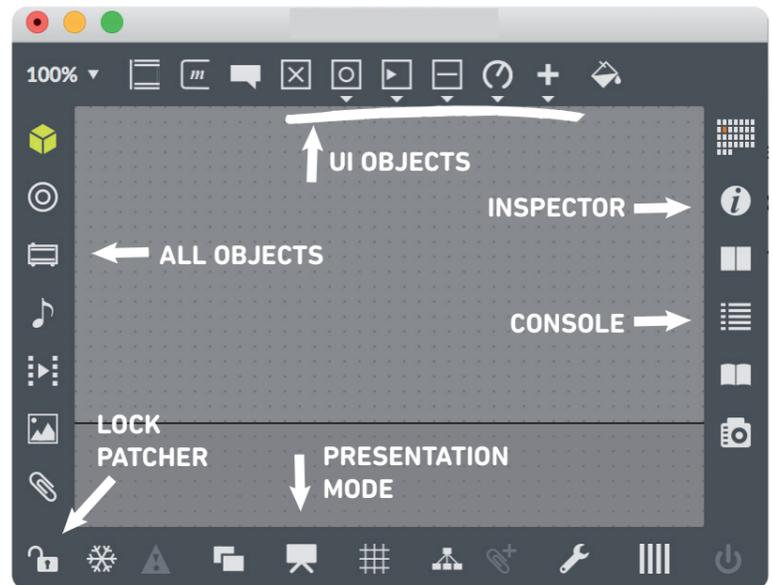


# MAX CHEATSHEET 1

## KEYBOARD SHORTCUTS!

- CMD + CLICK** ANYWHERE IN PATCHERWINDOW TO LOCK IT
- CMD + CLICK** ON UI OBJECT (e.g. SLIDER) TO EDIT ITS VALUE IN AN UNLOCKED PATCH
- HELP** RIGHT CLICK ON AN OBJECT > **HELP**
- n** CREATE A **NEW OBJECT**
- b** CREATE A **BANG** (= bang)
- m** CREATE A **MESSAGEBOX** (can be used as a debugger / monitor)
- i / f** CREATE A **NUMBOX** OR A **FLONUMBOX** (= 1 / 1.)
- t** CREATE A **TOGGLE** (= 1 / 0)

## PATCHER WINDOW



## AN OBJECT'S ANATOMY **n**

object

- EVERY OBJECT HAS A **PARTICULAR FUNCTION**
- EVERY OBJECT HAS **INLETS AND OUTLETS**
- THE **LEFTMOST** INLET IS HOT – IT TRIGGERS THE OBJECT'S FUNCTION (AND THEREFORE OUTPUT)
- **ALL OTHER INLETS** ARE COLD – THEY'RE USED TO CHANGE ARGUMENT (THIS FUNCTION'S "SETTINGS")

· ARGUMENTS CAN BE SET WHEN CREATING THE OBJECT → **random 5**

· ARGUMENTS CAN BE OVERWRITTEN **10**

**random 5** (BUT MIND: IT WON'T CHANGE IN THE OBJECT'S NAME!)

## MESSAGE BOXES **m**

OUTPUT THE MESSAGE (AND REPLACE ARGUMENTS)

SET THE MESSAGE WITH NO OUTPUT (ALSO GOOD FOR MONITORING!)

1 2 3 4

- A MESSAGE BOX IS AN OBJECT, TOO!
- IT CAN BE USED TO:
  - > **DISPLAY THINGS** (= E.G. THE OUTPUT OF OTHER OBJECTS)
  - > **SEND MESSAGES** TO OTHER OBJECTS
  - > **FORMAT STRINGS AND COMMANDS**
- A MESSAGE BOX CAN CONTAIN ANY DATA TYPE!
- **ARGUMENTS CAN BE REPLACED** IN MESSAGES

1 2  
i'm benni

hello \$1 \$2

hello i'm benni

## "DATA TYPES"

- INTEGERS 22 0 1
- FLOATS 22.2451 1.1 999.123457
- LISTS 1 2 3 4 hello stupid 1.1 211 hello
- BANG bang
- SYMBOLS "1 2 3 4" "bier wut" "1.1 hallo"
- SIGNALS  signal

### MOST OBJECT "EXPECT" CERTAIN DATA TYPES (AND REACT ACCORDINGLY)

hello i'm benni

**A** SENDING A NON-NUMBER TO A [+ ] OBJECTS PRINTS AN ERROR INTO THE CONSOLE

+ 1

**B** SENDING A NUMBER TO A [+ ] OBJECTS OUTPUTS THE RESULT

1  
+ 1

1.2  
+ 1.

