```
--2024-02-11 20:56:55--  https://raw.githubusercontent.com/MarkovMarkowitz/MarkovMarkowitz/main/XLS-CSV/Best_PF_For_bist3
0.csv
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 185.199.111.133, 185.199.108.133, 185.199.109.133, ...
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|185.199.111.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 924 [text/plain]
Failed to rename Best_PF_For_bist30.csv to Best_PF_For_bist30.csv.1: (2) No such file or directory
Saving to: 'Best_PF_For_bist30.csv'

Best_PF_For_bist30. 100%[===================>]     924  --.-KB/s    in 0s

2024-02-11 20:56:56 (24.0 MB/s) - 'Best_PF_For_bist30.csv' saved [924/924]

--2024-02-11 20:56:56--  https://raw.githubusercontent.com/MarkovMarkowitz/MarkovMarkowitz/main/CUSTOMERS/NEG_SHARPE.csv
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 185.199.109.133, 185.199.108.133, 185.199.110.133, ...
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|185.199.109.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 724 [text/plain]
Failed to rename NEG_SHARPE.csv to NEG_SHARPE.csv.1: (2) No such file or directory
Saving to: 'NEG_SHARPE.csv'

NEG_SHARPE.csv      100%[===================>]     724  --.-KB/s    in 0s

2024-02-11 20:56:57 (8.64 MB/s) - 'NEG_SHARPE.csv' saved [724/724]


Current Date:  2024-02-11
45 days before current date:  2023-12-28
0 days before current date:  2024-02-12
```

```
Requirement already satisfied: pyfolio in /usr/local/lib/python3.10/dist-packages (0.9.2)
Requirement already satisfied: ipython>=3.2.3 in /usr/local/lib/python3.10/dist-packages (from pyfolio) (7.34.0)
Requirement already satisfied: matplotlib>=1.4.0 in /usr/local/lib/python3.10/dist-packages (from pyfolio) (3.7.1)
Requirement already satisfied: numpy>=1.11.1 in /usr/local/lib/python3.10/dist-packages (from pyfolio) (1.23.5)
Requirement already satisfied: pandas>=0.18.1 in /usr/local/lib/python3.10/dist-packages (from pyfolio) (1.5.3)
Requirement already satisfied: pytz>=2014.10 in /usr/local/lib/python3.10/dist-packages (from pyfolio) (2023.4)
Requirement already satisfied: scipy>=0.14.0 in /usr/local/lib/python3.10/dist-packages (from pyfolio) (1.11.4)
Requirement already satisfied: scikit-learn>=0.16.1 in /usr/local/lib/python3.10/dist-packages (from pyfolio) (1.2.2)
Requirement already satisfied: seaborn>=0.7.1 in /usr/local/lib/python3.10/dist-packages (from pyfolio) (0.13.1)
Requirement already satisfied: empyrical>=0.5.0 in /usr/local/lib/python3.10/dist-packages (from pyfolio) (0.5.5)
Requirement already satisfied: pandas-datareader>=0.2 in /usr/local/lib/python3.10/dist-packages (from empyrical>=0.5.0->
pyfolio) (0.10.0)
Requirement already satisfied: setuptools>=18.5 in /usr/local/lib/python3.10/dist-packages (from ipython>=3.2.3->pyfolio)
(67.7.2)
Requirement already satisfied: jedi>=0.16 in /usr/local/lib/python3.10/dist-packages (from ipython>=3.2.3->pyfolio) (0.19
.1)
Requirement already satisfied: decorator in /usr/local/lib/python3.10/dist-packages (from ipython>=3.2.3->pyfolio) (4.4.2
)
Requirement already satisfied: pickleshare in /usr/local/lib/python3.10/dist-packages (from ipython>=3.2.3->pyfolio) (0.7
.5)
Requirement already satisfied: traitlets>=4.2 in /usr/local/lib/python3.10/dist-packages (from ipython>=3.2.3->pyfolio) (
5.7.1)
Requirement already satisfied: prompt-toolkit!=3.0.0,!=3.0.1,<3.1.0,>=2.0.0 in /usr/local/lib/python3.10/dist-packages (f
rom ipython>=3.2.3->pyfolio) (3.0.43)
Requirement already satisfied: pygments in /usr/local/lib/python3.10/dist-packages (from ipython>=3.2.3->pyfolio) (2.16.1
)
Requirement already satisfied: backcall in /usr/local/lib/python3.10/dist-packages (from ipython>=3.2.3->pyfolio) (0.2.0)
Requirement already satisfied: matplotlib-inline in /usr/local/lib/python3.10/dist-packages (from ipython>=3.2.3->pyfolio
) (0.1.6)
Requirement already satisfied: pexpect>4.3 in /usr/local/lib/python3.10/dist-packages (from ipython>=3.2.3->pyfolio) (4.9
.0)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=1.4.0->pyfol
io) (1.2.0)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=1.4.0->pyfolio)
(0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=1.4.0->pyfo
lio) (4.48.1)
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=1.4.0->pyfo
lio) (1.4.5)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=1.4.0->pyfoli
o) (23.2)
Requirement already satisfied: pillow>=6.2.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=1.4.0->pyfolio)
(9.4.0)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=1.4.0->pyfol
io) (3.1.1)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (from matplotlib>=1.4.0->p
yfolio) (2.8.2)
Requirement already satisfied: joblib>=1.1.1 in /usr/local/lib/python3.10/dist-packages (from scikit-learn>=0.16.1->pyfol
io) (1.3.2)
Requirement already satisfied: threadpoolctl>=2.0.0 in /usr/local/lib/python3.10/dist-packages (from scikit-learn>=0.16.1
->pyfolio) (3.2.0)
Requirement already satisfied: parso<0.9.0,>=0.8.3 in /usr/local/lib/python3.10/dist-packages (from jedi>=0.16->ipython>=
3.2.3->pyfolio) (0.8.3)
Requirement already satisfied: lxml in /usr/local/lib/python3.10/dist-packages (from pandas-datareader>=0.2->empyrical>=0
.5.0->pyfolio) (4.9.4)
Requirement already satisfied: requests>=2.19.0 in /usr/local/lib/python3.10/dist-packages (from pandas-datareader>=0.2->
empyrical>=0.5.0->pyfolio) (2.31.0)
Requirement already satisfied: ptyprocess>=0.5 in /usr/local/lib/python3.10/dist-packages (from pexpect>4.3->ipython>=3.2
.3->pyfolio) (0.7.0)
Requirement already satisfied: wcwidth in /usr/local/lib/python3.10/dist-packages (from prompt-toolkit!=3.0.0,!=3.0.1,<3.
1.0,>=2.0.0->ipython>=3.2.3->pyfolio) (0.2.13)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.7->matplotlib
>=1.4.0->pyfolio) (1.16.0)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.10/dist-packages (from requests>=2.19.0
->pandas-datareader>=0.2->empyrical>=0.5.0->pyfolio) (3.3.2)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests>=2.19.0->pandas-dat
areader>=0.2->empyrical>=0.5.0->pyfolio) (3.6)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from requests>=2.19.0->pand
as-datareader>=0.2->empyrical>=0.5.0->pyfolio) (2.0.7)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.10/dist-packages (from requests>=2.19.0->pand
as-datareader>=0.2->empyrical>=0.5.0->pyfolio) (2024.2.2)
```

Special Eyes-Only Report on

Individual Portfolio Analysis and Further Suggestions

Report written by **Markov Markowitz Company**

Report issued on **27.08.2023**

Any comments should be sent to: info@markovmarkowitz.com

Step 1: Analysis of present portfolio

Dear Customer,

Per your request, we analysed your present portfolio, as of **27.08.2023** as follows:

	Symbol	Current Price	Date	Time	Change	Open	High	Low	Volume	Trade Date	Purchase Price	Quantity	Commission	L
Symbol														
IPEKE.IS	IPEKE.IS	39.02	2024/02/09	17:09 TRT	0.820000	38.40	39.44	38.34	8593095	20231226	29.82	623.0	NaN	
GUBRF.IS	GUBRF.IS	163.60	2024/02/09	17:09 TRT	5.600006	161.40	170.20	161.40	32624059	20231226	172.60	232.0	NaN	
AKFGY.IS	AKFGY.IS	2.32	2024/02/09	17:09 TRT	0.010000	2.32	2.34	2.28	122356431	20231226	1.75	21828.0	NaN	
KOZAL.IS	KOZAL.IS	22.14	2024/02/09	17:09 TRT	0.920000	21.36	22.44	21.34	198577157	20231226	18.99	8588.0	NaN	
AHGAZ.IS	AHGAZ.IS	13.51	2024/02/09	17:09 TRT	0.200000	13.34	13.70	13.26	14325825	20231226	9.62	48279.0	NaN	
TUKAS.IS	TUKAS.IS	8.84	2024/02/09	17:09 TRT	0.090000	8.75	9.04	8.71	27887920	20231226	6.30	42190.0	0.0	

