```
      user_id  Movie1  Movie2  Movie3  Movie4  Movie5  Movie6  Movie7  ...  Movie199  Movie200  Movie201  Movie202  Movie203  Movie204  Movie205  Movie206
0  A3R5OBKS7OM2IR     5.0     5.0     NaN     NaN     NaN     NaN     NaN  ...       NaN       NaN       NaN       NaN       NaN       NaN       NaN       NaN
1  AH3QC2PC1VTGP     NaN     NaN     2.0     NaN     NaN     NaN     NaN  ...       NaN       NaN       NaN       NaN       NaN       NaN       NaN       NaN
2  A3LKP6WPMP9UKX     NaN     NaN     NaN     5.0     NaN     NaN     NaN  ...       NaN       NaN       NaN       NaN       NaN       NaN       NaN       NaN
3  AVIY68KEPQ5ZD     NaN     NaN     NaN     5.0     NaN     NaN     NaN  ...       NaN       NaN       NaN       NaN       NaN       NaN       NaN       NaN
4  A1CV1WROP5KTTW     NaN     NaN     NaN     NaN     5.0     NaN     NaN  ...       NaN       NaN       NaN       NaN       NaN       NaN       NaN       NaN

[5 rows x 207 columns]
(4848, 207)
         count      mean       std  min   25%  50%  75%  max
Movie1     1.0  5.000000       NaN  5.0  5.00  5.0  5.0  5.0
Movie2     1.0  5.000000       NaN  5.0  5.00  5.0  5.0  5.0
Movie3     1.0  2.000000       NaN  2.0  2.00  2.0  2.0  2.0
Movie4     2.0  5.000000  0.000000  5.0  5.00  5.0  5.0  5.0
Movie5    29.0  4.103448  1.496301  1.0  4.00  5.0  5.0  5.0
...        ...       ...       ...  ...   ...  ...  ...  ...
Movie202   6.0  4.333333  1.632993  1.0  5.00  5.0  5.0  5.0
Movie203   1.0  3.000000       NaN  3.0  3.00  3.0  3.0  3.0
Movie204   8.0  4.375000  1.407886  1.0  4.75  5.0  5.0  5.0
Movie205  35.0  4.628571  0.910259  1.0  5.00  5.0  5.0  5.0
Movie206  13.0  4.923077  0.277350  4.0  5.00  5.0  5.0  5.0

[206 rows x 8 columns]

AxesSubplot(0.125,0.11;0.775x0.77)
```

AxesSubplot(0.125,0.11;0.775x0.77)

```
             0
Movie127  9511.0

Movie1      5.000000
Movie2      5.000000
Movie3      2.000000
Movie4      5.000000
Movie5      4.103448
            ...
Movie202    4.333333
Movie203    3.000000
Movie204    4.375000
Movie205    4.628571
Movie206    4.923077
Length: 206, dtype: float64

         0
Movie1   5.0
Movie66  5.0
Movie76  5.0
Movie75  5.0
Movie74  5.0
        count
Movie1      1.0
Movie71     1.0
Movie145    1.0
```

Movie69 1.0

Movie68 1.0

	user_id	Movies	Rating
0	A3R5OBKS7OM2IR	Movie1	5.0
1	AH3QC2PC1VTGP	Movie1	NaN
2	A3LKP6WPMP9UKX	Movie1	NaN
3	AVIY68KEPQ5ZD	Movie1	NaN
4	A1CV1WROP5KTTW	Movie1	NaN
...	...	...	...
998683	A1IMQ9WMFYKWH5	Movie206	5.0
998684	A1KLIKPUF5E88I	Movie206	5.0
998685	A5HG6WFZLO10D	Movie206	5.0
998686	A3UU690TWXCG1X	Movie206	5.0
998687	AI4J762YI6S06	Movie206	5.0

[998688 rows x 3 columns]

<surprise.dataset.DatasetAutoFolds object at 0x000002288AD6C700>

RMSE: 0.2700

0.27002448689984987

MAE: 0.0397

0.03973316257844819

user: AH3QC2PC1VTGP item: Movie206 r_ui = 5.00 est = 0.03 {'was_impossible': False}

user: AH3QC2PC1VTGP item: Movie206 r_ui = 5.00 est = 0.03 {'was_impossible': False}

Evaluating RMSE, MAE of algorithm SVD on 3 split(s).

