

Assignment3

Team4

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1. Github SSH key: git@github.com:JinzhouYao/Capstone_FRTB.git

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2. Market data

```
LIB3M_Team4 - Notepad
File Edit Format View Help
#
CCY      USD
INDEX    LIB3M
DATE     31/08/2016
ID       TEAM4
#Money   Market segment
USD      LIB3M      ZERO
1D       0.41944
2D       0.49
1W       0.44356
1M       0.52489
2M       0.663
3M       0.83933
#Extended All in Cost segment
USD      LIB3M      ZERO
1Y       0.96748
2Y       1.05462
3Y       1.11539
4Y       1.17041
5Y       1.22299
6Y       1.27543
7Y       1.32504
8Y       1.37053
9Y       1.41241
10Y      1.44975
12Y      1.51452
15Y      1.58328
20Y      1.65525
25Y      1.68476
30Y      1.70018
```

Cannot upload market data for IMA

P&V generator:

```
#data.at[0, 'IR']
PLL=[[], [], [], []]
k=0
for j in data.columns.tolist():
    for i in data.index:
        v1=data.at[i, j]
        v2=v1.copy()
        v2.insert(0, v1[0])
        v = list(map(lambda x: x[0]-x[1], zip(v1, v2)))
        del v[0]
        PLL[k].append(v)
        k+=1
dict2={'IR':PLL[0], 'FX':PLL[1], 'BQ':PLL[2], 'TOTAL':PLL[3]}
P_L = pd.DataFrame(dict2)
```

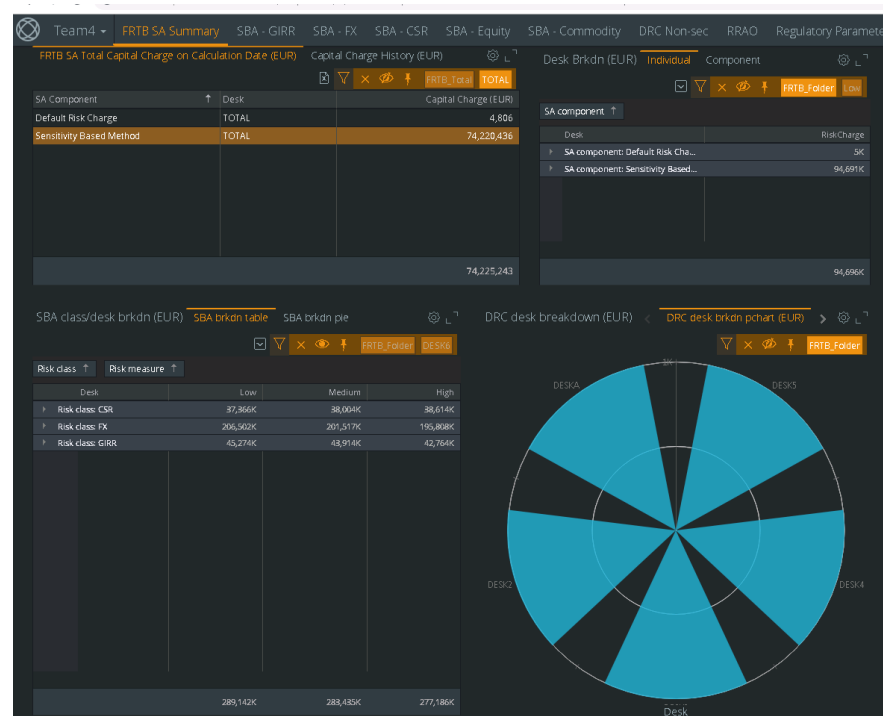
P_L

P&L result:

atLib():