1328252.8299999998

```
<ipython-input-108-ed49d056d309>:4: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  MYPF['Purchase Amount'] = np.trunc(MYPF['End PF %']*CURRENT_T2/100)
<ipython-input-108-ed49d056d309>:5: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  MYPF['End Quantity'] = np.trunc(MYPF['Purchase Amount'] / MYPF['Current Price'])
<ipython-input-108-ed49d056d309>:7: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  MYPF.dropna(inplace=True)
```
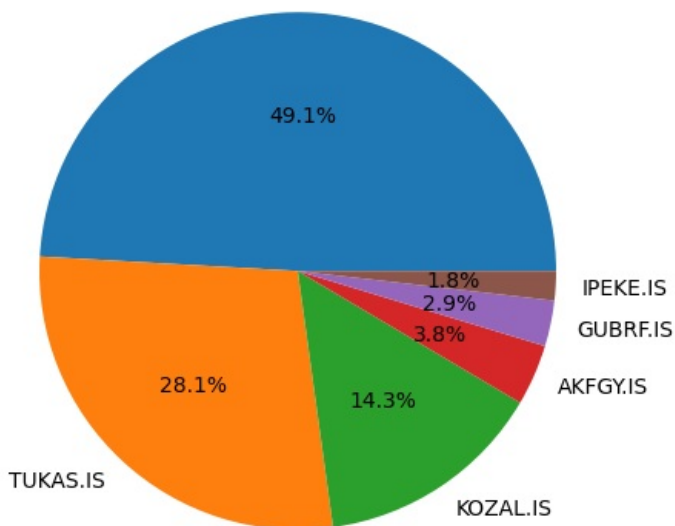
	Quantity	Purchase Price	Purchased Value	Current Price	Market Value	Start PF %	End PF %	PnL %	Purchase Amount	End Quantity
Symbol										
AHGAZ.IS	48279.0	9.62	464443.98	13.51	652249.29	46.90656	49.10581	40.436590	652249.0	48278.0
TUKAS.IS	42190.0	6.30	265797.00	8.84	372959.60	26.84419	28.07896	40.317460	372959.0	42189.0
KOZAL.IS	8588.0	18.99	163086.12	22.14	190138.32	16.47090	14.31492	16.587678	190138.0	8587.0
GUBRF.IS	232.0	172.60	40043.20	163.60	37955.20	4.04417	2.85753	-5.214368	37955.0	231.0
AKFGY.IS	21828.0	1.75	38199.00	2.32	50640.96	3.85791	3.81260	32.571429	50640.0	21827.0
IPEKE.IS	623.0	29.82	18577.86	39.02	24309.46	1.87627	1.83018	30.851777	24309.0	622.0

