Orca workshop

based on the work of Devine Lu Linvega

What is Orca?

- An esoteric programming language
- Designed to control music making devices
- It has 26 commands (which are each 1 letter long)
- It runs on a grid
- Everything is visible - data and code

General info

- Bang - the action of triggering an output
- Count starts at 0, not 1
- Base 36 numbering - 0-9 then A-Z
- Notes are ABCDEFG. Sharp notes are lower case

Basic commands

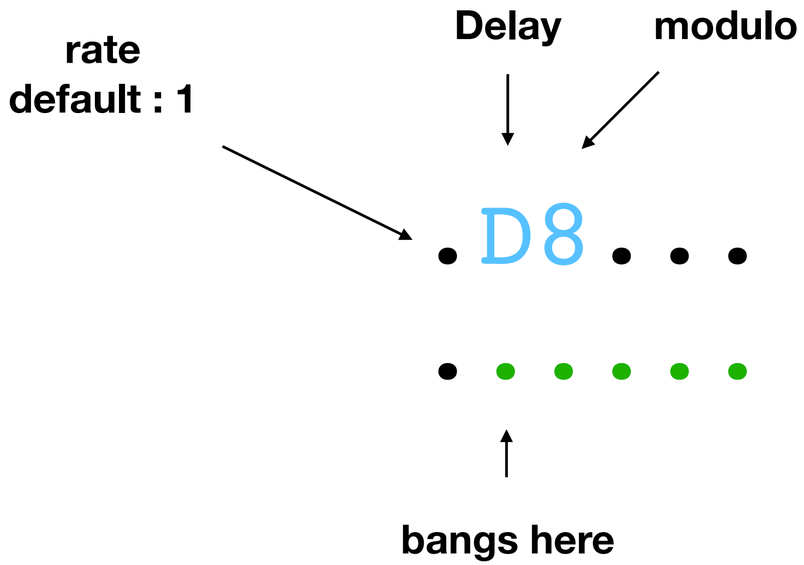
- Part 1 - Basics : D, R, T, C
- Part 2 - Logic : I, A, F
- Part 3 - Projectors : E, H, X, O
- Part 4 - Variables : V, K, J, Y

Basics

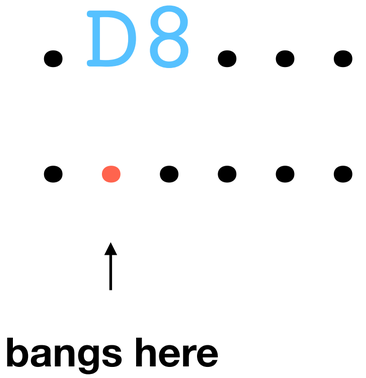
- The basics of playing a note and a sequence of notes
  - D - Delay
  - R - Random
  - T - Track
  - C - Clock

Delay

- "D8" bangs every 8th frame, triggering the note
- Rate of "8" would be at 1/8 speed (it is a divider)