	IR	FX	EQ	TOTAL
0	[-983991.2326491922, -307047.4845595956, -2432...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-983991.2326491922, -307047.4845595956, -2432...]
1	[-1680616.2934755087, -454369.6303000003, -334...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-1680616.2934755087, -454369.6303000003, -334...]
2	[-3842363.110558003, -1049673.9298900068, -824...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-3842363.110558003, -1049673.9298900068, -824...]
3	[-183926.35057376896, -23937.421615410014, 533...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-183926.35057376896, -23937.421615410014, 533...]
4	[-4308781.608589001, -1164777.8425522968, -914...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-4308781.608589001, -1164777.8425522968, -914...]
5	[-69515.83381301165, -17504.561387002468, -522...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-69515.83381301165, -17504.561387002468, -522...]
6	[-31.481785560958087, 293.0192113739904, -555...]	[-18563.34122829599, -1052.9931246499764, -534...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-18659.33930957096, -873.2121488400153, -5394...]
7	[-2.2034416371300267, 7.906335615670059, -4.32...]	[-1368.1176874615244, -692.3475521889047, -434...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-1371.056564936209, -685.1807147387302, -438...]
8	[-952.9663298819796, 824.5614199790289, 984.51...]	[-88377.38472473097, -44724.124644974014, -280...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-89356.55834828503, -43946.55732460297, -2707...]
9	[-6.567986117996043, 44.952118638990214, -81.7...]	[-17179.64365318499, -8693.904288913007, -5456...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-17195.42173860999, -8658.279529719002, -5536...]
10	[-4.121221756999148, 28.206156664004084, -51.2...]	[-10779.730371667101, -5455.173925809999, -342...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-10789.63064821496, -5432.820417892202, -347...]
11	[-284.4276231189724, 1021.4217095859349, -536...]	[-96537.098578237, 7929.866980326013, -38980.3...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-96914.245035995, 8851.228719678009, -39492.5...]
12	[-18.455588631288265, 196.14985842909664, -381...]	[-12815.415278592001, -726.9458666920109, -369...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-12878.410431066004, -608.9713214420044, -372...]
13	[-6.152991155398922, 8.472132255099496, -24.91...]	[-864.561994031701, 3707.986312395441, -2359.2...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-872.6175310880008, 3714.1600945401706, -2382...]
14	[-80.60854935180396, 86.3162011927925, -45.749...]	[-5299.584447765301, 8111.359637454589, -260.0...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-5389.640653463604, 8180.305895850601, -288.5...]
15	[-6.300846823320171, 6.741841640789971, -3.576...]	[-414.6694047855199, 634.6785688607997, -20.34...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-421.7094895759701, 640.06128811915, -22.5716...]
16	[-952.9663298819796, 824.5614199790289, 984.51...]	[-88377.38472473097, -44724.124644974014, -280...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-89356.55834828503, -43946.55732460297, -2707...]
17	[1981.3786531090736, -3870.35353410244, -1143...]	[76.76436479389668, 38.74741831421852, 24.2339...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[-3553.219375297427, -5943.763801798224, 1974...]
18	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, 0.0, ...]	[24960.0, -8580.0, -3900.0, 18720.0, -4680.0, ...]	[24960.0, -8580.0, -3900.0, 18720.0, -4680.0, ...]

3 SA setup has been done in assignment2, the result shows like this in dashboard:



4.ES calculator(source code and ES result are included into the zip file and uploaded to github)

```
import pandas as pd
import numpy as np
```

```
Data = pd.read_excel("HVAR_10D.xlsx")
```

```
L1=[] #IR pvList
L2=[] #FX pvList
L3=[] #EQ pvList
L4=[] #TOTAL pvList
for i in np.linspace(11,209,19):
    i=int(i)
    L1.append(list(map(float,Data.iloc[i+7,23].split(' '))))
    L2.append(list(map(float,Data.iloc[i+8,23].split(' '))))
    L3.append(list(map(float,Data.iloc[i+9,23].split(' '))))
    L4.append(list(map(float,Data.iloc[i+10,23].split(' '))))
dict1={'IR':L1,'FX':L2,'EQ':L3,'TOTAL':L4}
```