NEG_SHARPE.csv Portfolio

NEG_SHARPE.csv Portfolio Returns (%)
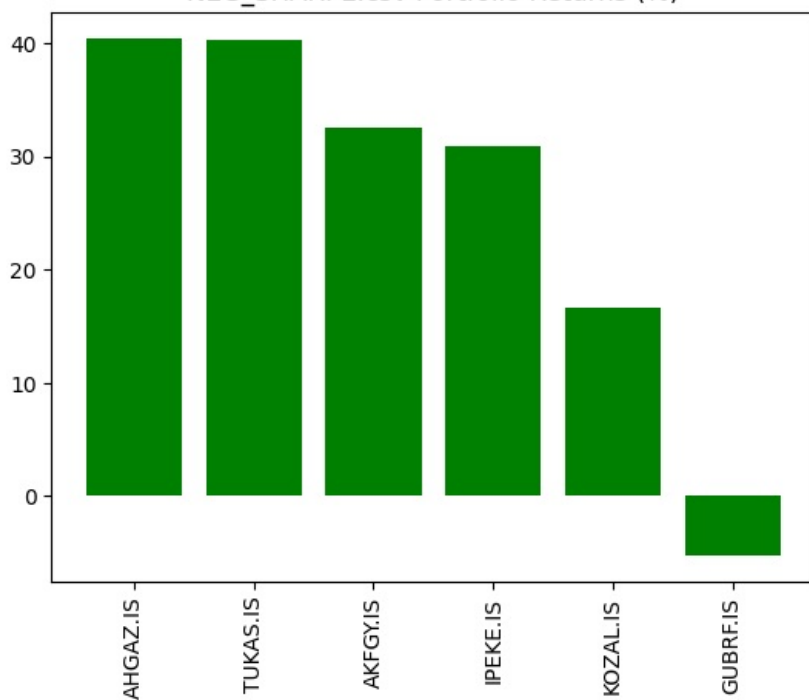
Symbol	Quantity	Purchase Price	Purchased Value	Current Price	Market Value	Start PF %	End PF %	PnL %	Purchase Amount	End Quantity
AHGAZ.IS	48279.0	9.62	464443.98	13.51	652249.29	46.90656	49.10581	40.436590	652249.0	48278.0
TUKAS.IS	42190.0	6.30	265797.00	8.84	372959.60	26.84419	28.07896	40.317460	372959.0	42189.0
KOZAL.IS	8588.0	18.99	163086.12	22.14	190138.32	16.47090	14.31492	16.587678	190138.0	8587.0
AKFGY.IS	21828.0	1.75	38199.00	2.32	50640.96	3.85791	3.81260	32.571429	50640.0	21827.0
GUBRF.IS	232.0	172.60	40043.20	163.60	37955.20	4.04417	2.85753	-5.214368	37955.0	231.0
IPEKE.IS	623.0	29.82	18577.86	39.02	24309.46	1.87627	1.83018	30.851777	24309.0	622.0

```
Dear Customer, now starting to analyze your current portfolio performance...
----------------------------------------------------------------
----------------------------------------------------------------
****************************************************************
Starting Download ...
****************************************************************
Downloading AHGAZ.IS
Downloading TUKAS.IS
Downloading KOZAL.IS
Downloading AKFGY.IS
Downloading GUBRF.IS
```

```
Downloading IPEKE.IS
****************************************************************
****************************************************************
[                            Open   High    Low  Close      Volume  Dividends  \
Date
2023-12-28 00:00:00+03:00   8.91   9.73   8.83   9.73    32468930        0.0
2023-12-29 00:00:00+03:00   9.71  10.65   9.57  10.24    22037878        0.0
2024-01-02 00:00:00+03:00  10.25  10.55  10.25  10.31     9060918        0.0
2024-01-03 00:00:00+03:00  10.39  10.39   9.85   9.90     9493398        0.0
2024-01-04 00:00:00+03:00  10.01  10.15   9.85  10.15     4933550        0.0
2024-01-05 00:00:00+03:00  10.15  10.26  10.05  10.21     5347975        0.0
2024-01-08 00:00:00+03:00  10.25  10.41  10.19  10.32     7256524        0.0
2024-01-09 00:00:00+03:00  10.32  10.40   9.98  10.04     7813816        0.0
2024-01-10 00:00:00+03:00  10.05  10.14   9.98  10.10     6712042        0.0
2024-01-11 00:00:00+03:00  10.11  10.31  10.10  10.22     8071099        0.0
2024-01-12 00:00:00+03:00  10.22  10.45  10.14  10.36    11237474        0.0
2024-01-15 00:00:00+03:00  10.37  10.87  10.36  10.64    10525957        0.0
2024-01-16 00:00:00+03:00  10.64  10.73  10.51  10.56     7262699        0.0
2024-01-17 00:00:00+03:00  10.56  10.73  10.54  10.72     6850278        0.0
2024-01-18 00:00:00+03:00  10.82  11.06  10.73  11.00     9525878        0.0
2024-01-19 00:00:00+03:00  11.02  12.10  11.02  12.10    32301809        0.0
2024-01-22 00:00:00+03:00  12.23  12.96  12.13  12.18    36515079        0.0
2024-01-23 00:00:00+03:00  12.21  12.38  12.05  12.09    16786431        0.0
2024-01-24 00:00:00+03:00  12.15  12.24  12.06  12.12     9671255        0.0
2024-01-25 00:00:00+03:00  12.14  12.49  12.04  12.29    13525207        0.0
2024-01-26 00:00:00+03:00  12.40  12.62  12.32  12.58    11627541        0.0
2024-01-29 00:00:00+03:00  12.79  12.79  12.47  12.70    11994428        0.0
2024-01-30 00:00:00+03:00  12.83  12.90  12.64  12.79     8928096        0.0
2024-01-31 00:00:00+03:00  12.80  12.86  12.60  12.68     8893723        0.0
2024-02-01 00:00:00+03:00  12.71  12.82  12.66  12.73    10164800        0.0
2024-02-02 00:00:00+03:00  12.76  13.83  12.67  13.30    32678979        0.0
2024-02-05 00:00:00+03:00  13.29  13.36  13.06  13.11    11631889        0.0
2024-02-06 00:00:00+03:00  13.14  13.39  13.06  13.24    12457518        0.0
2024-02-07 00:00:00+03:00  13.28  13.60  13.25  13.31    14795491        0.0
2024-02-08 00:00:00+03:00  13.35  13.47  13.24  13.31     9137159        0.0
2024-02-09 00:00:00+03:00  13.34  13.70  13.26  13.51    14325825        0.0

                           Stock Splits
Date
2023-12-28 00:00:00+03:00           0.0
2023-12-29 00:00:00+03:00           0.0
2024-01-02 00:00:00+03:00           0.0
2024-01-03 00:00:00+03:00           0.0
2024-01-04 00:00:00+03:00           0.0
2024-01-05 00:00:00+03:00           0.0
2024-01-08 00:00:00+03:00           0.0
2024-01-09 00:00:00+03:00           0.0
2024-01-10 00:00:00+03:00           0.0
2024-01-11 00:00:00+03:00           0.0
2024-01-12 00:00:00+03:00           0.0
2024-01-15 00:00:00+03:00           0.0
2024-01-16 00:00:00+03:00           0.0
2024-01-17 00:00:00+03:00           0.0
2024-01-18 00:00:00+03:00           0.0
2024-01-19 00:00:00+03:00           0.0
2024-01-22 00:00:00+03:00           0.0
2024-01-23 00:00:00+03:00           0.0
2024-01-24 00:00:00+03:00           0.0
2024-01-25 00:00:00+03:00           0.0
2024-01-26 00:00:00+03:00           0.0
2024-01-29 00:00:00+03:00           0.0
2024-01-30 00:00:00+03:00           0.0
2024-01-31 00:00:00+03:00           0.0
2024-02-01 00:00:00+03:00           0.0
2024-02-02 00:00:00+03:00           0.0
2024-02-05 00:00:00+03:00           0.0
2024-02-06 00:00:00+03:00           0.0
2024-02-07 00:00:00+03:00           0.0
2024-02-08 00:00:00+03:00           0.0
2024-02-09 00:00:00+03:00           0.0  ,                            Open  High   Low  Close      Volume  Dividends  \
Date
2023-12-28 00:00:00+03:00   6.40   7.04   6.40   6.63    13385860        0.0
2023-12-29 00:00:00+03:00   6.65   6.86   6.52   6.83     9575663        0.0
2024-01-02 00:00:00+03:00   6.86   7.10   6.86   7.10    12066222        0.0
2024-01-03 00:00:00+03:00   7.10   7.11   6.76   6.76    11569759        0.0
2024-01-04 00:00:00+03:00   6.76   6.87   6.68   6.84     8574842        0.0
2024-01-05 00:00:00+03:00   6.83   6.98   6.82   6.94     7187678        0.0
2024-01-08 00:00:00+03:00   6.94   7.19   6.94   7.11    12716049        0.0
2024-01-09 00:00:00+03:00   7.18   7.20   6.88   6.94    10043692        0.0
2024-01-10 00:00:00+03:00   6.94   7.00   6.85   6.94     7681363        0.0
2024-01-11 00:00:00+03:00   6.96   7.08   6.89   6.93     9260303        0.0
2024-01-12 00:00:00+03:00   6.92   7.23   6.81   7.15    24809529        0.0
2024-01-15 00:00:00+03:00   7.15   7.25   7.06   7.09    15619836        0.0
2024-01-16 00:00:00+03:00   7.10   7.21   7.04   7.15    14340047        0.0
2024-01-17 00:00:00+03:00   7.13   7.31   7.11   7.25    14691358        0.0
2024-01-18 00:00:00+03:00   7.28   7.79   7.28   7.41    28027187        0.0
2024-01-19 00:00:00+03:00   7.42   7.52   7.33   7.38    11088326        0.0
2024-01-22 00:00:00+03:00   7.38   7.51   7.32   7.38    10403833        0.0
2024-01-23 00:00:00+03:00   7.48   7.56   7.27   7.31    14133935        0.0
```

```
2024-01-24 00:00:00+03:00  7.32  7.48  7.25  7.47  11583644       0.0
2024-01-25 00:00:00+03:00  7.49  7.64  7.47  7.55  12806122       0.0
2024-01-26 00:00:00+03:00  7.55  7.68  7.50  7.66  15597975       0.0
2024-01-29 00:00:00+03:00  7.70  7.86  7.66  7.71  17259990       0.0
2024-01-30 00:00:00+03:00  7.80  7.83  7.63  7.63  13820766       0.0
2024-01-31 00:00:00+03:00  7.63  8.39  7.59  8.39  60425320       0.0
2024-02-01 00:00:00+03:00  8.39  9.03  8.23  8.59  85787413       0.0
2024-02-02 00:00:00+03:00  8.61  8.78  8.40  8.43  29833301       0.0
2024-02-05 00:00:00+03:00  8.42  8.54  8.37  8.52  17218886       0.0
2024-02-06 00:00:00+03:00  8.55  8.79  8.39  8.53  26530320       0.0
2024-02-07 00:00:00+03:00  8.54  8.69  8.42  8.42  21308758       0.0
2024-02-08 00:00:00+03:00  8.42  8.86  8.42  8.75  38149758       0.0
2024-02-09 00:00:00+03:00  8.75  9.04  8.71  8.84  27887920       0.0

                          Stock Splits
Date
2023-12-28 00:00:00+03:00          0.0
2023-12-29 00:00:00+03:00          0.0
2024-01-02 00:00:00+03:00          0.0
2024-01-03 00:00:00+03:00          0.0
2024-01-04 00:00:00+03:00          0.0
2024-01-05 00:00:00+03:00          0.0
2024-01-08 00:00:00+03:00          0.0
2024-01-09 00:00:00+03:00          0.0
2024-01-10 00:00:00+03:00          0.0
2024-01-11 00:00:00+03:00          0.0
2024-01-12 00:00:00+03:00          0.0
2024-01-15 00:00:00+03:00          0.0
2024-01-16 00:00:00+03:00          0.0
2024-01-17 00:00:00+03:00          0.0
2024-01-18 00:00:00+03:00          0.0
2024-01-19 00:00:00+03:00          0.0
2024-01-22 00:00:00+03:00          0.0
2024-01-23 00:00:00+03:00          0.0
2024-01-24 00:00:00+03:00          0.0
2024-01-25 00:00:00+03:00          0.0
2024-01-26 00:00:00+03:00          0.0
2024-01-29 00:00:00+03:00          0.0
2024-01-30 00:00:00+03:00          0.0
2024-01-31 00:00:00+03:00          0.0
2024-02-01 00:00:00+03:00          0.0
2024-02-02 00:00:00+03:00          0.0
2024-02-05 00:00:00+03:00          0.0
2024-02-06 00:00:00+03:00          0.0
2024-02-07 00:00:00+03:00          0.0
2024-02-08 00:00:00+03:00          0.0
2024-02-09 00:00:00+03:00          0.0  ,                                 Open   High   Low  Close     Volume  Dividends  \
Date
2023-12-28 00:00:00+03:00  19.27  19.87  19.27  19.57   53545992       0.0
2023-12-29 00:00:00+03:00  19.57  19.80  19.16  19.53   54120248       0.0
2024-01-02 00:00:00+03:00  19.64  19.96  19.60  19.91   59312280       0.0
2024-01-03 00:00:00+03:00  19.89  20.46  19.18  19.22   76622403       0.0
2024-01-04 00:00:00+03:00  19.18  19.69  19.06  19.67   54422489       0.0
2024-01-05 00:00:00+03:00  19.65  19.68  19.33  19.65   42220960       0.0
2024-01-08 00:00:00+03:00  19.75  19.99  19.69  19.78   59592076       0.0
2024-01-09 00:00:00+03:00  19.86  20.36  19.45  19.45  100762759       0.0
2024-01-10 00:00:00+03:00  19.45  19.77  19.39  19.60   76421569       0.0
2024-01-11 00:00:00+03:00  19.69  20.24  19.68  19.91   99894500       0.0
2024-01-12 00:00:00+03:00  19.75  21.52  19.61  20.40  104541215       0.0
2024-01-15 00:00:00+03:00  20.62  20.68  20.24  20.40   78625843       0.0
2024-01-16 00:00:00+03:00  20.50  20.60  20.28  20.34   97909181       0.0
2024-01-17 00:00:00+03:00  20.20  20.68  20.18  20.36   86451182       0.0
2024-01-18 00:00:00+03:00  20.54  20.58  20.10  20.12   61984547       0.0
2024-01-19 00:00:00+03:00  20.20  20.36  20.04  20.20   57472001       0.0
2024-01-22 00:00:00+03:00  20.14  20.54  20.04  20.10   63079803       0.0
2024-01-23 00:00:00+03:00  20.32  20.42  19.67  19.71   62179637       0.0
2024-01-24 00:00:00+03:00  19.78  20.10  19.53  19.93   65172606       0.0
2024-01-25 00:00:00+03:00  20.06  20.56  20.04  20.48   79808812       0.0
2024-01-26 00:00:00+03:00  20.54  20.92  20.34  20.88   90080307       0.0
2024-01-29 00:00:00+03:00  21.00  21.14  20.76  20.94   83930939       0.0
2024-01-30 00:00:00+03:00  21.00  21.20  20.64  20.74   77453129       0.0
2024-01-31 00:00:00+03:00  20.68  21.04  20.54  20.76   74256285       0.0
2024-02-01 00:00:00+03:00  20.78  21.42  20.78  21.20  107342912       0.0
2024-02-02 00:00:00+03:00  21.32  21.84  20.96  21.08   84025048       0.0
2024-02-05 00:00:00+03:00  21.24  21.38  21.10  21.36   68558234       0.0
2024-02-06 00:00:00+03:00  21.42  21.46  21.08  21.24   93998050       0.0
2024-02-07 00:00:00+03:00  21.30  21.60  21.08  21.12  103487365       0.0
2024-02-08 00:00:00+03:00  21.18  21.44  21.12  21.22   73679521       0.0
2024-02-09 00:00:00+03:00  21.36  22.44  21.34  22.14  198577157       0.0

                          Stock Splits
Date
2023-12-28 00:00:00+03:00          0.0
2023-12-29 00:00:00+03:00          0.0
2024-01-02 00:00:00+03:00          0.0
2024-01-03 00:00:00+03:00          0.0
2024-01-04 00:00:00+03:00          0.0
2024-01-05 00:00:00+03:00          0.0
2024-01-08 00:00:00+03:00          0.0
```

```
2024-01-09 00:00:00+03:00             0.0
2024-01-10 00:00:00+03:00             0.0
2024-01-11 00:00:00+03:00             0.0
2024-01-12 00:00:00+03:00             0.0
2024-01-15 00:00:00+03:00             0.0
2024-01-16 00:00:00+03:00             0.0
2024-01-17 00:00:00+03:00             0.0
2024-01-18 00:00:00+03:00             0.0
2024-01-19 00:00:00+03:00             0.0
2024-01-22 00:00:00+03:00             0.0
2024-01-23 00:00:00+03:00             0.0
2024-01-24 00:00:00+03:00             0.0
2024-01-25 00:00:00+03:00             0.0
2024-01-26 00:00:00+03:00             0.0
2024-01-29 00:00:00+03:00             0.0
2024-01-30 00:00:00+03:00             0.0
2024-01-31 00:00:00+03:00             0.0
2024-02-01 00:00:00+03:00             0.0
2024-02-02 00:00:00+03:00             0.0
2024-02-05 00:00:00+03:00             0.0
2024-02-06 00:00:00+03:00             0.0
2024-02-07 00:00:00+03:00             0.0
2024-02-08 00:00:00+03:00             0.0
2024-02-09 00:00:00+03:00             0.0  ,                                    Open  High  Low  Close     Volume  Dividends  \
Date
2023-12-28 00:00:00+03:00  1.74  1.88  1.73  1.86   50808962         0.0
2023-12-29 00:00:00+03:00  1.87  1.99  1.86  1.97   82159763         0.0
2024-01-02 00:00:00+03:00  1.98  2.00  1.94  1.95   63375293         0.0
2024-01-03 00:00:00+03:00  1.96  1.99  1.83  1.84   81968946         0.0
2024-01-04 00:00:00+03:00  1.84  1.89  1.83  1.86   58666544         0.0
2024-01-05 00:00:00+03:00  1.87  1.89  1.81  1.83  112359180         0.0
2024-01-08 00:00:00+03:00  1.84  1.91  1.83  1.90  102551570         0.0
2024-01-09 00:00:00+03:00  1.90  1.93  1.85  1.86   86342337         0.0
2024-01-10 00:00:00+03:00  1.86  1.92  1.83  1.88   82570189         0.0
2024-01-11 00:00:00+03:00  1.89  1.92  1.87  1.91   70334251         0.0
2024-01-12 00:00:00+03:00  1.89  1.92  1.86  1.89   86424381         0.0
2024-01-15 00:00:00+03:00  1.89  1.94  1.89  1.91  108663211         0.0
2024-01-16 00:00:00+03:00  1.92  1.95  1.90  1.90   98471508         0.0
2024-01-17 00:00:00+03:00  1.90  1.95  1.87  1.89  193040265         0.0
2024-01-18 00:00:00+03:00  1.91  1.93  1.87  1.87  112084594         0.0
2024-01-19 00:00:00+03:00  1.88  1.90  1.86  1.87   61290129         0.0
2024-01-22 00:00:00+03:00  1.87  1.93  1.87  1.91  119821528         0.0
2024-01-23 00:00:00+03:00  1.93  1.97  1.92  1.92  223640437         0.0
2024-01-24 00:00:00+03:00  1.93  1.96  1.92  1.95  124509808         0.0
2024-01-25 00:00:00+03:00  1.97  2.07  1.96  2.04  174690600         0.0
2024-01-26 00:00:00+03:00  2.05  2.11  2.02  2.08  135196223         0.0
2024-01-29 00:00:00+03:00  2.10  2.12  2.03  2.04  136507537         0.0
2024-01-30 00:00:00+03:00  2.05  2.06  2.02  2.02   87555337         0.0
2024-01-31 00:00:00+03:00  2.02  2.08  2.01  2.05  122793851         0.0
2024-02-01 00:00:00+03:00  2.05  2.12  2.05  2.09  160233716         0.0
2024-02-02 00:00:00+03:00  2.10  2.20  2.09  2.16  205153896         0.0
2024-02-05 00:00:00+03:00  2.18  2.23  2.16  2.19  164586910         0.0
2024-02-06 00:00:00+03:00  2.20  2.23  2.16  2.19  147486841         0.0
2024-02-07 00:00:00+03:00  2.20  2.30  2.19  2.24  234524046         0.0
2024-02-08 00:00:00+03:00  2.24  2.34  2.24  2.31  172033417         0.0
2024-02-09 00:00:00+03:00  2.32  2.34  2.28  2.32  122356431         0.0

                           Stock Splits
Date
2023-12-28 00:00:00+03:00           0.0
2023-12-29 00:00:00+03:00           0.0
2024-01-02 00:00:00+03:00           0.0
2024-01-03 00:00:00+03:00           0.0
2024-01-04 00:00:00+03:00           0.0
2024-01-05 00:00:00+03:00           0.0
2024-01-08 00:00:00+03:00           0.0
2024-01-09 00:00:00+03:00           0.0
2024-01-10 00:00:00+03:00           0.0
2024-01-11 00:00:00+03:00           0.0
2024-01-12 00:00:00+03:00           0.0
2024-01-15 00:00:00+03:00           0.0
2024-01-16 00:00:00+03:00           0.0
2024-01-17 00:00:00+03:00           0.0
2024-01-18 00:00:00+03:00           0.0
2024-01-19 00:00:00+03:00           0.0
2024-01-22 00:00:00+03:00           0.0
2024-01-23 00:00:00+03:00           0.0
2024-01-24 00:00:00+03:00           0.0
2024-01-25 00:00:00+03:00           0.0
2024-01-26 00:00:00+03:00           0.0
2024-01-29 00:00:00+03:00           0.0
2024-01-30 00:00:00+03:00           0.0
2024-01-31 00:00:00+03:00           0.0
2024-02-01 00:00:00+03:00           0.0
2024-02-02 00:00:00+03:00           0.0
2024-02-05 00:00:00+03:00           0.0
2024-02-06 00:00:00+03:00           0.0
2024-02-07 00:00:00+03:00           0.0
2024-02-08 00:00:00+03:00           0.0
```

