

room 112, Res. I

TA: Arnav Subedi (online)

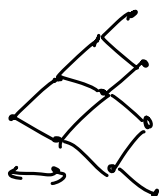
- Bring laptop to class
- partially interactive in-person class

Course topics:

- Introduction to git and scientific python
- Basics of financial math (interest, cash flows, bonds, options)

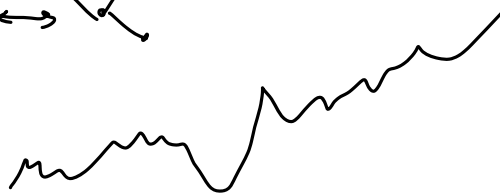
Intro

- Binomial tree models:



discrete

- Brownian motion:



cont.

- Stochastic integration, stochastic ODEs, Itô's lemma
- Black-Scholes eq.
- Time Series Analysis

Main guiding question: What is the fair price of an option contract?

At this moment, an Apple stock costs 316.85 \$.

I want to have the right to buy an Apple stock on Sep. 17, 2027 for 320\$.
How expensive should this "right" or "contract" be?

Surprising fact: There is a fair price, and we can find it using financial math.

The market says: 61.30 \$

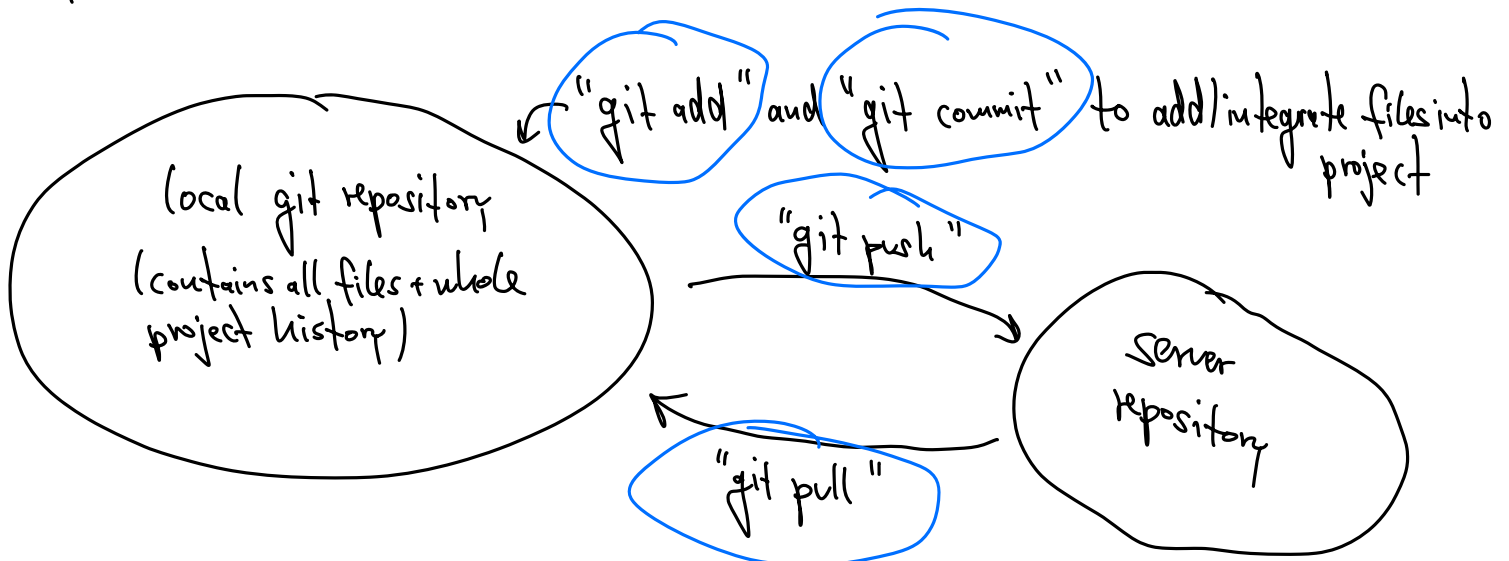
0. Intro to git and Scientific Python