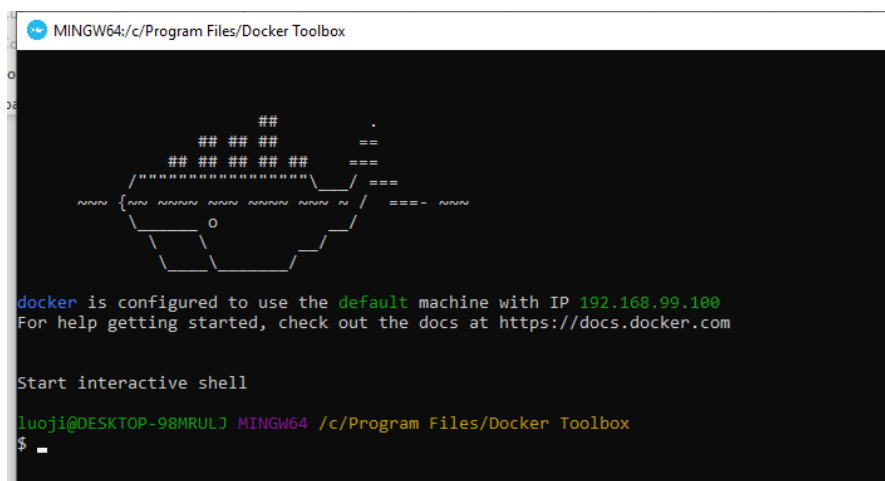
```
data = pd.DataFrame(dict1)
data
```

	IR	FX	EQ	TOTAL
0	[-67373616.077147, -68357607.3097962, -6866465...]	[-67547998.4371895, -67547998.4371895, -6754799...]	[-67547998.4371895, -67547998.4371895, -6754799...]	[-67373616.077147, -68357607.3097962, -6866465...]
1	[-75458297.9938788, -77138914.2873543, -775932...]	[-75713391.8956994, -75713391.8956994, -757133...]	[-75713391.8956994, -75713391.8956994, -757133...]	[-75458297.9938788, -77138914.2873543, -775932...]
2	[-250051210.04584, -253893573.156398, -2549432...]	[-250638036.666559, -250638036.666559, -250638...]	[-250638036.666559, -250638036.666559, -250638...]	[-250051210.04584, -253893573.156398, -2549432...]
3	[588481.309352287, 404554.958778518, 380617.53...]	[571643.227477206, 571643.227477206, 571643.22...]	[571643.227477206, 571643.227477206, 571643.22...]	[588481.309352287, 404554.958778518, 380617.53...]
4	[46201645.9016866, 41892864.2930976, 40728086...]	[45535163.7518075, 45535163.7518075, 45535163...]	[45535163.7518075, 45535163.7518075, 45535163...]	[46201645.9016866, 41892864.2930976, 40728086...]
5	[498793140.304264, 498723624.470451, 498706119...]	[498757047.517556, 498757047.517556, 498757047...]	[498757047.517556, 498757047.517556, 498757047...]	[498793140.304264, 498723624.470451, 498706119...]
6	[333453.865429285, 333422.383643724, 333715.40...]	[368265.397644302, 349702.056416006, 348649.06...]	[331766.739028523, 331766.739028523, 331766.73...]	[368528.164795524, 349868.825485953, 348995.61...]
7	[-1543.97922921035, -1546.18267084748, -1538.2...]	[1269.04377951392, -99.0739079476043, -791.421...]	[-1553.20211968964, -1553.20211968964, -1553.2...]	[1279.96990219093, -91.0866043026908, -776.267...]
8	[-460404.203369431, 461257.480800212, 460632...]	[-278646.690469507, 267024.075104739, 444749...]	[-460957.550059734, 460067.550059734, 460067...]	[-278008.612195129, 267365.470542414, 444214...]

```
1: def ES(PL: str) -> float:
    Data = pd.read_excel(PL)
    L1=[] #IR pvList
    L2=[] #FX pvList
    L3=[] #EQ pvList
    L4=[] #TOTAL pvList
    for i in np.linspace(11,209,19):
        i=int(i)
        L1.append(list(map(float,Data.iloc[i+7,23].split(' '))))
        L2.append(list(map(float,Data.iloc[i+8,23].split(' '))))
        L3.append(list(map(float,Data.iloc[i+9,23].split(' '))))
        L4.append(list(map(float,Data.iloc[i+10,23].split(' '))))
    dict1={'IR':L1,'FX':L2,'EQ':L3,'TOTAL':L4}
    data = pd.DataFrame(dict1)
    PLL=[[], [], [], []]
    k=0
    for j in data.columns.tolist():
        for i in data.index:
            v1=data.at[i,j]
            v2=v1.copy()
            v2.insert(0,v1[0])
            v = list(map(lambda x: x[0]-x[1], zip(v1, v2)))
            del v[0]
            PLL[k].append(v)
        k+=1
    dict2={'IR':PLL[0],'FX':PLL[1],'EQ':PLL[2],'TOTAL':PLL[3]}
    P_L = pd.DataFrame(dict2)
    ESL=[[], [], [], []]
    k=0
    for j in data.columns.tolist():
        for i in data.index:
            t1=P_L.at[i,j]
            t2=sorted(t1)
            cvar=t2[0]+t2[1]
            ESL[k].append(cvar)
        k+=1
    dict3={'ES_IR':ESL[0],'ES_FX':ESL[1],'ES_EQ':ESL[2],'ES_TOTAL':ESL[3]}
    ES = pd.DataFrame(dict3)
    ES.to_excel("ES.xlsx")
    ES("HVAR_10D.xlsx")
```