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2024-02-09 00:00:00+03:00           0.0  ,                         Open   High    Low  Close    Volume  Dividends  \
Date
2023-12-28 00:00:00+03:00  139.9  141.0  139.9  139.9  15850960       0.0
2023-12-29 00:00:00+03:00  139.9  153.8  135.0  153.8  72382161       0.0
2024-01-02 00:00:00+03:00  155.0  169.1  154.6  169.1  34025794       0.0
2024-01-03 00:00:00+03:00  173.5  179.4  161.4  163.5  70903373       0.0
2024-01-04 00:00:00+03:00  164.0  167.3  161.4  161.6  18969438       0.0
2024-01-05 00:00:00+03:00  162.3  162.8  151.2  152.8  21863978       0.0
2024-01-08 00:00:00+03:00  152.8  156.8  148.5  151.5  23067667       0.0
2024-01-09 00:00:00+03:00  152.5  155.1  148.2  149.0  14317207       0.0
2024-01-10 00:00:00+03:00  149.0  149.2  143.9  144.1  12981904       0.0
2024-01-11 00:00:00+03:00  145.0  146.9  140.5  141.1  12203435       0.0
2024-01-12 00:00:00+03:00  140.1  150.3  139.6  145.5  22670274       0.0
2024-01-15 00:00:00+03:00  146.4  147.0  137.8  138.9  18778755       0.0
2024-01-16 00:00:00+03:00  138.9  143.5  134.8  138.6  21782139       0.0
2024-01-17 00:00:00+03:00  137.9  139.5  135.9  135.9   9118291       0.0
2024-01-18 00:00:00+03:00  136.8  139.6  136.1  136.2  10210266       0.0
2024-01-19 00:00:00+03:00  136.9  139.8  136.4  137.6  10194952       0.0
2024-01-22 00:00:00+03:00  137.7  145.4  137.6  141.4  15231965       0.0
2024-01-23 00:00:00+03:00  143.0  143.2  137.6  137.7   8192612       0.0
2024-01-24 00:00:00+03:00  138.1  139.5  136.4  137.8   7431288       0.0
2024-01-25 00:00:00+03:00  138.5  140.6  137.9  139.0   8165830       0.0
2024-01-26 00:00:00+03:00  139.2  152.9  139.0  148.0  29629480       0.0
2024-01-29 00:00:00+03:00  149.0  149.9  145.7  146.0  14086439       0.0
2024-01-30 00:00:00+03:00  146.4  148.8  144.7  145.6   9032525       0.0
2024-01-31 00:00:00+03:00  145.8  146.9  144.8  145.6   8678823       0.0
2024-02-01 00:00:00+03:00  146.1  149.3  145.8  147.4  10777940       0.0
2024-02-02 00:00:00+03:00  147.9  148.7  144.3  144.9   9099290       0.0
2024-02-05 00:00:00+03:00  145.3  146.1  144.3  144.3   6578295       0.0
2024-02-06 00:00:00+03:00  144.6  145.3  142.5  143.0   7727266       0.0
2024-02-07 00:00:00+03:00  143.3  148.0  142.5  143.7  14691492       0.0
2024-02-08 00:00:00+03:00  144.4  158.0  143.6  158.0  31857762       0.0
2024-02-09 00:00:00+03:00  161.4  170.2  161.4  163.6  32624059       0.0

