1. Find recommend Bond Price with Coupon Rate = 5.5% and Maturity = 5 year for bond with
   - Plan vanilla Bond
   - Callable Bond with Call price = 103 USD, using Black-Derman-Toy model with 6-month interval & Binomial Tree to calculate bond price numerically.

   Write a python program to calculate bond price, program should be well-written, flexible enough to change input rate/maturity, and yield curve should be up to date (or able to select date)

2. Download following loan data
   https://www.dropbox.com/s/nmmy2afq1cmyb6g/loan_data.zip?dl=0
   Analyze loan data to identify probability of default base on client characters using Python Library or PySpark Library
3. Download Bitcoin historical data from any exchange using daily close price, find the following
   a. Historical, Implied, Stochastic, and Actual Volatility
   b. What's the difference of each volatility type? Which one to use in which case?
   c. Pricing European PUT option with strike price 20% less than current price using following method
      i. Black Scholes Model
      ii. Finite Difference
      iii. Monte Carlo Simulation
         1. Using proper volatility as calculate in 3a (with reason why choosing this volatility)
         2. Bootstrap of historical data
      iv. Explain why each result are difference and which one to choose.

All must be written in python (no limit on library usage).