**C** IF YOU WANT THE OBJECT TO WORK WITH FLOATS, IT IS NECESSARY TO PRE-DEFINE IT WITH A FLOAT

**!** SENDING A FLOAT TO AN OBJECT DEFINED TO HANDLE INTEGERS WILL USUALLY TRUNCATE THE OUTPUT

2.24 5  
unpack i i  
2 5

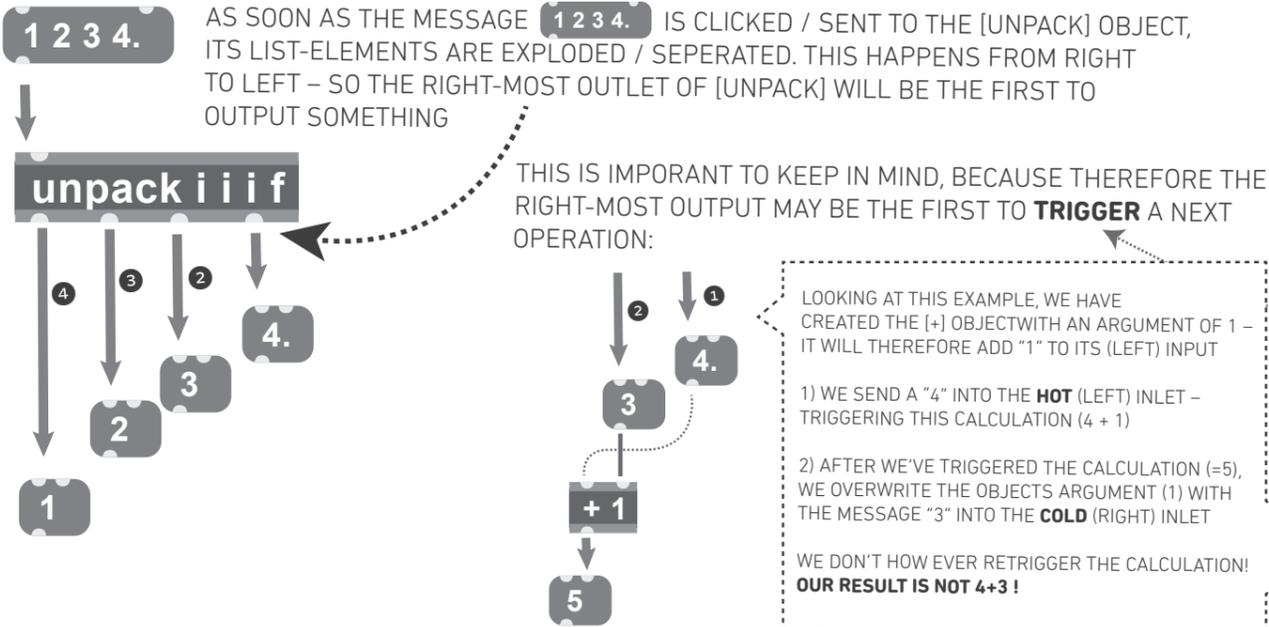
# MAX CHEATSHEET 2

## ORDER OF MESSAGES

**THIS IS CRUCIAL!**

BE AWARE, THAT MESSAGES ARE ALWAYS ORDERED:

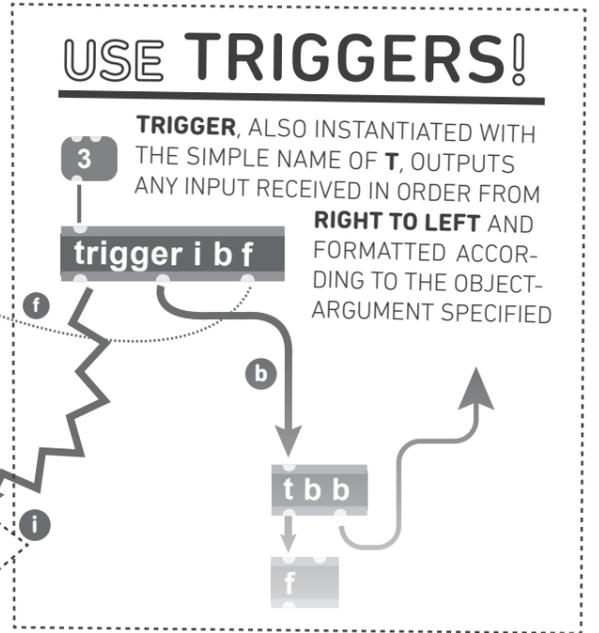
**RIGHT TO LEFT**



## USE TRIGGERS!

**TRIGGER**, ALSO INSTANTIATED WITH THE SIMPLE NAME OF **T**, OUTPUTS ANY INPUT RECEIVED IN ORDER FROM

**RIGHT TO LEFT** AND FORMATTED ACCORDING TO THE OBJECT-ARGUMENT SPECIFIED



SUMMING IT UP:

## CREATING AND SETTING UP OBJECTS

THE NAME WE GIVE OBJECTS DEFINES "WHAT THEY ARE"

THINK: DELAY PEDAL – WE HOOK IT UP TO DELAY A GUITAR SIGNAL

THE ARGUMENTS WE GIVE OBJECTS DEFINE "HOW THEY BEHAVE"

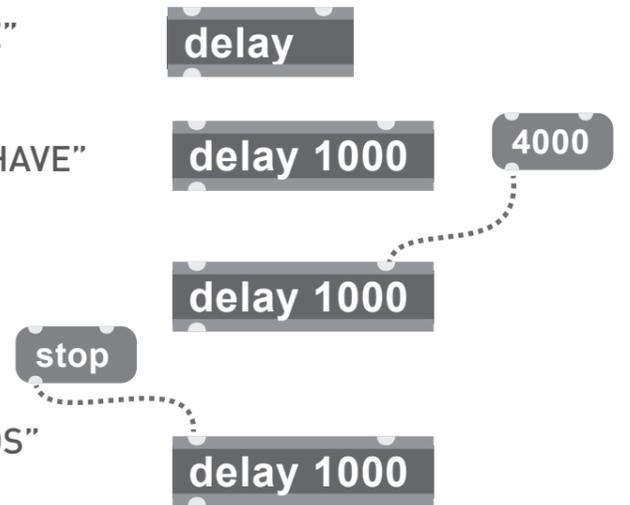
THINK: YOU SET THE DELAY TIME ON THE PEDAL BEFORE YOU PLAY

ARGUMENTS CAN USUALLY BE CHANGED DYNAMICALLY, ALTERING AN OBJECT'S BEHAVIOUR

THINK: MAYBE YOU WANT MORE DELAY LATER IN THE SONG

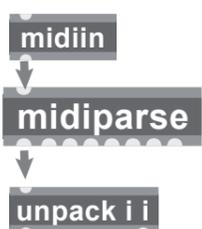
PARTICULAR MESSAGES ARE RESERVED AND MAY ACT AS "COMMANDS"

THINK: YOU WANT TO CLEAR THE FEEDBACK IMMEDIATELY WITHOUT CHANGING THE DELAY TIME OR THE PEDAL

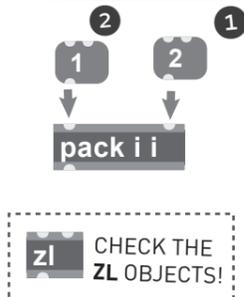


## SOME RANDOM REMINDERS

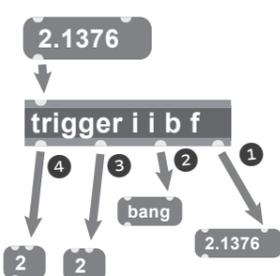
### UNPACK LISTS



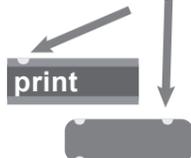
### UNPACK LISTS



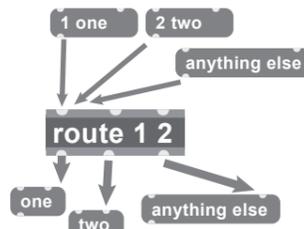
### ORDER MESSAGES



### DEBUGGING



### ROUTING



### MATH & LOGIC



### GATES & SWITCHES