                           Stock Splits
Date
2023-12-28 00:00:00+03:00           0.0
2023-12-29 00:00:00+03:00           0.0
2024-01-02 00:00:00+03:00           0.0
2024-01-03 00:00:00+03:00           0.0
2024-01-04 00:00:00+03:00           0.0
2024-01-05 00:00:00+03:00           0.0
2024-01-08 00:00:00+03:00           0.0
2024-01-09 00:00:00+03:00           0.0
2024-01-10 00:00:00+03:00           0.0
2024-01-11 00:00:00+03:00           0.0
2024-01-12 00:00:00+03:00           0.0
2024-01-15 00:00:00+03:00           0.0
2024-01-16 00:00:00+03:00           0.0
2024-01-17 00:00:00+03:00           0.0
2024-01-18 00:00:00+03:00           0.0
2024-01-19 00:00:00+03:00           0.0
2024-01-22 00:00:00+03:00           0.0
2024-01-23 00:00:00+03:00           0.0
2024-01-24 00:00:00+03:00           0.0
2024-01-25 00:00:00+03:00           0.0
2024-01-26 00:00:00+03:00           0.0
2024-01-29 00:00:00+03:00           0.0
2024-01-30 00:00:00+03:00           0.0
2024-01-31 00:00:00+03:00           0.0
2024-02-01 00:00:00+03:00           0.0
2024-02-02 00:00:00+03:00           0.0
2024-02-05 00:00:00+03:00           0.0
2024-02-06 00:00:00+03:00           0.0
2024-02-07 00:00:00+03:00           0.0
2024-02-08 00:00:00+03:00           0.0
2024-02-09 00:00:00+03:00           0.0  ,                         Open   High    Low  Close   Volume  Dividends  \
Date
2023-12-28 00:00:00+03:00  30.60  31.98  30.60  31.90  1617481       0.0
2023-12-29 00:00:00+03:00  31.90  32.44  31.54  31.92  1942798       0.0
2024-01-02 00:00:00+03:00  32.38  32.90  32.30  32.90  2167449       0.0
2024-01-03 00:00:00+03:00  32.88  34.66  31.70  31.88  2648582       0.0
2024-01-04 00:00:00+03:00  31.86  33.30  31.68  33.20  4012817       0.0
2024-01-05 00:00:00+03:00  33.30  33.40  32.58  33.10  1952404       0.0
2024-01-08 00:00:00+03:00  33.20  33.90  33.14  33.44  2342944       0.0
2024-01-09 00:00:00+03:00  33.58  34.24  32.62  32.62  4913300       0.0
2024-01-10 00:00:00+03:00  32.66  33.02  32.40  32.64  3205280       0.0
2024-01-11 00:00:00+03:00  32.70  33.70  32.68  33.14  4670020       0.0
2024-01-12 00:00:00+03:00  33.10  34.20  32.58  33.86  5300228       0.0
2024-01-15 00:00:00+03:00  34.24  34.78  33.94  34.46  4546751       0.0
2024-01-16 00:00:00+03:00  34.60  34.72  33.98  34.10  3322091       0.0
2024-01-17 00:00:00+03:00  33.98  34.94  33.90  34.38  5429865       0.0
2024-01-18 00:00:00+03:00  34.54  34.66  33.48  33.60  3179052       0.0
2024-01-19 00:00:00+03:00  33.60  34.90  33.26  34.76  5452041       0.0
2024-01-22 00:00:00+03:00  34.74  35.06  34.22  34.24  4712308       0.0
2024-01-23 00:00:00+03:00  34.44  34.66  33.74  33.98  3439594       0.0
2024-01-24 00:00:00+03:00  33.98  35.04  33.56  34.66  7030147       0.0
2024-01-25 00:00:00+03:00  34.98  36.52  34.78  36.14  6765351       0.0
2024-01-26 00:00:00+03:00  36.30  36.64  35.34  36.40  7276485       0.0
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2024-01-29 00:00:00+03:00  36.54  37.00  36.18  36.68  4840607       0.0
2024-01-30 00:00:00+03:00  36.76  37.00  36.00  36.14  4755732       0.0
2024-01-31 00:00:00+03:00  36.18  36.70  36.02  36.34  5009773       0.0
2024-02-01 00:00:00+03:00  36.38  37.68  36.34  37.22  6125185       0.0
2024-02-02 00:00:00+03:00  37.50  38.24  35.80  35.86  7173675       0.0
2024-02-05 00:00:00+03:00  36.08  37.26  35.96  36.70  4802385       0.0
2024-02-06 00:00:00+03:00  36.68  37.20  36.34  37.00  4817252       0.0
2024-02-07 00:00:00+03:00  37.30  38.38  37.16  37.52  7374198       0.0
2024-02-08 00:00:00+03:00  37.80  38.20  37.66  38.20  4726054       0.0
2024-02-09 00:00:00+03:00  38.40  39.44  38.34  39.02  8593095       0.0

                            Stock Splits
Date
2023-12-28 00:00:00+03:00            0.0
2023-12-29 00:00:00+03:00            0.0
2024-01-02 00:00:00+03:00            0.0
2024-01-03 00:00:00+03:00            0.0
2024-01-04 00:00:00+03:00            0.0
2024-01-05 00:00:00+03:00            0.0
2024-01-08 00:00:00+03:00            0.0
2024-01-09 00:00:00+03:00            0.0
2024-01-10 00:00:00+03:00            0.0
2024-01-11 00:00:00+03:00            0.0
2024-01-12 00:00:00+03:00            0.0
2024-01-15 00:00:00+03:00            0.0
2024-01-16 00:00:00+03:00            0.0
2024-01-17 00:00:00+03:00            0.0
2024-01-18 00:00:00+03:00            0.0
2024-01-19 00:00:00+03:00            0.0
2024-01-22 00:00:00+03:00            0.0
2024-01-23 00:00:00+03:00            0.0
2024-01-24 00:00:00+03:00            0.0
2024-01-25 00:00:00+03:00            0.0
2024-01-26 00:00:00+03:00            0.0
2024-01-29 00:00:00+03:00            0.0
2024-01-30 00:00:00+03:00            0.0
2024-01-31 00:00:00+03:00            0.0
2024-02-01 00:00:00+03:00            0.0
2024-02-02 00:00:00+03:00            0.0
2024-02-05 00:00:00+03:00            0.0
2024-02-06 00:00:00+03:00            0.0
2024-02-07 00:00:00+03:00            0.0
2024-02-08 00:00:00+03:00            0.0
2024-02-09 00:00:00+03:00            0.0  ]
Construct Time series...
======================================================================
Ordered Table:
 ----------------------------------------
                         Date  AHGAZ.IS  TUKAS.IS  KOZAL.IS  AKFGY.IS  \
0    2023-12-28 00:00:00+03:00      9.73      6.63     19.57      1.86
1    2023-12-29 00:00:00+03:00     10.24      6.83     19.53      1.97
2    2024-01-02 00:00:00+03:00     10.31      7.10     19.91      1.95
3    2024-01-03 00:00:00+03:00      9.90      6.76     19.22      1.84
4    2024-01-04 00:00:00+03:00     10.15      6.84     19.67      1.86
5    2024-01-05 00:00:00+03:00     10.21      6.94     19.65      1.83
6    2024-01-08 00:00:00+03:00     10.32      7.11     19.78      1.90
7    2024-01-09 00:00:00+03:00     10.04      6.94     19.45      1.86
8    2024-01-10 00:00:00+03:00     10.10      6.94     19.60      1.88
9    2024-01-11 00:00:00+03:00     10.22      6.93     19.91      1.91
10   2024-01-12 00:00:00+03:00     10.36      7.15     20.40      1.89
11   2024-01-15 00:00:00+03:00     10.64      7.09     20.40      1.91
12   2024-01-16 00:00:00+03:00     10.56      7.15     20.34      1.90
13   2024-01-17 00:00:00+03:00     10.72      7.25     20.36      1.89
14   2024-01-18 00:00:00+03:00     11.00      7.41     20.12      1.87
15   2024-01-19 00:00:00+03:00     12.10      7.38     20.20      1.87
16   2024-01-22 00:00:00+03:00     12.18      7.38     20.10      1.91
17   2024-01-23 00:00:00+03:00     12.09      7.31     19.71      1.92
18   2024-01-24 00:00:00+03:00     12.12      7.47     19.93      1.95
19   2024-01-25 00:00:00+03:00     12.29      7.55     20.48      2.04
20   2024-01-26 00:00:00+03:00     12.58      7.66     20.88      2.08
21   2024-01-29 00:00:00+03:00     12.70      7.71     20.94      2.04
22   2024-01-30 00:00:00+03:00     12.79      7.63     20.74      2.02
23   2024-01-31 00:00:00+03:00     12.68      8.39     20.76      2.05
24   2024-02-01 00:00:00+03:00     12.73      8.59     21.20      2.09
25   2024-02-02 00:00:00+03:00     13.30      8.43     21.08      2.16
26   2024-02-05 00:00:00+03:00     13.11      8.52     21.36      2.19
27   2024-02-06 00:00:00+03:00     13.24      8.53     21.24      2.19
28   2024-02-07 00:00:00+03:00     13.31      8.42     21.12      2.24
29   2024-02-08 00:00:00+03:00     13.31      8.75     21.22      2.31
30   2024-02-09 00:00:00+03:00     13.51      8.84     22.14      2.32

     GUBRF.IS  IPEKE.IS
0       139.9     31.90
1       153.8     31.92
2       169.1     32.90
3       163.5     31.88
4       161.6     33.20
5       152.8     33.10
6       151.5     33.44
```

```
7      149.0      32.62
8      144.1      32.64
9      141.1      33.14
10     145.5      33.86
11     138.9      34.46
12     138.6      34.10
13     135.9      34.38
14     136.2      33.60
15     137.6      34.76
16     141.4      34.24
17     137.7      33.98
18     137.8      34.66
19     139.0      36.14
20     148.0      36.40
21     146.0      36.68
22     145.6      36.14
23     145.6      36.34
24     147.4      37.22
25     144.9      35.86
26     144.3      36.70
27     143.0      37.00
28     143.7      37.52
29     158.0      38.20
30     163.6      39.02

 Initial prices:
Symbol
AHGAZ.IS      9.73
TUKAS.IS      6.63
KOZAL.IS     19.57
AKFGY.IS      1.86
GUBRF.IS     139.9
IPEKE.IS      31.9
Name: InitialPrices, dtype: object


 Final prices: Symbol
AHGAZ.IS     13.51
TUKAS.IS      8.84
KOZAL.IS     22.14
AKFGY.IS      2.32
GUBRF.IS     163.6
IPEKE.IS     39.02
Name: FinalPrices, dtype: object

