Assignment3

Team4

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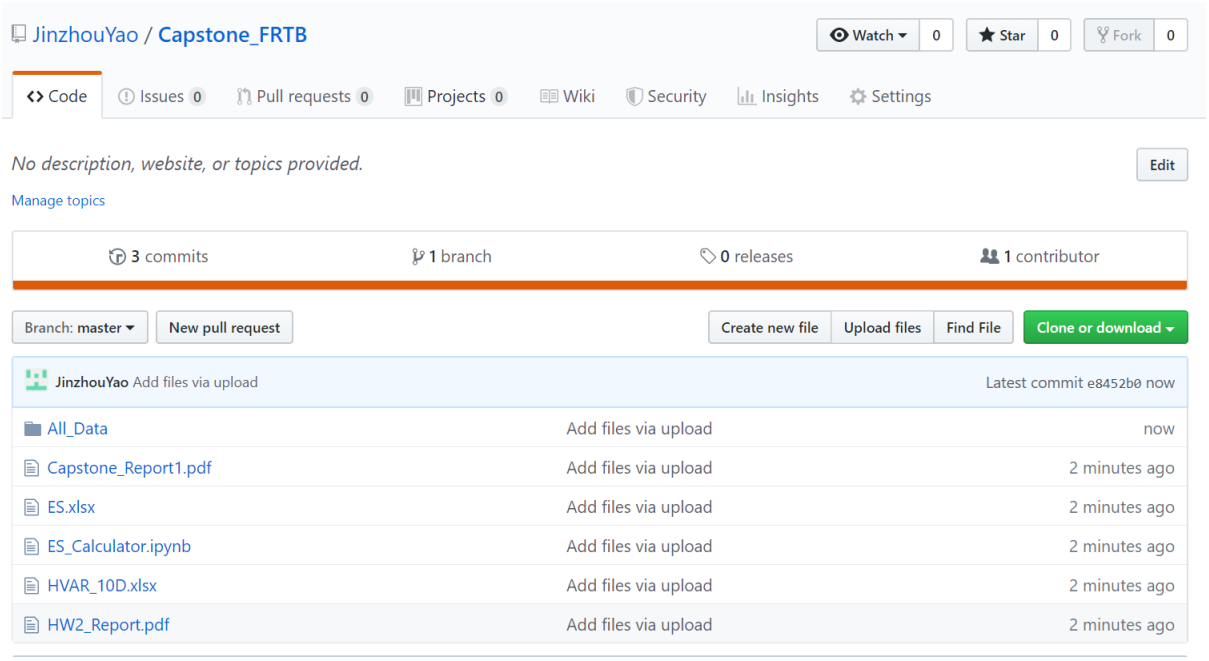
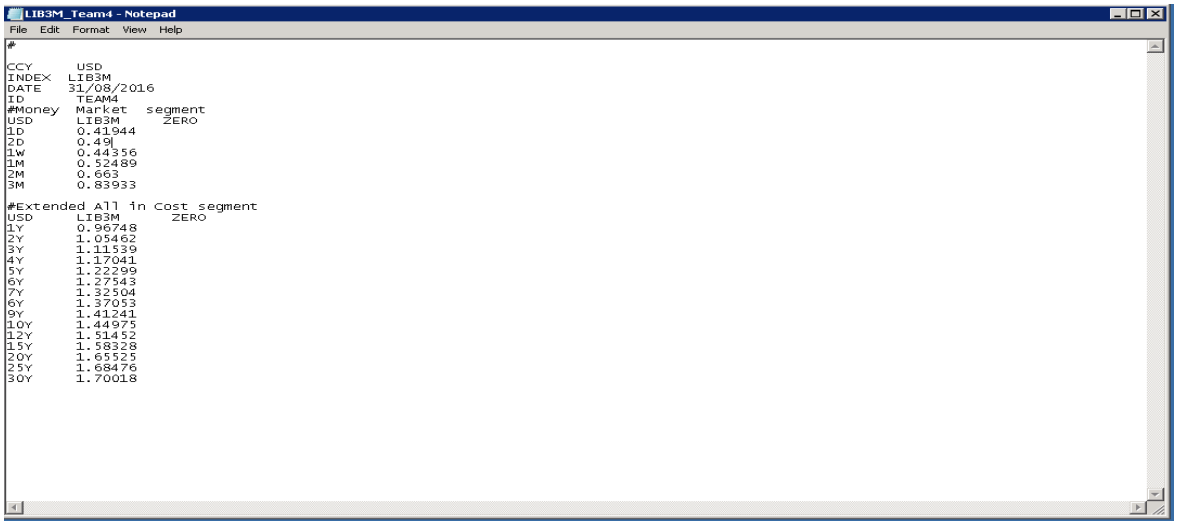
1. Github SSH key: git@github.com:JinzhouYao/Capstone_FRTB.git



