

University College London

Numerical Analysis for Finance

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1. In the script abm.m which simulates an arithmetic Brownian motion, change the vector instructions that build the matrix X

```
% Compute the increments  
dX = mu*dt + sigma*sqrt(dt)*randn(nsteps,npaths);  
  
% Accumulate the increments  
X = [zeros(1,npaths); cumsum(dX)];
```

using

- (a) a for loop over the time steps;
- (b) a for loop over the paths;
- (c) two nested for loops, one over the steps, one over the paths, and viceversa.

Add the appropriate instructions to measure the CPU time spent in the loops.

2. Modify the script oup.m that simulates an Ornstein-Uhlenbeck process such that the matrix X contains the paths as rows rather than as columns. Do this everywhere throughout the code starting from where X appears first; do not just transpose X at the end.