Prices:
 ---------------------------------------
 [[  9.73 10.24 10.31  9.9  10.15 10.21 10.32 10.04 10.1  10.22
   10.36 10.64 10.56 10.72 11.   12.1  12.18 12.09 12.12 12.29
   12.58 12.7  12.79 12.68 12.73 13.3  13.11 13.24 13.31 13.31
   13.51]
 [  6.63  6.83  7.1   6.76  6.84  6.94  7.11  6.94  6.94  6.93
    7.15  7.09  7.15  7.25  7.41  7.38  7.38  7.31  7.47  7.55
    7.66  7.71  7.63  8.39  8.59  8.43  8.52  8.53  8.42  8.75
    8.84]
 [ 19.57 19.53 19.91 19.22 19.67 19.65 19.78 19.45 19.6  19.91
   20.4  20.4  20.34 20.36 20.12 20.2  20.1  19.71 19.93 20.48
   20.88 20.94 20.74 20.76 21.2  21.08 21.36 21.24 21.12 21.22
   22.14]
 [  1.86  1.97  1.95  1.84  1.86  1.83  1.9   1.86  1.88  1.91
    1.89  1.91  1.9   1.89  1.87  1.87  1.91  1.92  1.95  2.04
    2.08  2.04  2.02  2.05  2.09  2.16  2.19  2.19  2.24  2.31
    2.32]
 [139.9 153.8 169.1 163.5 161.6 152.8 151.5 149.  144.1 141.1
  145.5 138.9 138.6 135.9 136.2 137.6 141.4 137.7 137.8 139.
  148.  146.  145.6 145.6 147.4 144.9 144.3 143.  143.7 158.
  163.6 ]
 [ 31.9  31.92 32.9  31.88 33.2  33.1  33.44 32.62 32.64 33.14
   33.86 34.46 34.1  34.38 33.6  34.76 34.24 33.98 34.66 36.14
   36.4  36.68 36.14 36.34 37.22 35.86 36.7  37.   37.52 38.2
   39.02]]
FirstPrices:
 ---------------------------------------
 ['2023-12-28 00:00:00+03:00' 9.73 6.63 19.57 1.86 139.9]
portfolio['Portfolio_Shares']:
 ---------------------------------------
 Symbol
AHGAZ.IS     48279.0
TUKAS.IS     42190.0
KOZAL.IS      8588.0
AKFGY.IS     21828.0
GUBRF.IS       232.0
IPEKE.IS       623.0
Name: Portfolio_Shares, dtype: float64

 prices:
 --------------------
 [[  9.73   6.63  19.57   1.86 139.9   31.9 ]
 [ 10.24   6.83  19.53   1.97 153.8   31.92]
```

```
 [ 10.31   7.1   19.91   1.95 169.1   32.9 ]
 [  9.9    6.76  19.22   1.84 163.5   31.88]
 [ 10.15   6.84  19.67   1.86 161.6   33.2 ]
 [ 10.21   6.94  19.65   1.83 152.8   33.1 ]
 [ 10.32   7.11  19.78   1.9  151.5   33.44]
 [ 10.04   6.94  19.45   1.86 149.    32.62]
 [ 10.1    6.94  19.6    1.88 144.1   32.64]
 [ 10.22   6.93  19.91   1.91 141.1   33.14]
 [ 10.36   7.15  20.4    1.89 145.5   33.86]
 [ 10.64   7.09  20.4    1.91 138.9   34.46]
 [ 10.56   7.15  20.34   1.9  138.6   34.1 ]
 [ 10.72   7.25  20.36   1.89 135.9   34.38]
 [ 11.     7.41  20.12   1.87 136.2   33.6 ]
 [ 12.1    7.38  20.2    1.87 137.6   34.76]
 [ 12.18   7.38  20.1    1.91 141.4   34.24]
 [ 12.09   7.31  19.71   1.92 137.7   33.98]
 [ 12.12   7.47  19.93   1.95 137.8   34.66]
 [ 12.29   7.55  20.48   2.04 139.    36.14]
 [ 12.58   7.66  20.88   2.08 148.    36.4 ]
 [ 12.7    7.71  20.94   2.04 146.    36.68]
 [ 12.79   7.63  20.74   2.02 145.6   36.14]
 [ 12.68   8.39  20.76   2.05 145.6   36.34]
 [ 12.73   8.59  21.2    2.09 147.4   37.22]
 [ 13.3    8.43  21.08   2.16 144.9   35.86]
 [ 13.11   8.52  21.36   2.19 144.3   36.7 ]
 [ 13.24   8.53  21.24   2.19 143.    37.  ]
 [ 13.31   8.42  21.12   2.24 143.7   37.52]
 [ 13.31   8.75  21.22   2.31 158.    38.2 ]
 [ 13.51   8.84  22.14   2.32 163.6   39.02]]

 OrderedTable['PF_Value']:
 ---------------------
 0     1010472.11
 1     1048827.22
 2     1070585.07
 3     1026184.62
 4     1046312.29
 5     1050497.53
 6     1065535.14
 7     1040046.70
 8     1043543.86
 9     1051848.06
 10    1073129.84
 11    1083395.72
 12    1081037.36
 13    1092482.52
 14    1109837.02
 15    1163412.74
 16    1167847.02
 17    1156397.19
 18    1167587.00
 19    1187057.99
 20    1212258.10
 21    1219513.68
 22    1217900.21
 23    1245605.12
 24    1262074.75
 25    1281913.50
 26    1279981.19
 27    1285534.10
 28    1284819.93
 29    1304870.63
 30    1328252.83
Name: PF_Value, dtype: float64
 Residue cash: 317780.71999999974


Average return of the current portfolio is 0.7255130650297559 %

Showing Tearsheet of NEG_SHARPE.csv Portfolio...
=======================================================================
********* PORTFOLIO TEARSHEET ***************
```

Start date	2023-12-29
End date	2024-02-09
Total months	1
	Backtest
Annual return	506.1%
Cumulative returns	23.9%
Annual volatility	20.4%
Sharpe ratio	8.98
Calmar ratio	158.25
Stability	0.94
Max drawdown	-3.2%
Omega ratio	4.48
Sortino ratio	16.70
Skew	-0.68
Kurtosis	2.25
Tail ratio	1.76
Daily value at risk	-1.8%

```
/usr/local/lib/python3.10/dist-packages/pyfolio/plotting.py:805: FutureWarning: The default dtype for empty Series will b
e 'object' instead of 'float64' in a future version. Specify a dtype explicitly to silence this warning.
  oos_cum_returns = pd.Series([])
********* end of TEARSHEET **************
```

Error generating returns tear sheet: 'NoneType' object has no attribute 'savefig'

Cumulative returns
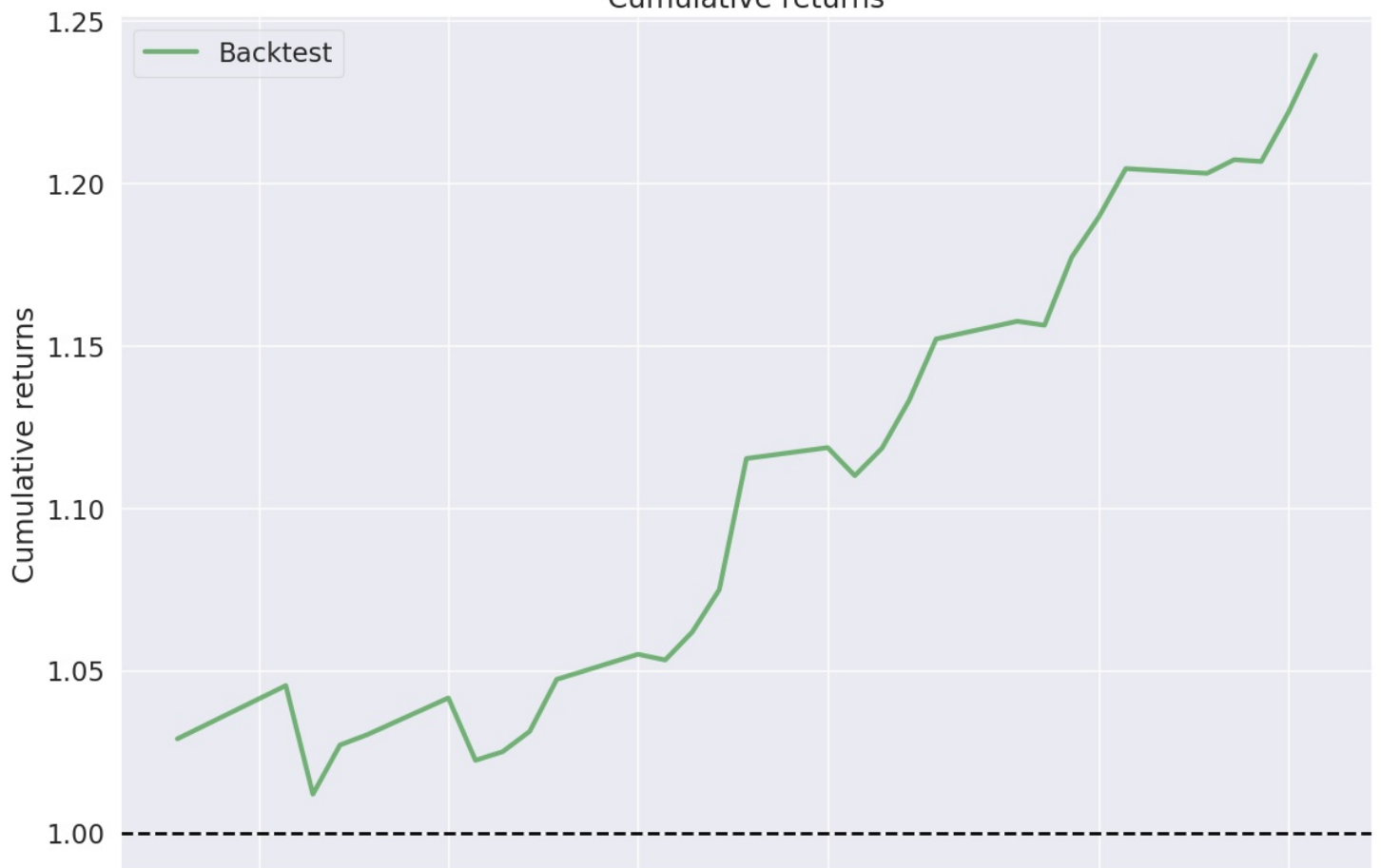
Rolling Sharpe ratio (6-month)
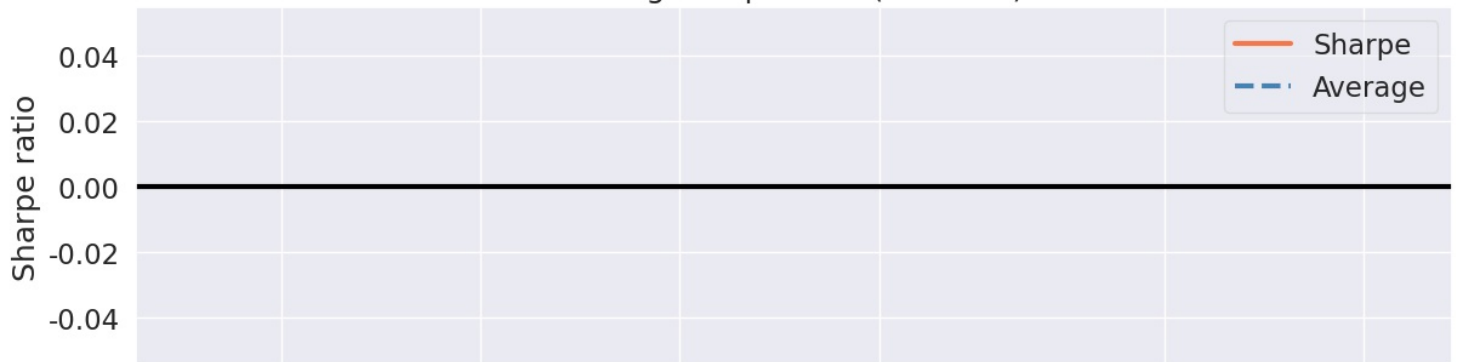
Underwater plot

CURRENT PORTFOLIO PERFORMANCE

