Phase 1

Saturday, 1 March 2025 11:27 PM

Phase I (adding & implementation for Existing Pkgs & Standalone Pkgs

* Existing Pkgs.

1. besselyn
2. betainc
3. betaincinv
4. Ellipj
5. gammainc
6. gammaincinv
7. heaviside
8. heavisidef
9. Kernel-betainc
10. Maxabsn
11. Maxn
12. Minabsn
13. Minmax
14. Minmaxabs
15. Minmaxabsn
16. Minmaxn
17. Minn
18. Polygamma
19. Rising-factorial
20. Roundsd

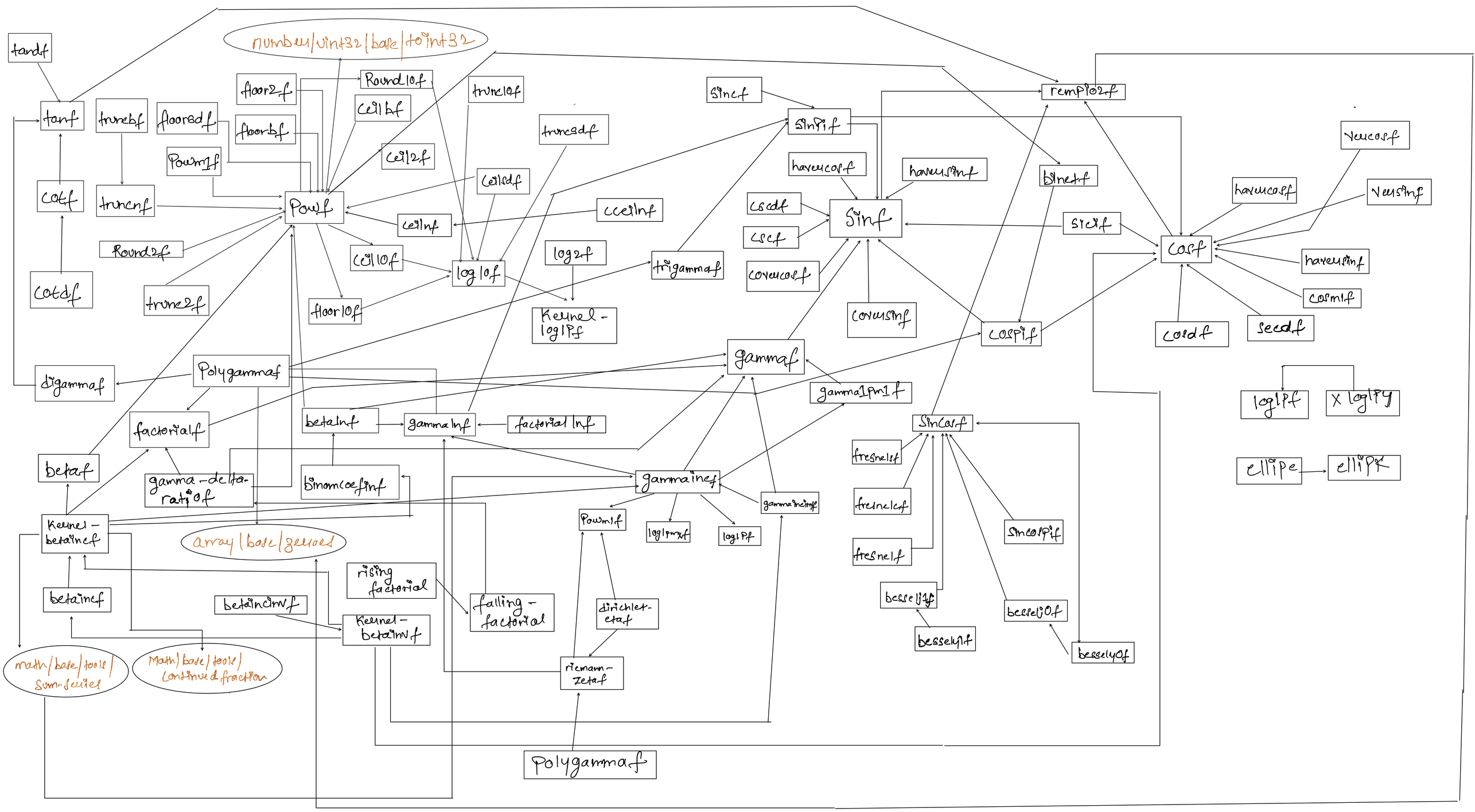
* Standalone Pkgs. (Pkgs with NO dependency)

Topologically Sorted.