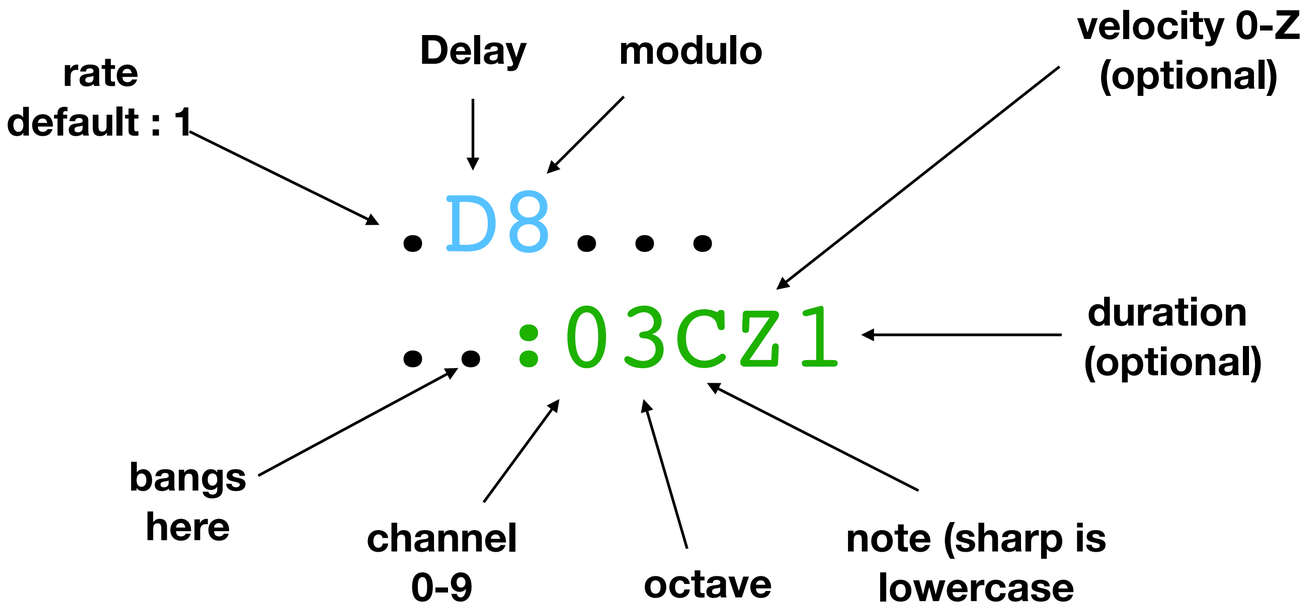
Bang - What it does



- A "bang" causes a triggering action
- Always occurs below the command

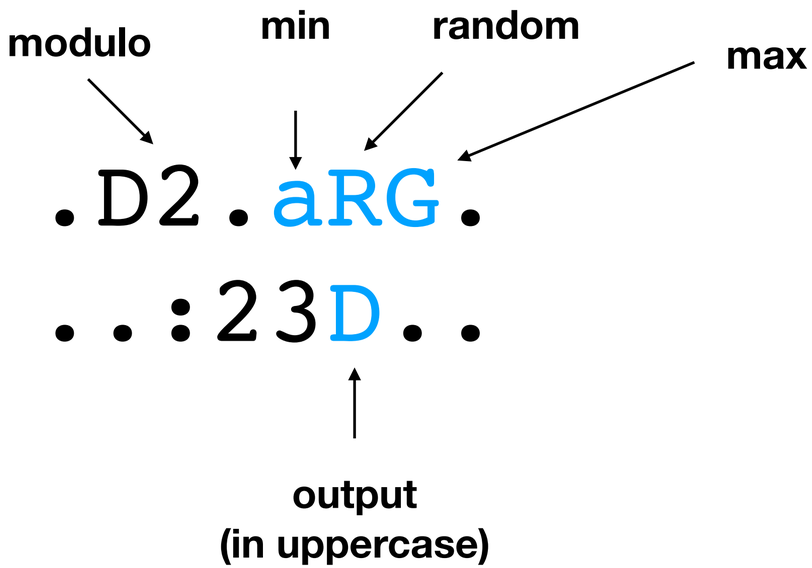
Send a MIDI note

- Note triggered by "bang" under the D
- ":03C" will send the C note on the 3rd octave
- MIDI command is ":" , parameters are channel, octave, note, velocity (opt)



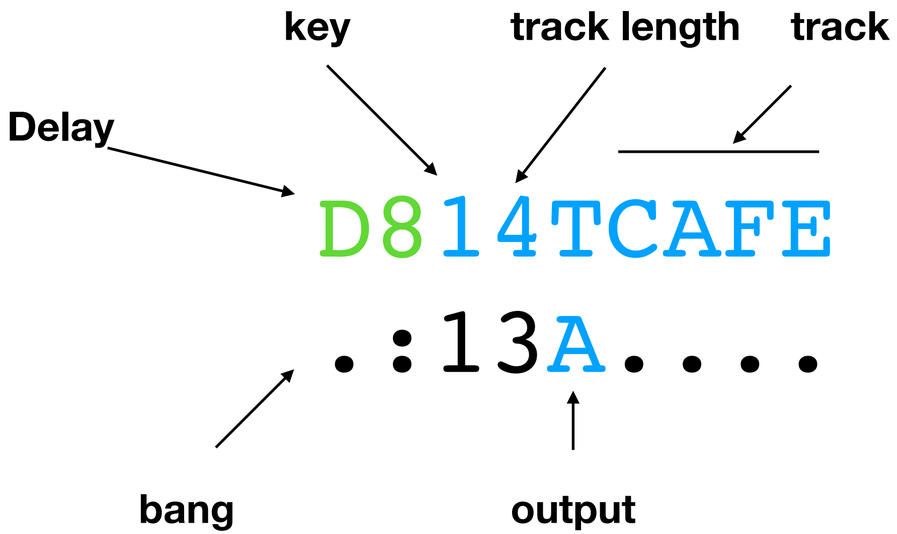
Play a random note

- "aRG" will output a random value between A and G
- The right side uppercase character indicates an uppercase output (if a note, d would be d sharp)



