# UNIT GENERATORS

Building blocks for sound synthesis

## Overview for the Week

- What's a Unit Generator?
- What are some unit generators in Nyquist?
- Unit Generator Implementation
- Functional Programming
- Wavetable Synthesis
- Scores in Nyquist
- Score Manipulation

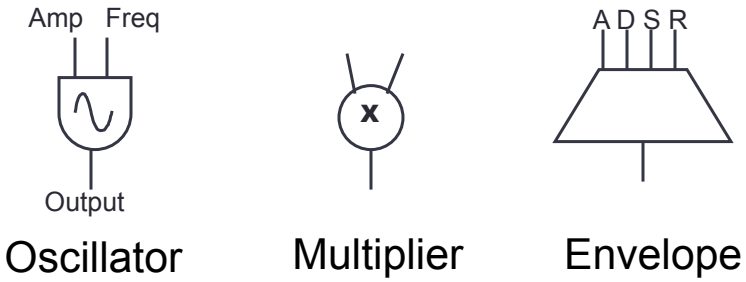
  

## What Is a Unit Generator?

- In the 50's Max Mathews conceived of sound synthesis by software using networks of modules: "Unit Generators"
- UGs are "primitives" in a sound synthesis system
- They perform sound generation and sound processing

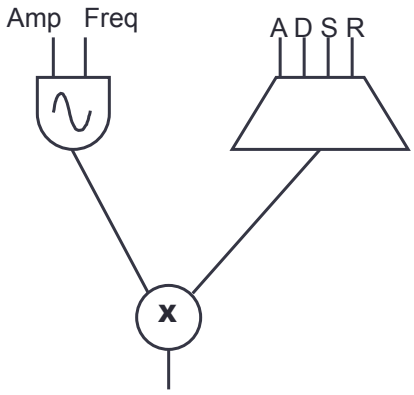
## Unit Generator examples




Oscillator Multiplier Envelope

# Combining Unit Generators

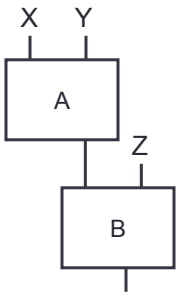







# Unit Generators in Nyquist

- Unit Generators are Functions on sounds




→ `B(A(X, Y), Z)`

## Some Basic Unit Generators

- `osc(c4)`
- `pwl(0.03, 1, 0.8, 1, 1)`
- `osc(c4) * pwl(0.03, 1, 0.8, 1, 1)`
- `osc(c4) * osc(g4)`

## Evaluation

- Normally, SAL expressions evaluate their parameters, then apply the function: f(a, b)
- What about sounds?
  - To avoid storing huge values in memory,
  - Nyquist uses *lazy evaluation*
  - Samples are computed only when they are needed
  - Nyquist *Sounds* contain either samples or the potential to deliver samples, or some combination