2. Market data



Cannot upload market data for IMA

P&V generator:

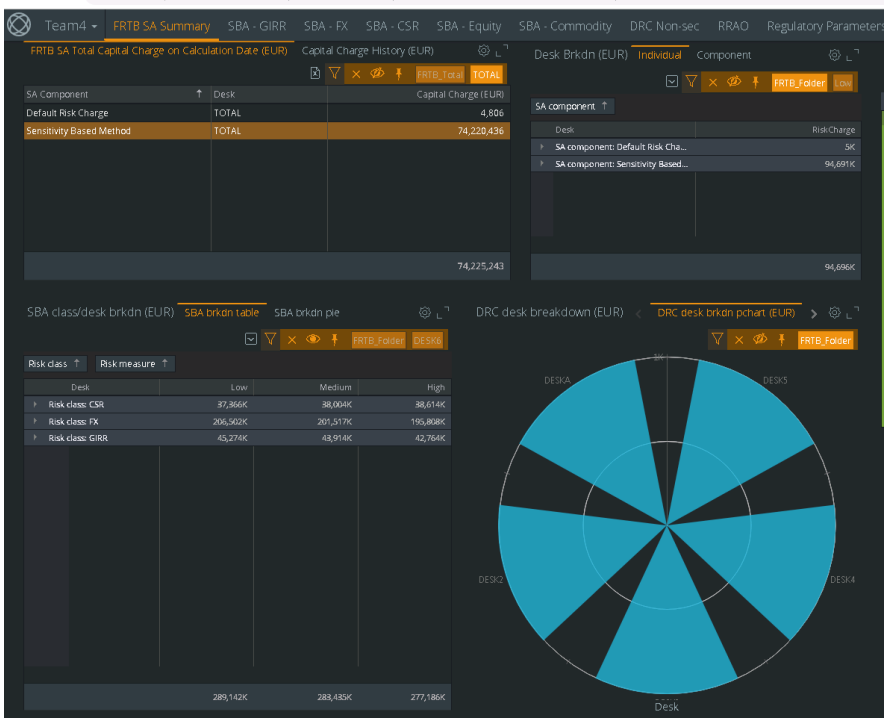
```
#data.at[0,'IR']
PLL=[[],[],[],[]]
k=0
for j in data.columns.tolist():
    for i in data.index:
        v1=data.at[i,j]
        v2=v1.copy()
        v2.insert(0,v1[0])
        v = list(map(lambda x: x[0]-x[1], zip(v1, v2)))
        del v[0]
        PLL[k].append(v)
    k+=1
dict2={'IR':PLL[0],'FX':PLL[1],'EQ':PLL[2],'TOTAL':PLL[3]}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