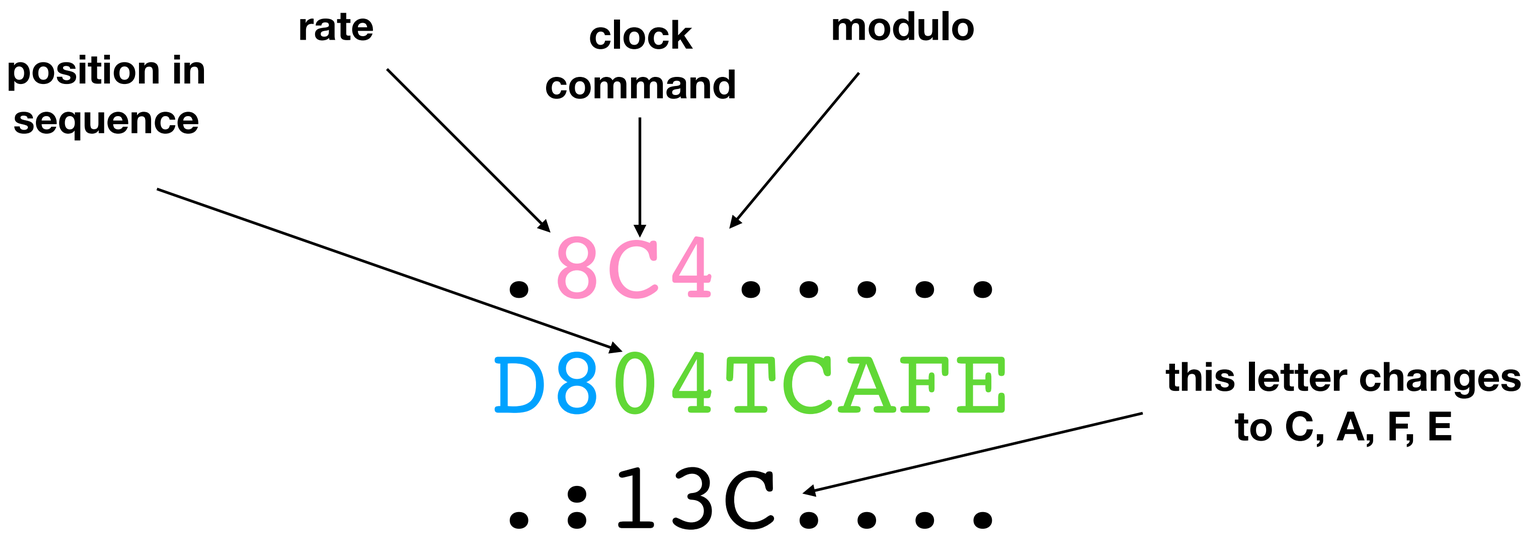
Make a melody

- "14TCAFE" creates a track of 4 notes, and outputs first value
- "D" command triggers a "bang" to ":", generating MIDI output



Play the melody

- "8C4" will count from 0 to 3, at 1/8 speed
- :03C will send the C note on the 3rd octave
- "C" outputs value from 0 to 3, changes position in track
- "T" outputs the 0th letter in the track to the position below the "T"

