

In [131...

```
pip install yfinance
```

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Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/public/simple/
Requirement already satisfied: yfinance in /usr/local/lib/python3.7/dist-packages (0.1.74)
Requirement already satisfied: multitasking>=0.0.7 in /usr/local/lib/python3.7/dist-packages (from yfinance) (0.0.11)
Requirement already satisfied: pandas>=0.24.0 in /usr/local/lib/python3.7/dist-packages (from yfinance) (1.3.5)
Requirement already satisfied: numpy>=1.15 in /usr/local/lib/python3.7/dist-packages (from yfinance) (1.21.6)
Requirement already satisfied: requests>=2.26 in /usr/local/lib/python3.7/dist-packages (from yfinance) (2.28.1)
Requirement already satisfied: lxml>=4.5.1 in /usr/local/lib/python3.7/dist-packages (from yfinance) (4.9.1)
Requirement already satisfied: python-dateutil>=2.7.3 in /usr/local/lib/python3.7/dist-packages (from pandas>=0.24.0->yfinance) (2.8.2)
Requirement already satisfied: pytz>=2017.3 in /usr/local/lib/python3.7/dist-packages (from pandas>=0.24.0->yfinance) (2022.1)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/dist-packages (from python-dateutil>=2.7.3->pandas>=0.24.0->yfinance) (1.15.0)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.7/dist-packages (from requests>=2.26->yfinance) (2022.6.15)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in /usr/local/lib/python3.7/dist-packages (from requests>=2.26->yfinance) (1.24.3)
Requirement already satisfied: charset-normalizer<3,>=2 in /usr/local/lib/python3.7/dist-packages (from requests>=2.26->yfinance) (2.1.0)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.7/dist-packages (from requests>=2.26->yfinance) (2.10)
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In [132...

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import pandas as pd
import yfinance as yf
import numpy as np
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In [133...

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current_age= int(input(' What is your current age? '))
retire_age = int(input(' What is your expected retiring age? '))
balance = int(input(' What is your current 401k balance? ').replace(',',' '))
inf_adj_balance=balance
employee_contribution= int(input(' How much are you contributing per year?').replace(',',' '))
etf=input('Please input a benchmark? SPY | IWM | DIA').upper()
salary = int(input('What is your annual salary? ').replace(',',' '))
salary_increase=int(input(' What is your expected rate of annual salary increase, in whole number % '))/100
matching_rate = int(input(' What is the 401k matching rate, in whole number % '))/100
inflation_rate= int(input(' What is the inflation rate, in whole number % '))/100
discount_rate= int(input(' What is the discount rate, in whole number % '))/100
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df = pd.DataFrame(yf.download(etf, period='10y')['Adj Close'])
ror = df['Adj Close'].pct_change(251).mean()/26. # 26 biweeks
period=0
year=0
inf_adjusted_ror = ((1+ror)/(1+inflation_rate/26))-1
for age in np.arange(current_age, retire_age, 1/26):
    period+=1
    if period % 26 ==0:
        salary = salary*(1+salary_increase)
        year+=1
    else:
        salary==salary
        year== year
    if (employee_contribution / salary) >= matching_rate:
        matching = salary * matching_rate
    else:
        matching = salary * (employee_contribution / salary)
    bi_weekly_employ_cont = employee_contribution/26
    bi_weekly_matching = matching/26
    balance = (balance * (ror + 1)) + bi_weekly_employ_cont + bi_weekly_matching
    inf_adj_balance= (inf_adj_balance * (inf_adjusted_ror + 1)) + bi_weekly_employ_cont + bi_weekly_matching

