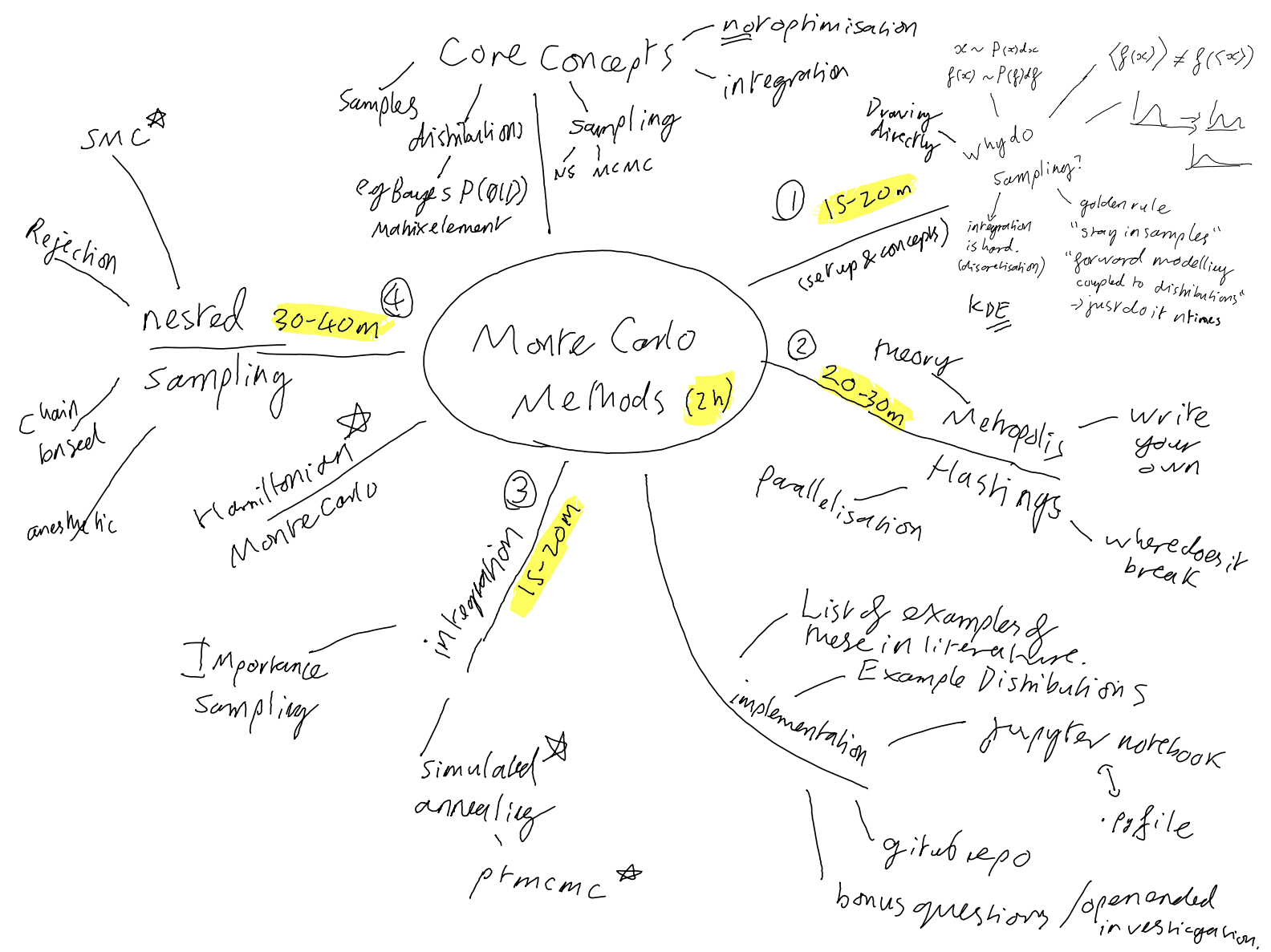
Monte Carlo Methods (2h)
Core Concepts
samples
distributions
eg Bayes P(θ|D)
marginalisation
integration
sampling
vs MCMC
① 15-20m
(setup & concepts)
$x \sim P(x)dx$
$f(x) \sim P(f)df$
Drawing directly
why do sampling?
$\langle f(x) \rangle \neq f(\langle x \rangle)$
integration is hard. (discretisation)
KDE
golden rule
"stay in samples"
"forward modelling coupled to distributions"
→ just do it ntimes
② 20-30m
theory
Metropolis Hastings
write your own
where does it break
parallelisation
③ 15-20m
integration
Importance sampling
Simulated annealing
ptmcmc
④ 30-40m
nested sampling
SMC
Rejection
chain based
analytic
Hamiltonian Monte Carlo
implementation
List of examples & more in literature.
Example Distributions
jupyter notebook
.py file
github repo
bonus questions / open ended investigation.