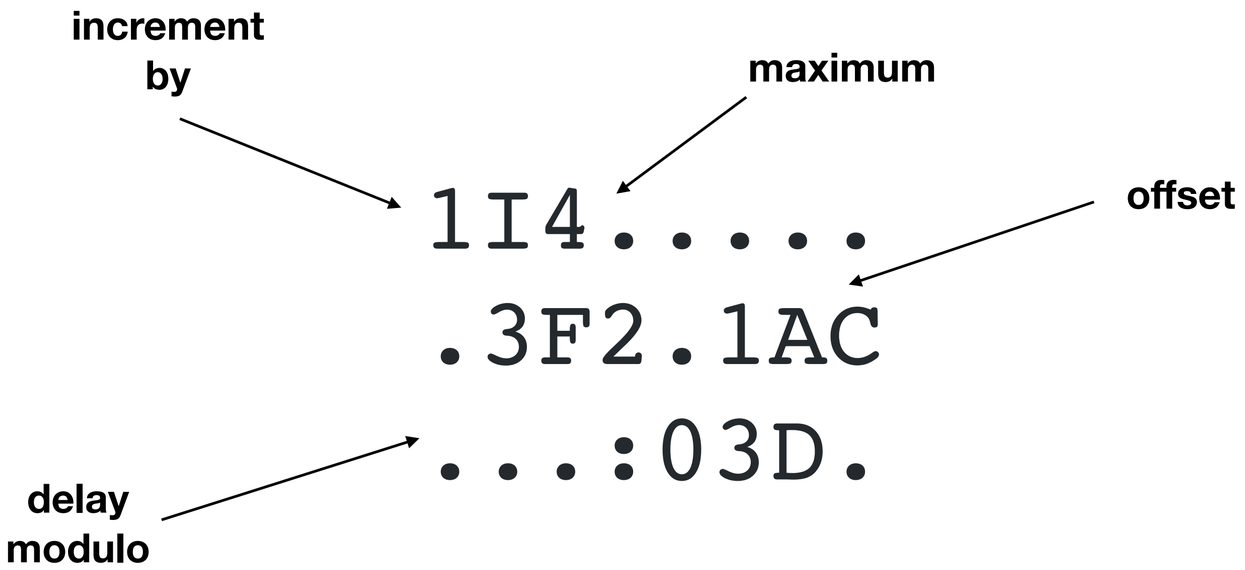


Logic

- Basics of automating logical decisions
- I - Increment
- A - Add
- F - If
- B - Subtract

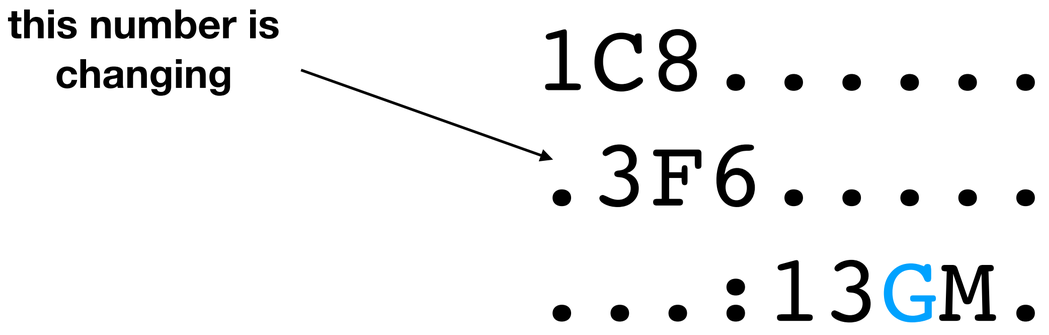
Play note at a specific interval

- "1I4" will increment to 4 at a rate of 1
- ".F2" will bang only if leftside input is equal to 2



Bang if 2 numbers match

- "C" will count from 0 to 7, then repeat
- "F" will compare the 2 inputs, bang if they match



Play a note with an offset

- "1AC" will add 1 to C and output D
- To get D#, use a lowercase d (like 1Ac)

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.D8.1AC.
..:03D..
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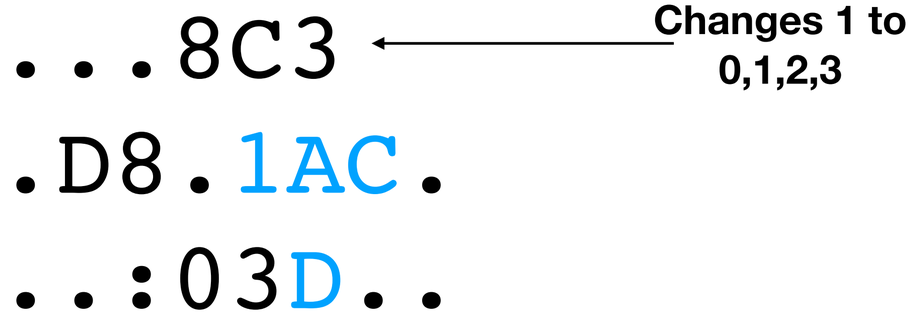
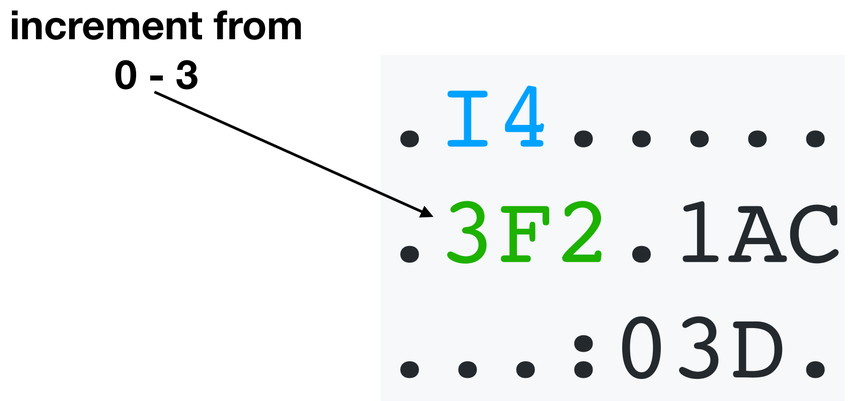
Play a changing note with an offset