    npv_1= balance/(1+discount_rate/26)**year # when time of the cash flow is lower, using year
    # npv_1 = balance/(1+(discount_rate/26))**period #when time of the cash flow is higher, using period
    npv_2 = inf_adj_balance/(1+(discount_rate/26))**year
print('At the scheduled biweekly pay period:', period, ', expected age:', int(age),
      ', your 401k retirement plan balance before inflation adjustment is: $',
      "{:.2f}".format(balance),'\n','which has a NPV of: $', "{:.2f}".format(npv_1),
      'at the discount rate of:',discount_rate*100,'% ',
      ', your 401k retirement plan balance after inflation adjustment is: $',
      "{:.2f}".format(inf_adj_balance),'\n', 'which has a NPV of: $', "{:.2f}".format(npv_2),
      'at the discount rate of:',discount_rate*100,'% ')

```

What is your current age? 24
 What is your expected retiring age? 67
 What is your current 401k balance? 30000
 How much are you contributing per year?20500
 Please input a benchmark? SPY | IWM | DIA
 What is your annual salary? 100000
 What is your expected rate of annual salary increase, in whole number % 2
 What is the 401k matching rate, in whole number % 5
 What is the inflation rate, in whole number % 2
 What is the discount rate, in whole number % 2

[*****100%*****] 1 of 1 completed

At the scheduled biweekly pay period: 1118 , expected age: 66 , your 401k retirement plan balance before inflation adjustment is: \$ 136068291.78

which has a NPV of: \$ 131642866.28 at the discount rate of: 2.0 % , your 401k retirement plan balance after inflation adjustment is: \$ 65218103.24

which has a NPV of: \$ 63096978.22 at the discount rate of: 2.0 %

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current_age= int(input(' What is your current age? '))
retire_target = int(input('Your expected balance needed to retire? ').replace(',',' '))
balance = int(input(' What is your current 401k balance? ').replace(',',' '))
employee_contribution= int(input(' How much are you contributing per year?').replace(',',' '))
etf=input('Please input a benchmark? SPY | IWM | DIA').upper()
salary = int(input('What is your annual salary? ').replace(',',' '))
salary_increase=int(input(' What is your expected rate of annual salary increase, in whole number % '))/100
matching_rate = int(input(' What is the 401k matching rate, in whole number % '))/100
inflation_rate= int(input(' What is the inflation rate, in whole number % '))/100
discount_rate= int(input(' What is the discount rate, in whole number % '))/100

# current_age= 24
# retire_target = 3000000
# balance = 30000
# employee_contribution= 20500
# etf='SPY'
# salary = 100000
# salary_increase=2/100
# matching_rate = 5/100
# inflation_rate= 2/100
# discount_rate= 2/100

df = pd.DataFrame(yf.download(etf, period='10y')['Adj Close'])
ror = df['Adj Close'].pct_change(251).mean()/26. # 26 biweeks
period=0
year=0
inf_adjusted_ror = ((1+ror)/(1+inflation_rate/26))-1
while balance < retire_target:
    period+=1
    if period % 26 ==0:
        salary = salary*(1+salary_increase)
        year+=1
    else:
        salary==salary
        year== year
    if (employee_contribution / salary) >= matching_rate:
        matching = salary * matching_rate
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else:
    matching = salary * (employee_contribution / salary)
    bi_weekly_employ_cont = employee_contribution/26
    bi_weekly_matching = matching/26
    balance = (balance * (inf_adjusted_ror + 1)) + bi_weekly_employ_cont + bi_weekly_matching
    current_age+=1/26
    # inf_adj_balance= (inf_adj_balance * (inf_adjusted_ror + 1)) + bi_weekly_employ_cont + bi_weekly_matching

    npv_1= balance/(1+discount_rate/26)**year      # when time of the cash flow is lower, using year
    # npv_1 = balance/(1+(discount_rate/26)**period    #when time of the cash flow is higher, using period
    # npv_2 = inf_adj_balance/(1+(discount_rate/26)**year
print('At the scheduled biweekly pay period:', period, ', with the expected age:', int(current_age),
      ', you can achieve at your retirement target of: $', "{:.2f}".format(retire_target),
      '\n', 'after adjustment for inflation at', inflation_rate*100, '%',
      ', this balance has a NPV of: $', "{:.2f}".format(npv_1), 'at the discount rate of:',
      discount_rate*100, '%')

```

```

What is your current age? 24
Your expected balance needed to retire? 3000000
What is your current 401k balance? 30000
How much are you contributing per year?20500
Please input a benchmark? SPY | IWM | DIAspy
What is your annual salary? 100000
What is your expected rate of annual salary increase, in whole number % 2
What is the 401k matching rate, in whole number % 5
What is the inflation rate, in whole number % 2
What is the discount rate, in whole number % 2
[*****100%*****] 1 of 1 completed
At the scheduled biweekly pay period: 523 , with the expected age: 44 , you can achieve at your retirement target of: $ 3000000.00
after adjustment for inflation at 2.0 % , this balance has a NPV of: $ 2966371.03 at the discount rate of: 2.0 %

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CODE OR OTHER SOURCE:

I want acknowledge the cited works from professor John Droescher

<https://www.bankrate.com/retirement/retirement-plan-calculator/>