ES

	ES_IR	ES_FX	ES_EQ	ES_TOTAL
0	-3.770605e+06	0.000000e+00	0.0	-3.770605e+06
1	-5.027709e+06	0.000000e+00	0.0	-5.027709e+06
2	-1.218748e+07	0.000000e+00	0.0	-1.218748e+07
3	-9.785473e+05	0.000000e+00	0.0	-9.785473e+05
4	-1.390337e+07	0.000000e+00	0.0	-1.390337e+07
5	-3.427395e+05	0.000000e+00	0.0	-3.427395e+05
6	-3.446398e+03	-1.131203e+05	0.0	-1.131949e+05
7	-2.327813e+02	-1.729231e+04	0.0	-1.749852e+04
8	-4.300699e+04	-1.117045e+06	0.0	-1.161115e+06
9	-2.121613e+03	-2.171419e+05	0.0	-2.190931e+05
10	-1.331251e+03	-1.362503e+05	0.0	-1.374746e+05
11	-2.948029e+04	-1.693463e+06	0.0	-1.718113e+06
12	-2.377786e+03	-7.809389e+04	0.0	-7.814287e+04
13	-2.500321e+02	-3.279958e+04	0.0	-3.297197e+04
14	-7.710493e+02	-9.783211e+04	0.0	-9.770609e+04
15	-6.030636e+01	-7.654937e+03	0.0	-7.645085e+03
16	-4.300699e+04	-1.117045e+06	0.0	-1.161115e+06
17	-2.524062e+04	-2.025137e+02	0.0	-4.752402e+04
18	0.000000e+00	0.000000e+00	-115440.0	-1.154400e+05



As I follow the instruction on <https://docs.docker.com/get-started/>

Tested with hello-world

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

PS C:\Users\luoji> docker run hello-world

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
https://hub.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/get-started/

PS C:\Users\luoji>
```

However, when I proceed to next step on <https://docs.docker.com/get-started/part2/> to setup my container, it seems like there are some problems with my Powershell: I can't use create a file with vim, and I tried the New-Item command from powershell, it didn't work either

```
Directory: C:\Users\luoji\Docker

Mode                LastWriteTime         Length Name
----                -
d-----          6/25/2019   1:51 PM          Dockerfile

PS C:\Users\luoji\Docker> rm Dockerfile
PS C:\Users\luoji\Docker> New-Item -Path . -Name "Dockerfile" -ItemType "file" -Value "# Use an official Python runtime
as a parent image
>> FROM python:2.7-slim
>>
>> # Set the working directory to /app
>> WORKDIR /app
>>
>> # Copy the current directory contents into the container at /app
>> COPY . /app
>>
>> # Install any needed packages specified in requirements.txt
>> RUN pip install --trusted-host pypi.python.org -r requirements.txt
>>
>> # Make port 80 available to the world outside this container
>> EXPOSE 80
>>
>> # Define environment variable
>> ENV NAME World
>>
>> # Run app.py when the container launches
>> CMD ["python", "app.py"]"
New-Item : A positional parameter cannot be found that accepts argument 'python, app.py]'.
At line:1 char:1
+ New-Item -Path . -Name "Dockerfile" -ItemType "file" -Value "# Use an ...
+ ~~~~~
+ CategoryInfo          : InvalidArgument: (:) [New-Item], ParameterBindingException
+ FullyQualifiedErrorId : PositionalParameterNotFound,Microsoft.PowerShell.Commands.NewItemCommand

PS C:\Users\luoji\Docker> ls
PS C:\Users\luoji\Docker> vim
vim : The term 'vim' is not recognized as the name of a cmdlet, function, script file, or operable program. Check the
spelling of the name, or if a path was included, verify that the path is correct and try again.
At line:1 char:1
+ vim
+ ~~~
+ CategoryInfo          : ObjectNotFound: (vim:String) [], CommandNotFoundException
+ FullyQualifiedErrorId : CommandNotFoundException

PS C:\Users\luoji\Docker>
```

