

# Math functions

MATH folder

# Single precision instructions

- Less precise but faster
- E.g. :
  - `sqrt->sqrtf`
  - `pow->powf`
  - ...

# Intrinsic functions

- Examples
  - `sqrt` -> `_dsqrt_rn`
  - `powf` -> `_powf` (344 implementation lines vs 17)
- Less precise but faster (1 order of magnitude both !)

# Atomic functions

## Avoiding *data race*

- atomicInc
- atomicAdd, Sub, Min, Max, Exch, And, Or, Xor, Dec
- atomicCAS (compare-and-swap) : used for generating all and your own atomic functions

# Cost of atomic

- If every wrap thread must do an atomic : all must retry before succeeding

# Single vs Double precision

- Example program : floating-point-perf
- Copy time should be halved

# Compiler options

- `—prec-sqrt=[true,false]`
- `—prec-div=[true,false]`
- `—use_fast_math` : all functions replaced by intrinsic
- `fmad` true by default