	Fold 1	Fold 2	Fold 3	Mean	Std
RMSE (testset)	0.2805	0.2827	0.2843	0.2825	0.0016
MAE (testset)	0.0424	0.0427	0.0430	0.0427	0.0002
Fit time	7.84	8.42	10.07	8.78	0.94

Test time 5.25 4.35 4.28 4.62 0.44

{'test_rmse': array([0.28049827, 0.2827043 , 0.28431166]), 'test_mae': array([0.04243642, 0.0427226 , 0.04300876]), 'fit_time': (7.844074249267578, 8.421550273895264, 10.073126077651978), 'test_time': (5.245847225189209, 4.349008560180664, 4.27554988861084)}

Evaluating RMSE, MAE of algorithm SVD on 3 split(s).

	Fold 1	Fold 2	Fold 3	Mean	Std
RMSE (testset)	1.0264	1.0314	1.0298	1.0292	0.0021
MAE (testset)	1.0114	1.0135	1.0127	1.0125	0.0009
Fit time	1.40	1.23	1.26	1.30	0.07
Test time	0.69	0.68	0.88	0.75	0.09

{'test_rmse': array([1.02635173, 1.03141889, 1.02982577]), 'test_mae': array([1.01135655, 1.01345943, 1.01274517]), 'fit_time': (1.399383544921875, 1.2340400218963623, 1.262143611907959), 'test_time': (0.6859517097473145, 0.680030107498169, 0.8840456008911133)}

##########

user: AH3QC2PC1VTGP item: Movie206 r_ui = 5.00 est = 1.00 {'was_impossible': False}

user: AH3QC2PC1VTGP item: Movie206 r_ui = 5.00 est = 1.00 {'was_impossible': False}

##########

d:\LPU\K20EN Sem 4\Xfiles\Summer Training\Simplilearn\Amazon\ProjectCode.py:92: FutureWarning: Dropping of nuisance columns in DataFrame reductions (with 'numeric_only=None') is deprecated; in a future version this will raise TypeError. Select only valid columns before calling the reduction.

repeat(SVD(),movie_data.fillna(movie_data.mean()),-1,10)

Evaluating RMSE, MAE of algorithm SVD on 3 split(s).

	Fold 1	Fold 2	Fold 3	Mean	Std
RMSE (testset)	0.0545	0.0615	0.0549	0.0570	0.0032
MAE (testset)	0.0073	0.0074	0.0080	0.0076	0.0003
Fit time	1.39	1.52	1.33	1.42	0.08
Test time	0.68	0.73	0.96	0.79	0.12

{'test_rmse': array([0.05448975, 0.0614794 , 0.05490765]), 'test_mae': array([0.00726048, 0.00738658, 0.00801842]), 'fit_time': (1.3927199840545654, 1.5244131088256836, 1.3319048881530762), 'test_time': (0.6777677536010742, 0.730487585067749, 0.9646966457366943)}

##########

user: AH3QC2PC1VTGP item: Movie206   r_ui = 5.00   est = 4.54   {'was_impossible': False}

user: AH3QC2PC1VTGP item: Movie206   r_ui = 5.00   est = 4.54   {'was_impossible': False}

##########

d:\LPU\K20EN Sem 4\Xfiles\Summer Training\Simplilearn\Amazon\ProjectCode.py:93: FutureWarning: Dropping of nuisance columns in DataFrame reductions (with 'numeric_only=None') is deprecated; in a future version this will raise TypeError. Select only valid columns before calling the reduction.

  repeat(SVD(),movie_data.fillna(movie_data.median()),-1,10)

Evaluating RMSE, MAE of algorithm SVD on 3 split(s).

	Fold 1	Fold 2	Fold 3	Mean	Std
RMSE (testset)	0.0646	0.0624	0.0599	0.0623	0.0019
MAE (testset)	0.0053	0.0053	0.0050	0.0052	0.0001
Fit time	1.27	1.48	2.07	1.61	0.34
Test time	0.59	1.62	0.81	1.01	0.44

{'test_rmse': array([0.0645657 , 0.06243098, 0.05991487]), 'test_mae': array([0.00525029, 0.00525281, 0.00497536]), 'fit_time': (1.2689979076385498, 1.4767875671386719, 2.0697686672210693), 'test_time': (0.592007160186767 6, 1.6163878440856934, 0.8070666790008545)}

##########

user: AH3QC2PC1VTGP item: Movie206   r_ui = 5.00   est = 4.92   {'was_impossible': False}