```
Annual return          5.060754
Cumulative returns     0.239247
Annual volatility      0.203553
Sharpe ratio           8.981920
Calmar ratio         158.245634
Stability              0.943324
Max drawdown          -0.031980
Omega ratio            4.482514
Sortino ratio         16.697749
Skew                  -0.676100
Kurtosis               2.246864
Tail ratio             1.764438
Daily value at risk   -0.018390
dtype: float64
```

Symbol	Quantity	Purchase Price	Purchased Value	Current Price	Market Value	Start PF %	End PF %	PnL %	Purchase Amount	End Quantity	Portfolio_Weights	InitialPrices
AHGAZ.IS	48279.0	9.62	469754.67	13.51	652249.29	46.49	49.11	39.29	652249.0	48278.0	0.491058	9.73
TUKAS.IS	42190.0	6.30	279719.7	8.84	372959.60	27.68	28.08	35.08	372959.0	42189.0	0.280790	6.63
KOZAL.IS	8588.0	18.99	168067.16	22.14	190138.32	16.63	14.31	13.53	190138.0	8587.0	0.143149	19.57
AKFGY.IS	21828.0	1.75	40600.08	2.32	50640.96	4.02	3.81	26.29	50640.0	21827.0	0.038126	1.86
GUBRF.IS	232.0	172.60	32456.8	163.60	37955.20	3.21	2.86	13.73	37955.0	231.0	0.028575	139.9
IPEKE.IS	623.0	29.82	19873.7	39.02	24309.46	1.97	1.83	23.88	24309.0	622.0	0.018302	31.9

◀ ▶
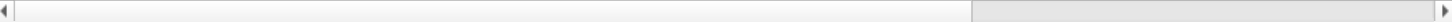
```
['AHGAZ.IS',
 'TUKAS.IS',
 'KOZAL.IS',
 'GUBRF.IS',
 'AKFGY.IS',
 'IPEKE.IS',
 'TRY=X']


****************************************************************
Starting Download of filtered 7 BIST30 assets
****************************************************************
Downloading AHGAZ.IS
Downloading TUKAS.IS
Downloading KOZAL.IS
Downloading GUBRF.IS
Downloading AKFGY.IS
Downloading IPEKE.IS
Downloading TRY=X
****************************************************************
 DOWNLOADED 7 TICKERS from BIST30
****************************************************************

CSV files merged
```

```
tiply
  c *= np.true_divide(1, fact)
/usr/local/lib/python3.10/dist-packages/numpy/lib/function_base.py:518: RuntimeWarning: Mean of empty slice.
  avg = a.mean(axis, **keepdims_kw)
/usr/local/lib/python3.10/dist-packages/numpy/core/_methods.py:182: RuntimeWarning: invalid value encountered in divide
  ret = um.true_divide(
/usr/local/lib/python3.10/dist-packages/pandas/core/frame.py:10474: RuntimeWarning: Degrees of freedom <= 0 for slice
  base_cov = np.cov(mat.T, ddof=ddof)
/usr/local/lib/python3.10/dist-packages/numpy/lib/function_base.py:2704: RuntimeWarning: divide by zero encountered in di
vide
  c *= np.true_divide(1, fact)
/usr/local/lib/python3.10/dist-packages/numpy/lib/function_base.py:2704: RuntimeWarning: invalid value encountered in mul
tiply
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  c *= np.true_divide(1, fact)
/usr/local/lib/python3.10/dist-packages/numpy/lib/function_base.py:518: RuntimeWarning: Mean of empty slice.
  avg = a.mean(axis, **keepdims_kw)
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/usr/local/lib/python3.10/dist-packages/numpy/lib/function_base.py:518: RuntimeWarning: Mean of empty slice.
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/usr/local/lib/python3.10/dist-packages/numpy/core/_methods.py:182: RuntimeWarning: invalid value encountered in divide
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/usr/local/lib/python3.10/dist-packages/pandas/core/frame.py:10474: RuntimeWarning: Degrees of freedom <= 0 for slice
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  c *= np.true_divide(1, fact)
/usr/local/lib/python3.10/dist-packages/numpy/lib/function_base.py:2704: RuntimeWarning: invalid value encountered in mul
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  c *= np.true_divide(1, fact)
/usr/local/lib/python3.10/dist-packages/numpy/lib/function_base.py:518: RuntimeWarning: Mean of empty slice.
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/usr/local/lib/python3.10/dist-packages/numpy/core/_methods.py:182: RuntimeWarning: invalid value encountered in divide
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/usr/local/lib/python3.10/dist-packages/pandas/core/frame.py:10474: RuntimeWarning: Degrees of freedom <= 0 for slice
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/usr/local/lib/python3.10/dist-packages/numpy/lib/function_base.py:2704: RuntimeWarning: divide by zero encountered in di
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  c *= np.true_divide(1, fact)
/usr/local/lib/python3.10/dist-packages/numpy/lib/function_base.py:2704: RuntimeWarning: invalid value encountered in mul
tiply
  c *= np.true_divide(1, fact)
array([0.09405855, 0.19244727, 0.09861237, 0.09381854, 0.32242169,
       0.16553136, 0.03311021])
```

```
{'return': 0.0, 'risk': nan, 'sharpe': nan}
[0.0941 0.1924 0.0986 0.0938 0.3224 0.1655 0.0331]
```

```
/usr/local/lib/python3.10/dist-packages/numpy/lib/function_base.py:518: RuntimeWarning: Mean of empty slice.
  avg = a.mean(axis, **keepdims_kw)
/usr/local/lib/python3.10/dist-packages/numpy/core/_methods.py:182: RuntimeWarning: invalid value encountered in divide
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/usr/local/lib/python3.10/dist-packages/pandas/core/frame.py:10474: RuntimeWarning: Degrees of freedom <= 0 for slice
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/usr/local/lib/python3.10/dist-packages/numpy/lib/function_base.py:2704: RuntimeWarning: invalid value encountered in mul
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/usr/local/lib/python3.10/dist-packages/numpy/lib/function_base.py:518: RuntimeWarning: Mean of empty slice.
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/usr/local/lib/python3.10/dist-packages/numpy/lib/function_base.py:2704: RuntimeWarning: divide by zero encountered in di
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  c *= np.true_divide(1, fact)
/usr/local/lib/python3.10/dist-packages/numpy/lib/function_base.py:518: RuntimeWarning: Mean of empty slice.
  avg = a.mean(axis, **keepdims_kw)
/usr/local/lib/python3.10/dist-packages/numpy/core/_methods.py:182: RuntimeWarning: invalid value encountered in divide
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/usr/local/lib/python3.10/dist-packages/pandas/core/frame.py:10474: RuntimeWarning: Degrees of freedom <= 0 for slice
  base_cov = np.cov(mat.T, ddof=ddof)
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```
% weights of BEST PF
{'return': 0.0, 'risk': nan, 'sharpe': nan}
AKFGY.IS    428228.71
TUKAS.IS    255555.84
IPEKE.IS    219825.84
KOZAL.IS    130965.73
AHGAZ.IS    124988.59
GUBRF.IS    124590.12
TRY=X        43965.17
Name: Amount in 1328252.8299999998 TL, dtype: float64
```