- tribonaccif
- minnf
- minmaxnf
- maxnf
- lucasf
- log1pf
- labsf
- Kernel-tanf
- Kernel-sinf
- Kernel-cosf
- gamma-lanczos-sumf
- gamma-lanczos-sum-exp-scaledf
- fibonaccif
- factorial2f
- expm1f
- wmapf
- minmaxabsnf
- minabsnf
- minabsf
- minabsnf

Dependency Tree
Saturday, 1 March 2025 3:06 PM

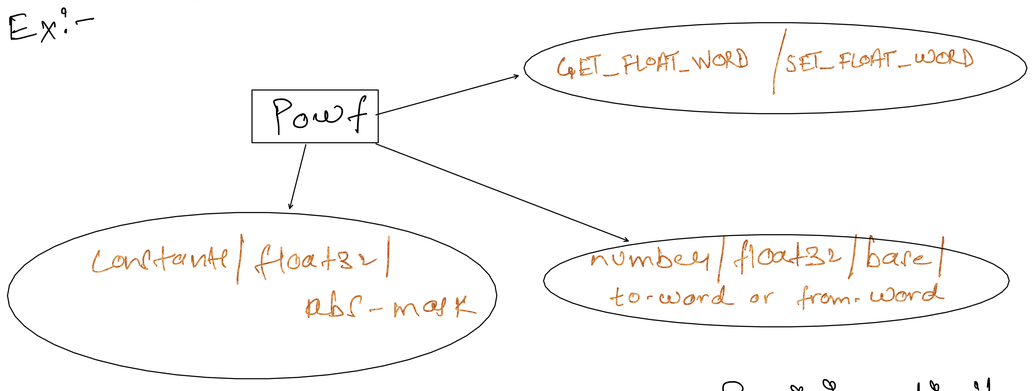
Phase II (Single-Precision Pkgs) Reference Implementation :- Existing float64 Pkgs.



* Challenges

- While working on single-precision Pkgs we'll have to check whether the corresponding modules exist for float32 if Not will have to implement them first before working on the pkg itself.

  Ex:-



- Ensuring the range of values lie in the Precision-limit of 32 bit int.
- Proper variable names being used for precise hexa-decimal values & representing hexadecimals to binary format.
- Having Pre-requiste knowledge of binary format of floats2 & these values inorder to use them explicitly in a Pkg.

  Ex:-

  FLOAT32_ABS_MASK === 0x7fffffff → Hexadecimal

Sunday, 2 March 2025 11:13 AM

Phase III (Developing implementations for non-Existing Pkgs:- float64 & float32)

Refrence Implementation:- SciPy, Julia, amos & etc.

* Airy functions.

i) airy(z,out) → airy func^n & derivatives.

ii) airye(z,out) → Exponentially scaled airy func^n.

iii) itairy(x,out) → Integrals of airy func^n.

* Elliptic functions & Integrals.

i) ellipkm1(p,out) → Complete elliptic Integral of the first kind around m=1.

ii) ellipkinc(phi,m,out) → Incomplete Integral of the first kind.

iii) ellipeinc(phi,m,out) → Incomplete elliptical integral of 2nd kind

* Bessel functions.

i) hankel1|2:- Hankel functions of the 1st & 2nd kind.

ii) hankel1|2e:- Exponentially scaled Hankel function of 1st & 2nd kind.

* Zeroes of Bessel function.

i) jn_zeroes(n,nt) → Compute Zeroes of integer order Bessel func Jn

ii) jnp_zeroes(n,nt) → Compute Zeroes of integer order Bessel func derivatives Jn.

* Integrals of Bessel func^n.

i) itj0y0:- Integrals of Bessel func^n of the first kind of order 0.

ii) itj2j0y0:- Integrals related to bessel func^n of the first kind of order 0

* Struve functions.

i) struve(v,x,out):- struve function

ii) modstruve(v,x,out):- modified struve function.

* Beta distribution

i) btdtria(p,b,x,out):- inverse of betainc w.r.t 'a'

ii) btdtrib(a,p,x,out):- inverse of betainc w.r.t 'b'

Part of in-house dependencies

* F distribution.

i) fdtr(dfn,dfd,x,out):- F cumulative distribution function.

ii) fdtridfd(dfn,p,x,out):- inverse to fdtr vs dfd

* Gamma distribution.

i) gdtr(a,b,x,out):- gamma cumulative distribution function.

ii) gdtria(p,b,x,out):- inverse of gdtr vs 'a'

iii) gdtrib(a,p,x,out):- inverse of gdtr vs 'b'