- The C3 now changes the 1 (in bang position) to 0,1,2



Play a note at a specific interval

- ".I4" will increment to 4, at a rate of 1 (default)
- "F" will bang only if left side input is equal to 2

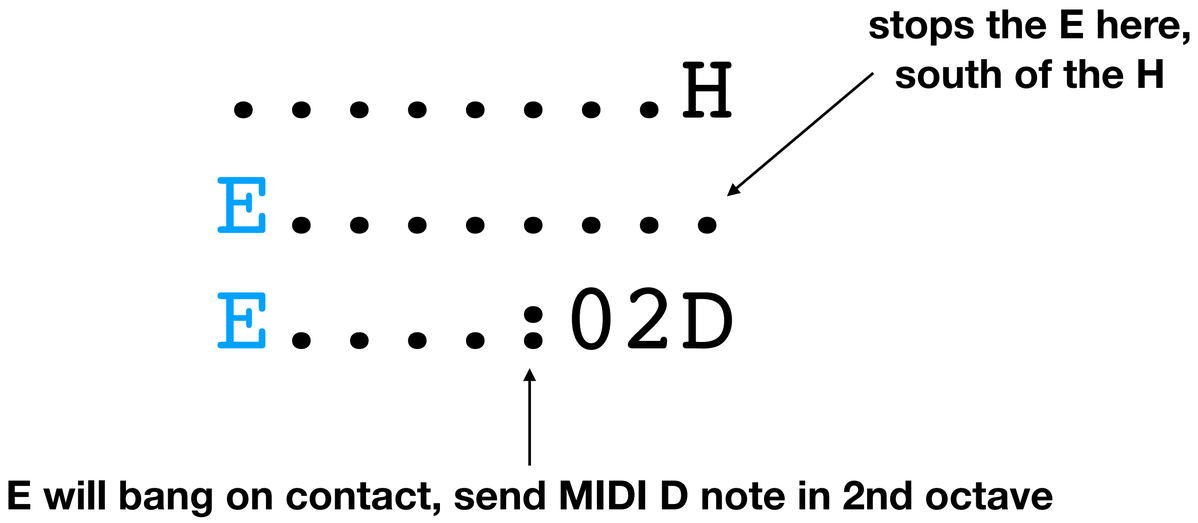


Projectors

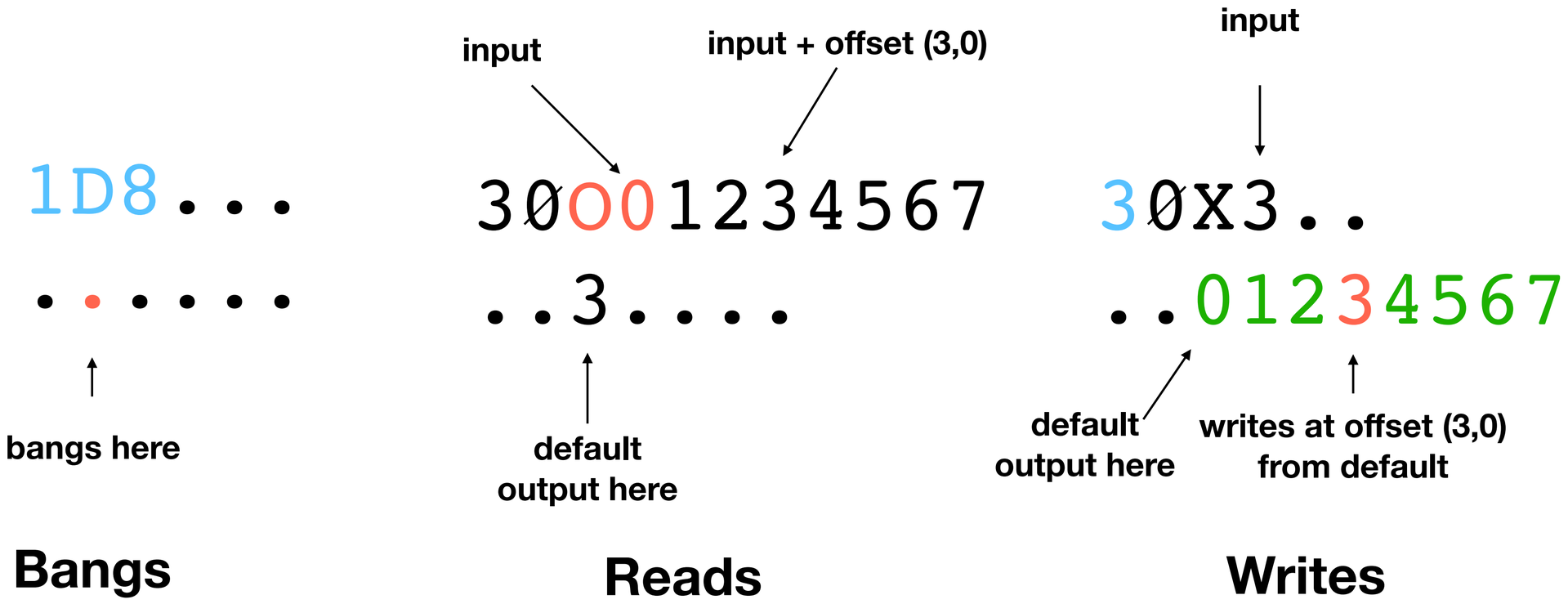
- Projectors are operators that create new operators
- E - East - travels eastward every frame (also N,S and W)
- H - Halt - Halt a moving operator
- X - Write - Writes value at offset
- O - Read - Reads value at offset