```
/usr/local/lib/python3.10/dist-packages/numpy/lib/function_base.py:518: RuntimeWarning: Mean of empty slice.
  avg = a.mean(axis, **keepdims_kw)
/usr/local/lib/python3.10/dist-packages/numpy/core/_methods.py:182: RuntimeWarning: invalid value encountered in divide
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  c *= np.true_divide(1, fact)
```

```
making operation with  Best_PF_For_bist30.csv
% weights of BEST PF
{'return': 0.0, 'risk': nan, 'sharpe': nan}
assets
ASELS.IS    648984.33
AKBNK.IS    404851.46
TCELL.IS    212520.45
YKBNK.IS     36526.95
FROTO.IS     17931.41
Name: Amount in 1328252.8299999998 TL, dtype: float64
```

```
/usr/local/lib/python3.10/dist-packages/numpy/lib/function_base.py:518: RuntimeWarning: Mean of empty slice.
  avg = a.mean(axis, **keepdims_kw)
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```

	Unnamed: 0	assets	%	Amount	buy_price	shares_to_buy	Portfolio_Weights	InitialPrices	FinalPrices	Portfolio_Amounts	Port
0	16	ASELS.IS	49.51	49510.0	44.18	1120.0	0.4951	41.44	44.18	49510.0	
1	6	AKBNK.IS	26.49	26490.0	38.04	696.0	0.2649	30.62	38.04	26490.0	
2	11	TCELL.IS	18.92	18920.0	53.00	356.0	0.1892	57.94	53.00	18920.0	
3	2	YKBNK.IS	2.42	2420.0	20.06	120.0	0.0242	16.27	20.06	2420.0	
4	21	FROTO.IS	1.87	1870.0	728.00	2.0	0.0187	858.71	728.00	1870.0	
5	4	BIMAS.IS	0.79	790.0	301.00	2.0	0.0079	267.35	301.00	790.0	

```
assets
ASELS.IS    48.86
AKBNK.IS    30.48
TCELL.IS    16.00
YKBNK.IS     2.75
FROTO.IS     1.35
Name: %, dtype: float64
```

% Amount in 1328252.8299999998 TL

assets		
ASELS.IS	48.86	648984.33
AKBNK.IS	30.48	404851.46
TCELL.IS	16.00	212520.45
YKBNK.IS	2.75	36526.95
FROTO.IS	1.35	17931.41

{'AHGAZ': -652249.31, 'TUKAS': -372959.58, 'KOZAL': -190138.33, 'GUBRF': -37955.22, 'AKFGY': -50640.97, 'IPEKE': -24309.42, 'ASELS': 648984.33, 'AKBNK': 404851.46, 'TCELL': 212520.45, 'YKBNK': 36526.95, 'FROTO': 17931.41}
Shopping List for persistent Markowitz portfolio, as for tomorrow:

```
        Buy/Sell
AHGAZ -652249.31
TUKAS -372959.58
KOZAL -190138.33
GUBRF  -37955.22
AKFGY  -50640.97
IPEKE  -24309.42
ASELS  648984.33
AKBNK  404851.46
TCELL  212520.45
YKBNK   36526.95
FROTO   17931.41
   Unnamed: 0   assets      %   Amount  buy_price  shares_to_buy  \
0          16  ASELS.IS  49.51  49510.0      44.18         1120.0
1           6  AKBNK.IS  26.49  26490.0      38.04          696.0
2          11  TCELL.IS  18.92  18920.0      53.00          356.0
3           2  YKBNK.IS   2.42   2420.0      20.06          120.0
4          21  FROTO.IS   1.87   1870.0     728.00            2.0
5           4  BIMAS.IS   0.79    790.0     301.00            2.0

   Portfolio_Weights  InitialPrices  FinalPrices  Portfolio_Amounts  \
0             0.4951          41.44        44.18            49510.0
1             0.2649          30.62        38.04            26490.0
2             0.1892          57.94        53.00            18920.0
3             0.0242          16.27        20.06             2420.0
4             0.0187         858.71       728.00             1870.0
5             0.0079         267.35       301.00              790.0

   Portfolio_Shares  Purchased Value  Market Value  PnL %  Start PF %  \
0              1194         49479.36      52750.92   6.61       49.72
1               865         26486.30      32904.60  24.23       26.62
2               326         18888.44      17278.00  -8.53       18.98
3               148          2407.96       2968.88  23.29        2.42
4                 2          1717.42       1456.00 -15.22        1.73
5                 2           534.70        602.00  12.59        0.54

   End PF %  Final_Cost  Rebalance Buy Price  Rebalance Shares
0     48.86     48860.0                44.18            1120.0
1     30.48     30480.0                38.04             696.0
2     16.00     16000.0                53.00             356.0
3      2.75      2750.0                20.06             120.0
4      1.35      1350.0               728.00               2.0
5      0.56       560.0               301.00               2.0
```

```
Requirement already satisfied: nbconvert in /usr/local/lib/python3.10/dist-packages (6.5.4)
Requirement already satisfied: lxml in /usr/local/lib/python3.10/dist-packages (from nbconvert) (4.9.4)
Requirement already satisfied: beautifulsoup4 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (4.12.3)
Requirement already satisfied: bleach in /usr/local/lib/python3.10/dist-packages (from nbconvert) (6.1.0)
Requirement already satisfied: defusedxml in /usr/local/lib/python3.10/dist-packages (from nbconvert) (0.7.1)
Requirement already satisfied: entrypoints>=0.2.2 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (0.4)
Requirement already satisfied: jinja2>=3.0 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (3.1.3)
Requirement already satisfied: jupyter-core>=4.7 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (5.7.1)
Requirement already satisfied: jupyterlab-pygments in /usr/local/lib/python3.10/dist-packages (from nbconvert) (0.3.0)
Requirement already satisfied: MarkupSafe>=2.0 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (2.1.5)
Requirement already satisfied: mistune<2,>=0.8.1 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (0.8.4)
Requirement already satisfied: nbclient>=0.5.0 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (0.9.0)
Requirement already satisfied: nbformat>=5.1 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (5.9.2)
Requirement already satisfied: packaging in /usr/local/lib/python3.10/dist-packages (from nbconvert) (23.2)
Requirement already satisfied: pandocfilters>=1.4.1 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (1.5.1)
Requirement already satisfied: pygments>=2.4.1 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (2.16.1)
Requirement already satisfied: tinycss2 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (1.2.1)
Requirement already satisfied: traitlets>=5.0 in /usr/local/lib/python3.10/dist-packages (from nbconvert) (5.7.1)
Requirement already satisfied: platformdirs>=2.5 in /usr/local/lib/python3.10/dist-packages (from jupyter-core>=4.7->nbco
nvert) (4.2.0)
Requirement already satisfied: jupyter-client>=6.1.12 in /usr/local/lib/python3.10/dist-packages (from nbclient>=0.5.0->n
bconvert) (6.1.12)
Requirement already satisfied: fastjsonschema in /usr/local/lib/python3.10/dist-packages (from nbformat>=5.1->nbconvert)
(2.19.1)
Requirement already satisfied: jsonschema>=2.6 in /usr/local/lib/python3.10/dist-packages (from nbformat>=5.1->nbconvert)
(4.19.2)
Requirement already satisfied: soupsieve>1.2 in /usr/local/lib/python3.10/dist-packages (from beautifulsoup4->nbconvert)
(2.5)
Requirement already satisfied: six>=1.9.0 in /usr/local/lib/python3.10/dist-packages (from bleach->nbconvert) (1.16.0)
Requirement already satisfied: webencodings in /usr/local/lib/python3.10/dist-packages (from bleach->nbconvert) (0.5.1)
Requirement already satisfied: attrs>=22.2.0 in /usr/local/lib/python3.10/dist-packages (from jsonschema>=2.6->nbformat>=
5.1->nbconvert) (23.2.0)
Requirement already satisfied: jsonschema-specifications>=2023.03.6 in /usr/local/lib/python3.10/dist-packages (from json
schema>=2.6->nbformat>=5.1->nbconvert) (2023.12.1)
Requirement already satisfied: referencing>=0.28.4 in /usr/local/lib/python3.10/dist-packages (from jsonschema>=2.6->nbfo
rmat>=5.1->nbconvert) (0.33.0)
Requirement already satisfied: rpds-py>=0.7.1 in /usr/local/lib/python3.10/dist-packages (from jsonschema>=2.6->nbformat>
=5.1->nbconvert) (0.17.1)
Requirement already satisfied: pyzmq>=13 in /usr/local/lib/python3.10/dist-packages (from jupyter-client>=6.1.12->nbclien
t>=0.5.0->nbconvert) (23.2.1)
Requirement already satisfied: python-dateutil>=2.1 in /usr/local/lib/python3.10/dist-packages (from jupyter-client>=6.1.
12->nbclient>=0.5.0->nbconvert) (2.8.2)
Requirement already satisfied: tornado>=4.1 in /usr/local/lib/python3.10/dist-packages (from jupyter-client>=6.1.12->nbcl
ient>=0.5.0->nbconvert) (6.3.2)

--2024-02-11 21:14:45--  https://raw.githubusercontent.com/MarkovMarkowitz/MarkovMarkowitz/main/ON3_AnalyzeAndReplacePort
folio_v10A.ipynb
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 185.199.108.133, 185.199.109.133, 185.199.110.133, ...
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|185.199.108.133|:443... connected.
HTTP request sent, awaiting response... 404 Not Found
2024-02-11 21:14:45 ERROR 404: Not Found.
```