```
P_L
```

P&L result:

	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, ...	[-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, ...	[-1371.0565064936209, -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, ...	[-10789.630664821496, -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, -675479...	[-67547998.4371895, -67547998.4371895, -675479...	[-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, 461257.160600212, 460532...	[-278646.690469507, 267024.075194239, 411748...	[-460957.550059734, 460957.550059734, 460957...	[-278008.612195129, 267365.170543414, 411211...

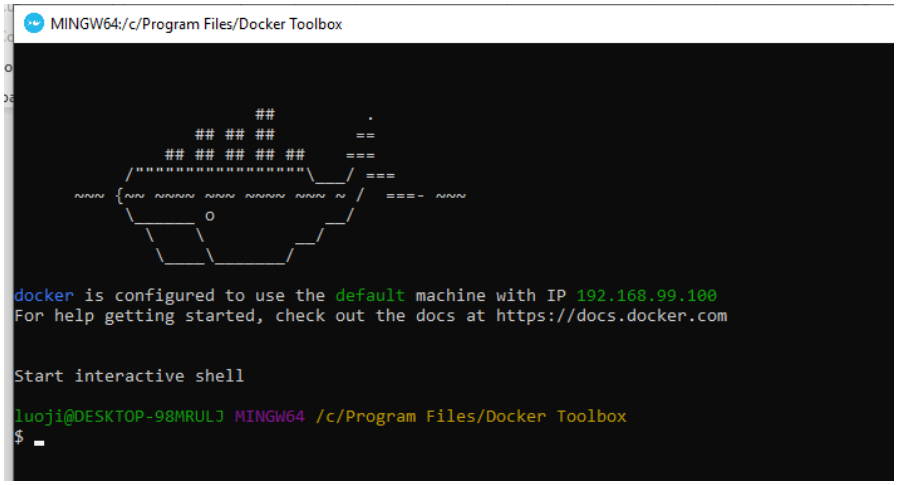
```
]: def ES(PL: str) -> float:
    Data = pd.read_excel(PL)
    L1=[] #IR pvList
    L2=[] #FX pvList
    L3=[] #EQ pvList
    L4=[] #TOTAL pvList
    for i in np.linspace(11,209,19):
        i=int(i)
        L1.append(list(map(float,Data.iloc[i+7,23].split(' '))))
        L2.append(list(map(float,Data.iloc[i+8,23].split(' '))))
        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")
```

```
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
```

	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

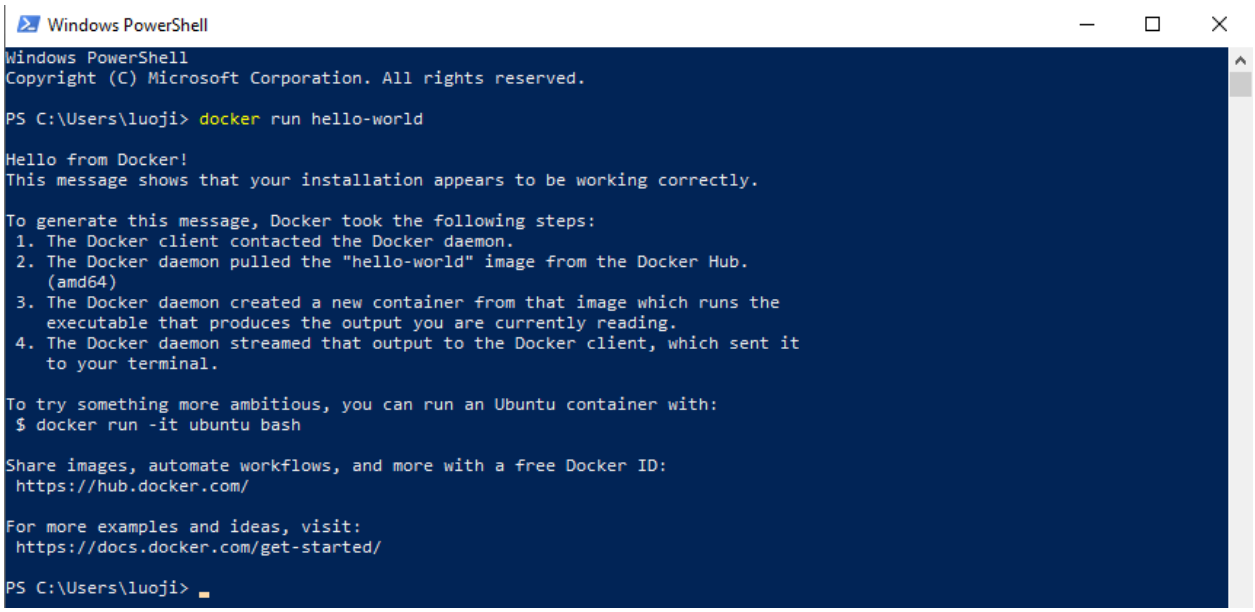
5.Docker



Docker Toolbox has been successfully installed (as Docker Desktop does not support Windows 10 Home)

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

Tested with hello-world



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 fromsss powershell, it didn't work either