```
pip install yfinance
```

```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-whe
Collecting yfinance
  Downloading yfinance-0.1.74-py2.py3-none-any.whl (27 kB)
Requirement already satisfied: pandas>=0.24.0 in /usr/local/lib/python3.7/dist-p
Collecting lxml>=4.5.1
  Downloading lxml-4.9.1-cp37-cp37m-manylinux_2_17_x86_64.manylinux2014_x86_64.m
     |████████████████████████████████| 6.4 MB 7.3 MB/s
Requirement already satisfied: multitasking>=0.0.7 in /usr/local/lib/python3.7/d
Requirement already satisfied: numpy>=1.15 in /usr/local/lib/python3.7/dist-pack
Collecting requests>=2.26
  Downloading requests-2.28.1-py3-none-any.whl (62 kB)
     |████████████████████████████████| 62 kB 1.5 MB/s
Requirement already satisfied: python-dateutil>=2.7.3 in /usr/local/lib/python3.
Requirement already satisfied: pytz>=2017.3 in /usr/local/lib/python3.7/dist-pac
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.7/dist-package
Requirement already satisfied: charset-normalizer<3,>=2 in /usr/local/lib/python
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.7/dist-pac
Requirement already satisfied: urllib3<1.27,>=1.21.1 in /usr/local/lib/python3.7
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.7/di
Installing collected packages: requests, lxml, yfinance
  Attempting uninstall: requests
    Found existing installation: requests 2.23.0
    Uninstalling requests-2.23.0:
      Successfully uninstalled requests-2.23.0
  Attempting uninstall: lxml
    Found existing installation: lxml 4.2.6
    Uninstalling lxml-4.2.6:
      Successfully uninstalled lxml-4.2.6
ERROR: pip's dependency resolver does not currently take into account all the pa
google-colab 1.0.0 requires requests~=2.23.0, but you have requests 2.28.1 which
datascience 0.10.6 requires folium==0.2.1, but you have folium 0.8.3 which is in
Successfully installed lxml-4.9.1 requests-2.28.1 yfinance-0.1.74
WARNING: The following packages were previously imported in this runtime:
  [requests]
You must restart the runtime in order to use newly installed versions.
```

RESTART RUNTIME

```
import pandas as pd
import yfinance as yf
import numpy as np


sp500 = yf.Ticker('SPY')
russell = yf.Ticker('IWM')
dow = yf.Ticker('DIA')
'''
sp500.info
russell.info
```

```
dow.info
'''
```

```
'\nsp500.info\nrussell.info\ndow.info\n'
```

```
df = yf.download('SPY, IWM, DIA', start='2012-07-10', end='2022-07-10')
```

```
[**********100%**********]  3 of 3 completed
```

```
# df.head()
# df.columns
```

```
df_close=df['Adj Close'].mean()
df_open=df.Open.mean()
```

```
df=pd.concat([df_close, df_open], axis=1, keys=['close','open'])
df['rate_return/(365/14)']=(((df['open']-df['close'])/df['open']))/26
df
```

	close	open	rate_return/(365/14)
DIA	206.757060	225.105835	0.003135
IWM	134.435361	141.858430	0.002013
SPY	243.858225	261.928390	0.002653

```
current_age= int(input(' What is your current age? '))
retire_age = int(input(' What is your expected retiring age? '))
salary =float(input(' What is your current salary? '))
balance = float(input(' What is your current 401k balance? '))
ror=input('Please input a benchmark? SPY | IWM | DIA')
salary_increase=float(input(' What is your expected annual salary increase, in decimal
employee_contribution= int(input(' How much are you contributing per year?'))/26
matching_rate = float(input(' What is the 401k matching rate, in decimal form ? '))
match_ends=float(input(' What is the 401k matching ends, in decimal form ? '))/26
```

```
if ror =='SPY':
  ror=df['rate_return/(365/14)']['SPY']
elif ror=='IWM':
  ror=df['rate_return/(365/14)']['IWM']
else:
  ror=df['rate_return/(365/14)']['DIA']

for age in range(current_age, retire_age):
  period +=1
  if period == 1:
```

```
    if period == 1:
      salary== salary
      matching = (salary*match_ends)*matching_rate
      interest_gained= ror*(balance+employee_contribution+ matching)
      balance=(employee_contribution+balance + matching)*(1+ror)**period


    else:
      salary = min(salary*(1+salary_increase),250000)
      matching = (salary*match_ends)*matching_rate
      interest_gained= ror*(balance+employee_contribution+ matching)
      balance=(employee_contribution+balance + matching)*(1+ror)**period

print(' Age:', age,'\n', '401k Balance: $',round(balance,2))
```

```
 What is your current age? 24
 What is your expected retiring age? 67
 What is your current salary? 70000
 What is your current 401k balance? 30000
Please input a benchmark? SPY | IWM | DIASPY
 What is your expected annual salary increase, in decimal form ? 0.06
 How much are you contributing per year?20500
 What is the 401k matching rate, in decimal form ? 0.5
 What is the 401k matching ends, in decimal form ? 0.06
 Age: 66
 401k Balance: $ 61522223.88
```

✓ 0s completed at 10:59 PM