East and Halt

- E - will travel eastward, bang on contact
- Also N (north), S (south) and W (west) variations
- H - halts southward operand (when E is adjacent)

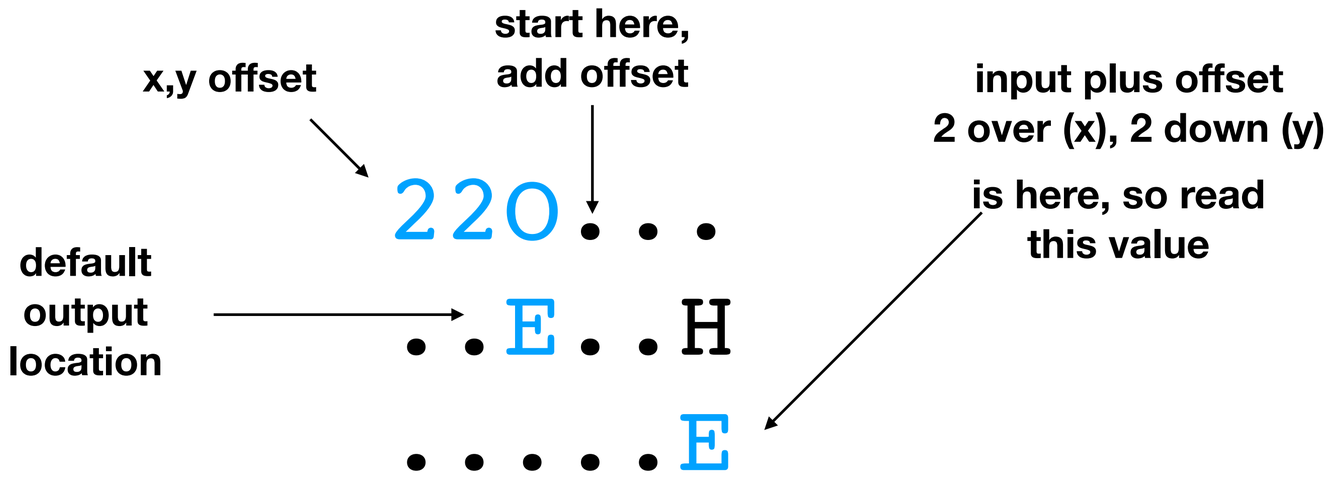


Bang/Read/Write conventions



Read a value at offset

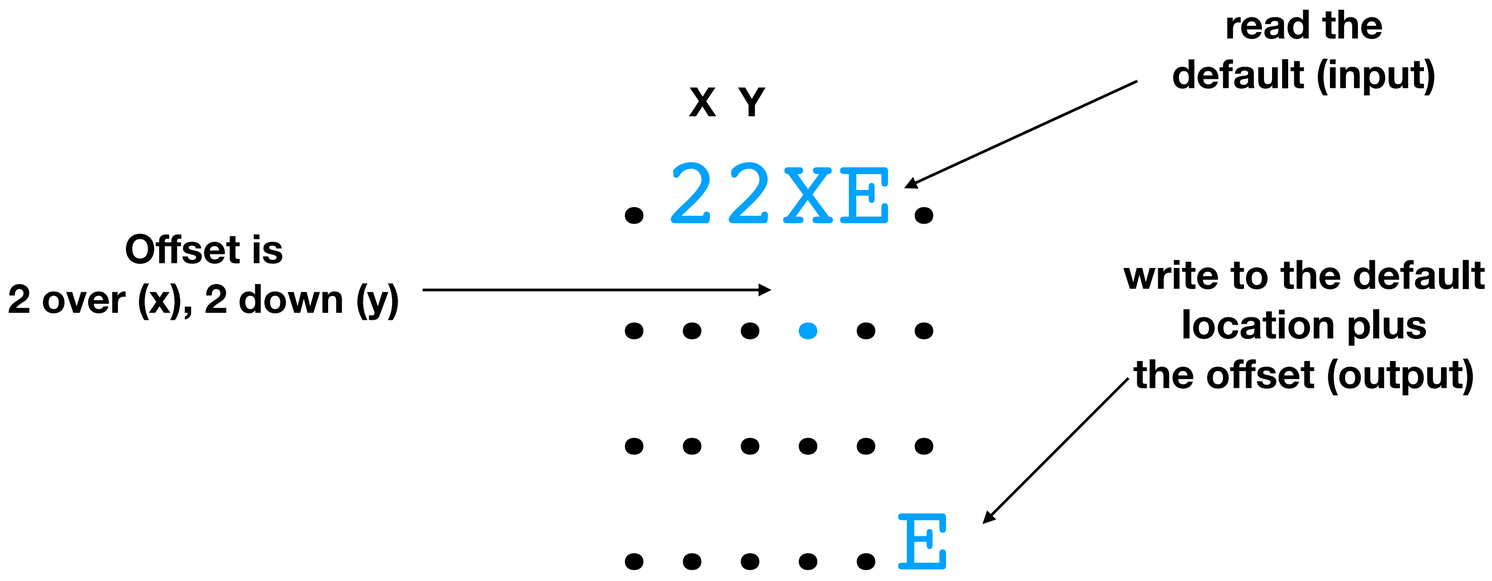
- Read data at input plus offset and store it at the output



