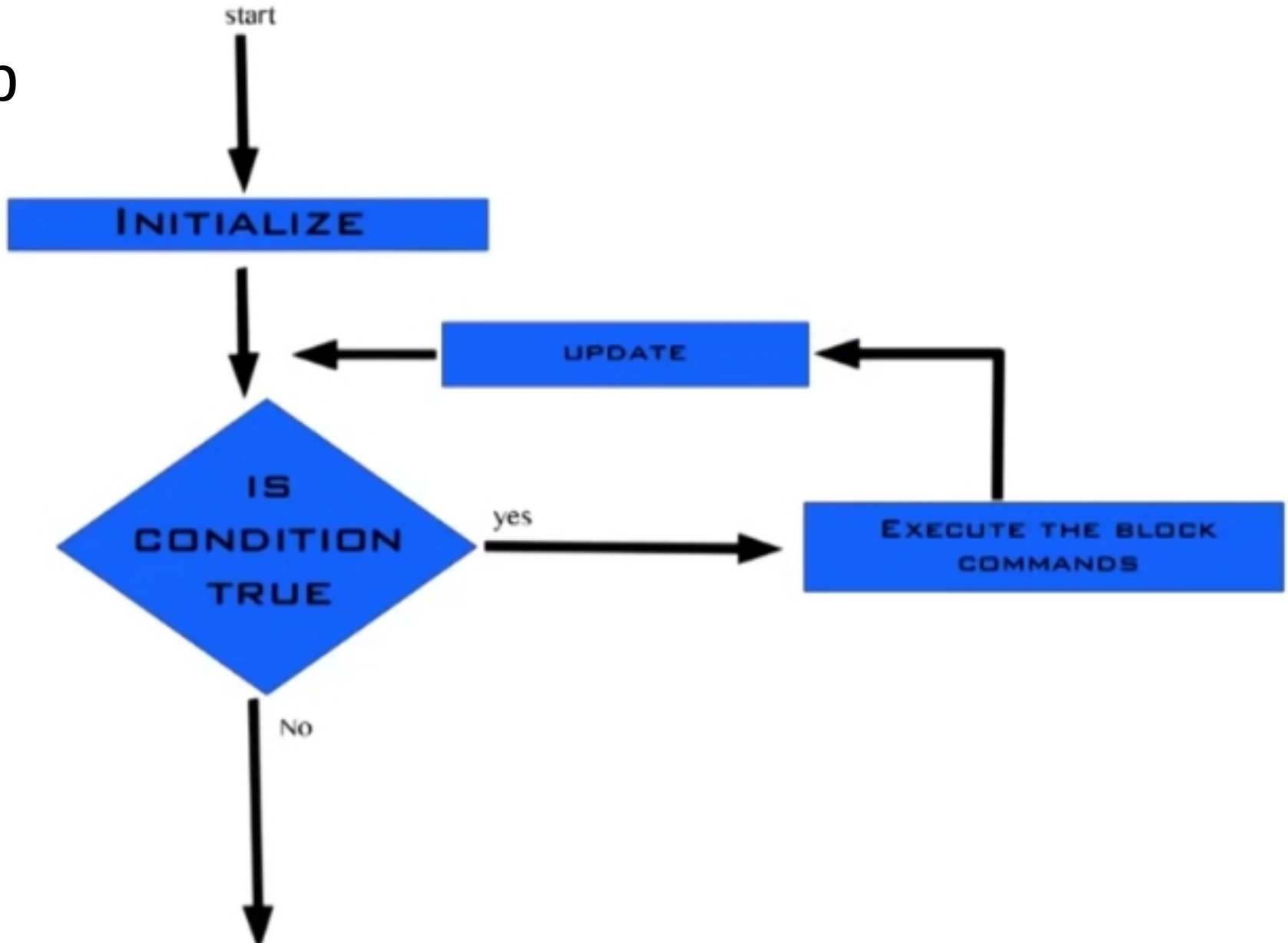
`!=` , `<` , `>=`

# Control Structures



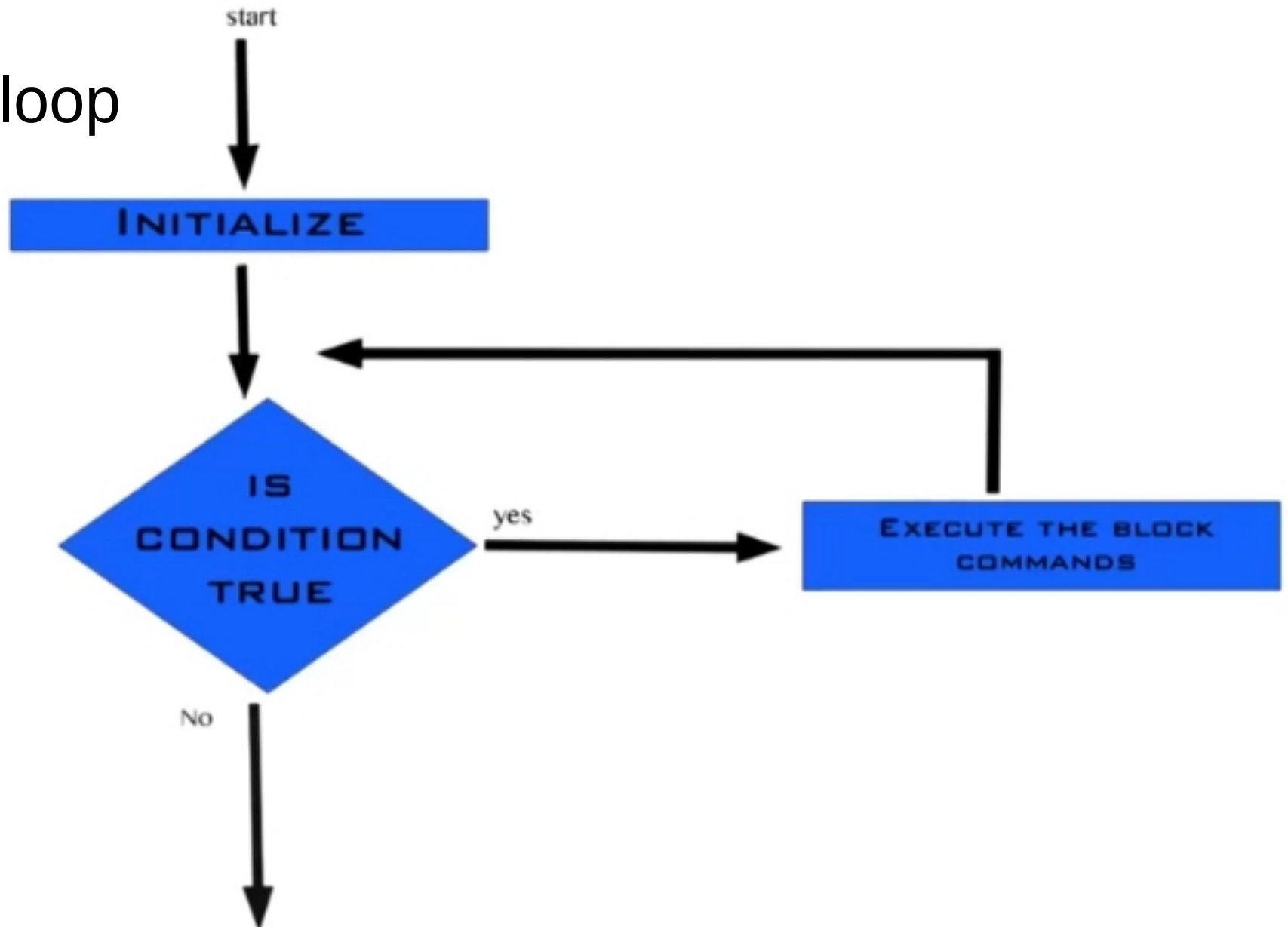
# Control Structures

for loop



# Control Structures

while loop





# Next Class

Homework => install chuck

vitogr@impa.br

Session 2: Chuck Libraries and Arrays