paths.R

* sPaths(s0, r, sigma, t, nSim, n)
* vPaths(v0, mu, sigma, gamma, t, lambda1, nSim, n)
* vasicekPath(r0, sig, kappa, r\_bar, t, nSim, days = 360)
* cirPath(r0, sig, kappa, r\_bar, t, nSim, days = 360)
* g2ppPath(x0, y0, r0, phi\_t, rho, a, b, sig, eta, t, nSim, days = 360)

# Project 1

randomNumber.R

* runif\_lmg(seed, n)
* rdisc(rn, val, p)
* rexp(rn, lambda)
* rnorm\_bmm(n)
* rnorm\_pmm(n)

# Project 4

bsm.R

* bsCall(s0,t,x,r,sigma)
* bsPut(s0,t,x,r,sigma)

bino.R

* binoCall(u, d, p, s0, x, rf, t, n)
* putBino(u, d, p, s0, x, rf, t, n, American)
* trinoCall(u, d, pU, pD, s0, x, rf, t, n, logPrice)

halton.R

* haltonSeq(num, base)
* call\_halton(s0, x, rf, sigma, t, n, b1, b2)

# Project 5

lsmc.R

* lsmc(paths, strike, r, t, nSim, n, func, k)
  + func = c("Laguerre", "Hermite", "Monomials")

fwdStart.R

* fwdPutEu(s0, r, sigma, t\_x, t\_n, nSim, n)
* fwdPutAm(s0, r, sigma, t\_x, t\_n, nSim, n, func, term)

# Project 6

Lookback.R

* fsLookback(s0, x, r, sigma, t, nSim, n, type)
* defaultOption(paths, lambda2, t, L0, r0, delta, alpha, epsilon)

# Project 7

finiteDiff.R

* efd(type, euro, s0, k, r, sig, t, dt, dsx, log)
* ifd(type, euro, s0, k, r, sig, t, dt, dsx, log)
* cnfd(type, euro, s0, k, r, sig, t, dt, dsx, log)

# Project 8

fixedIncome.R

# bonds

* zcBond(paths, fv)
* cpnBond(paths, pmtT, c, fv)
* zcBond\_cir(r0, sig, kappa, r\_bar, t, fv)

# options

* zcOption\_vasicek(paths, sig, kappa, r\_bar, exerT, t, k, fv, type)
* zcCall\_cir(r0, sig, kappa, r\_bar, exerT, t, k, fv)
* zcOption (paths, sig, kappa, r\_bar, exerT, t, k, fv, type, method, mSim)
* cpnOption(paths, sig, kappa, r\_bar, exerT, t, k, c, fv, type, method, mSim)
* zcOption\_gcpp(paths, x0, y0, r0, phi\_t, rho, a, b, sig, eta, exerT, t, k, fv, type, mSim)

# Project 9

abs.R

# used cirPath and zcBond\_cir

* findMBS(pv0=100000, r0=.078, r\_bar=.08, wac =.08, kappa=.6, sig=.12, years=30, nSim=30000)
* fitOAS <- function(x, r\_t, pv0=100000, wac =.08, expPv = 110000)
  + x is the OAS
  + r\_t is the r paths