Copy this grid into Orca and change the E (below the H) to a different letter (or number). What happens?

Write a value at offset

- Read data at input, write to the output plus the offset 2,2



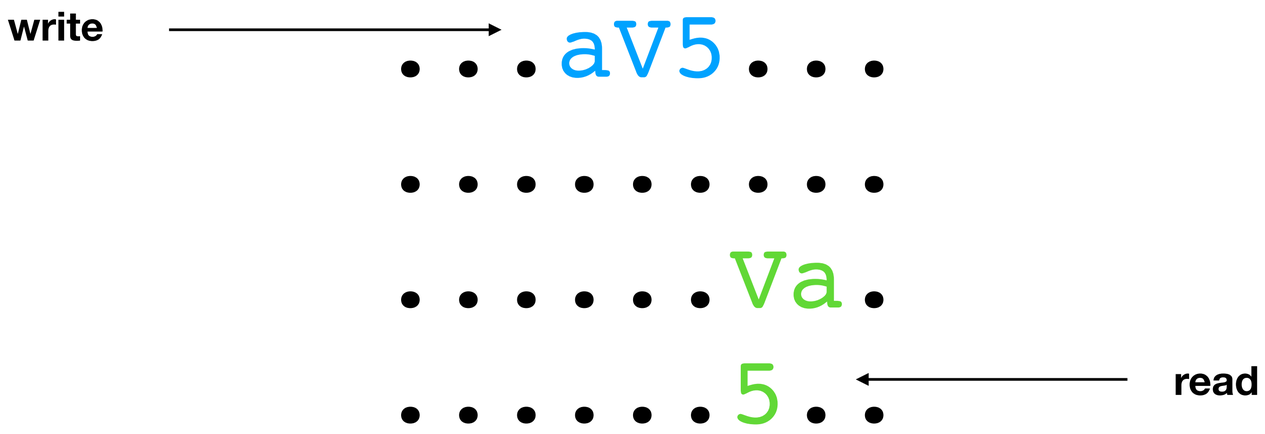
Copy this grid into Orca and change the E (next to the X) to a different letter (or number). What happens?

Variables

- Storing, accessing, combining data
  - V - Read or write a variable
  - K - Read multiple variables
  - Y - outputs west input, eastward
  - J - output the north input, southward

