Handout 2 - code outline

- initialize grid and parameters
- calibrate : find Y_0 so $\phi(M) = \phi_{RP}$
- time loop : $t_n \rightarrow t_{n+1}$

  (2) $H_i^n \rightarrow H_i^{n+1}$

  (3) use H_i^{n+1} to get ϕ_i^{n+1}

Geometry

	x_1	x_{iM}	x_{iL}	
	= 0	= M	= L	
typical		1 cm	3 cm	
	x_1	x_{1001}	x_{3001}	$\rightarrow$ $dx = 10^{-3}$

(1) ~~convert~~ integrate once - ODE - RK4

calibration - bisection

(2) easy - Euler Method

$$H_i^{n+1} = H_i^n + dt \frac{A_M}{2FC_M} \exp(-\alpha_M \alpha \phi_i^n)$$

(3) hard - nonlinear BVP

options

i) linearize

ii) shooting method

iii) pseudotime iteration

iv) other iterative method

Handout 2 - code outline

- initialize grid and parameters
- calibrate: find Y_0 so $\Phi(M) = \Phi_{ap}$
- time loop: $t_n \to t_{n+1}$
  - (2) $H_i^n \to H_i^{n+1}$
  - (3) use H_i^{n+1} to get Φ_i^{n+1}

Geometry

$x_1 = 0$	$x_{iM} = M$	$x_{iL} = L$
typical	1 cm	3 cm
x_1	x_{1001}	x_{3001} ⇒ $dx = 10^{-3}$

(1) ~~constant~~ integrate once - ODE - RK4

calibration - bisection

(2) easy - Euler method

$$H_i^{n+1} = H_i^n + dt \frac{A_M}{zF_m} \exp(-\alpha_m \alpha \Phi_i^n)$$

(3) hard - nonlinear BVP

options

i) linearize

ii) shooting method

iii) pseudotime iteration

iv) other iterative method