0.1 git

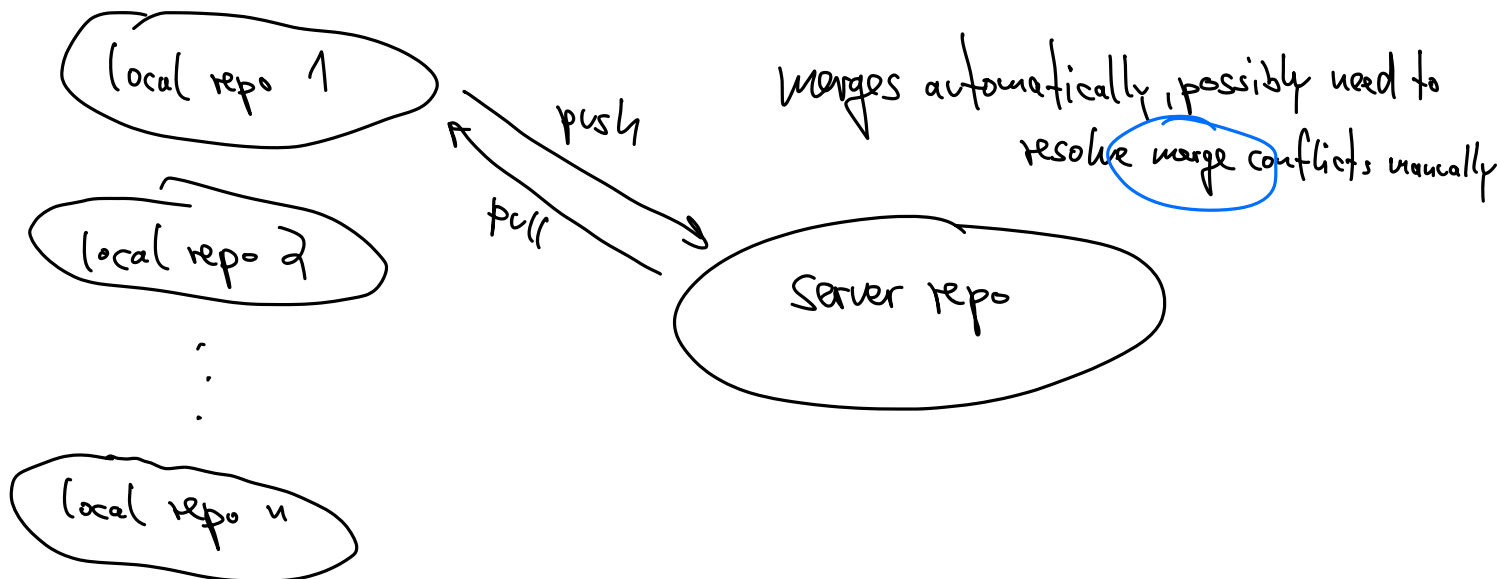
- version control software (free + open source), runs locally on your computer
- used for project development + large collaborations
 - ↳ predominantly software development (linux, recently windows, some google)
 - ↳ also for large scientific collaborations
- features:
 - track changes
 - go back to previous version
 - supports collaboration and different branches and merging
- main advantages:
 - speed + efficiency
 - non-linear workflows (file merging, different time stamps)

hosting server (stores project + some other things): **github**
(similar alternatives: bitbucket, gitlab)

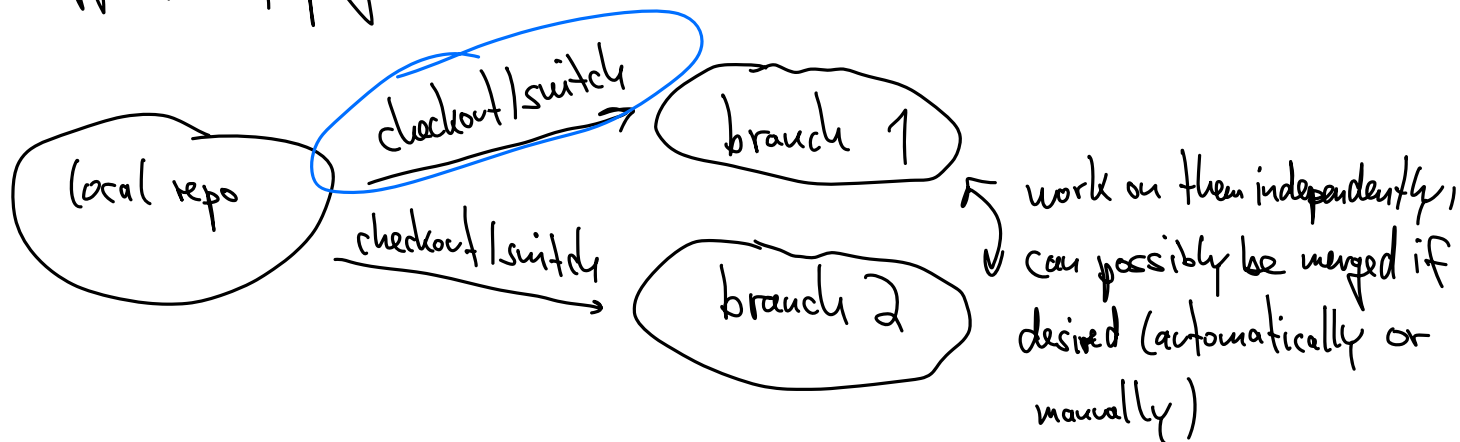
Structure + command overview:



There can be many local repositories:



Support many project branches



If possible: To Do for next week:

- github account
- install git
- install some python environment. Recommended:

Anaconda