Read or write a variable

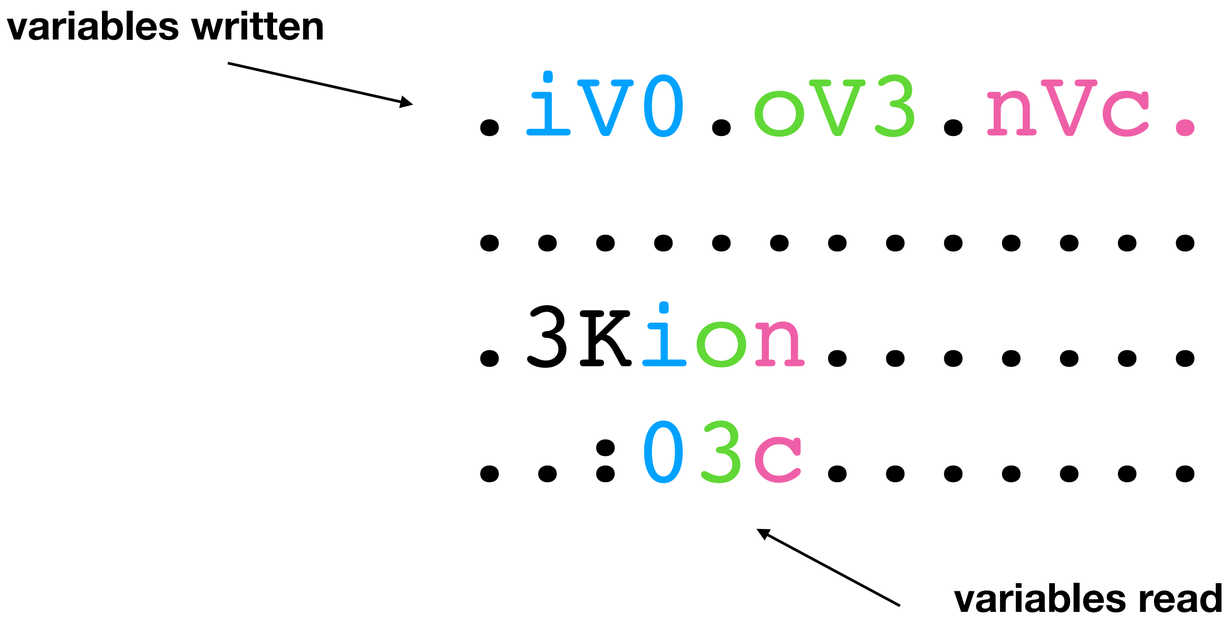
- aV5 - write the value of 5 to variable "a"
- Va - the value of "a" can be read



Notice the location of the input and output

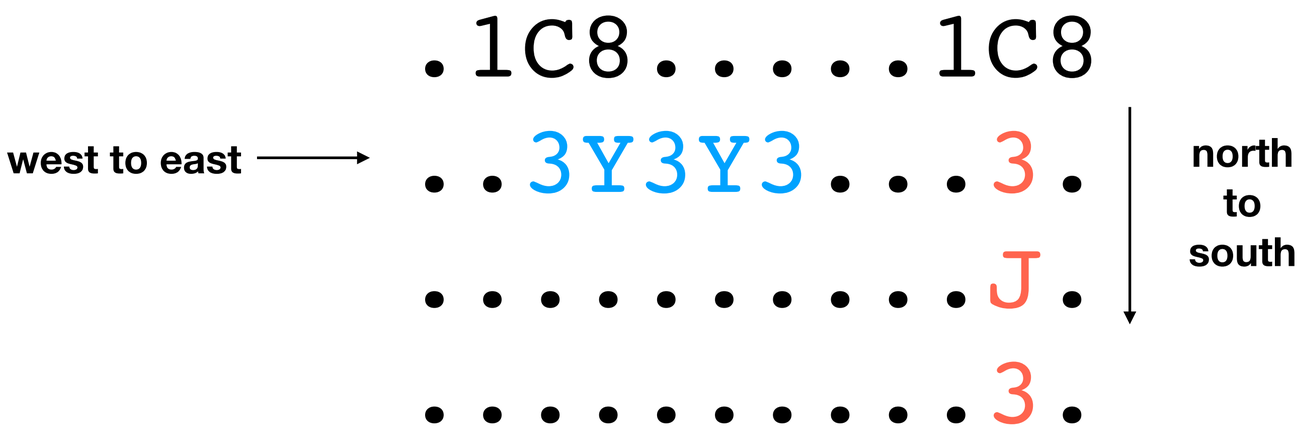
Read multiple variables

- "3Kion" outputs the contents of variables i, o and n
- This output used to construct the MIDI command



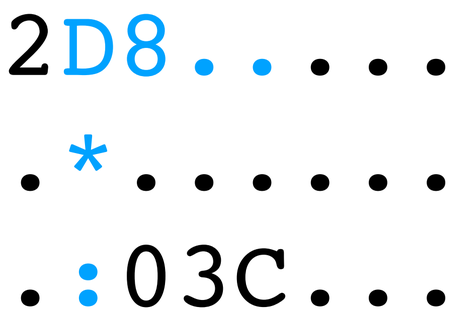
Carry value horizontally or vertically

- y - yumper - output the west input, eastward
- j - jumper - output the north input, southward



Carry a bang

- Transmit a bang into a tight spot



Questions?

- basics: Command definitions on the main Orca site
- benchmarks: Examples of categorized commands in context
- misc: Various examples of Orca coding technique
- setups: Examples of techniques for sending data
- tutorial: Interactive Orca tutorial using Orca code Instructions