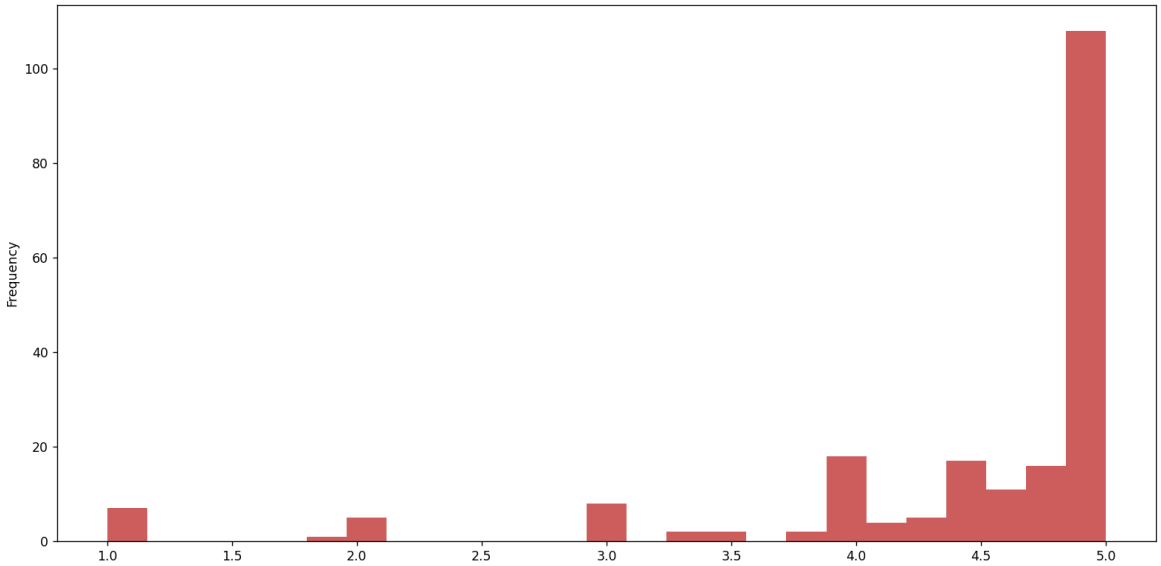
user: AH3QC2PC1VTGP item: Movie206   r_ui = 5.00   est = 4.92   {'was_impossible': False}

##########

{'rmse': 0.2798594644487728, 'mae': 0.04171125066002165}

0.2798594644487728

{'n_epochs': 30, 'lr_all': 0.005, 'n_factors': 100}


Frequency
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20
40
60
80
100
1.0
1.5
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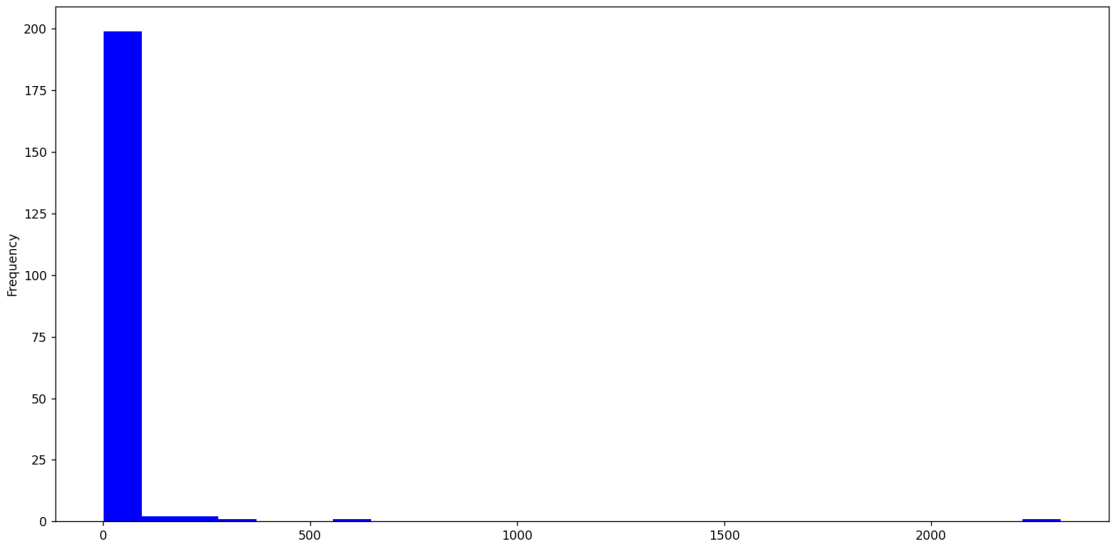
2.5
3.0
3.5
4.0
4.5
5.0


Frequency
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25
50
75
100
125
150
175
200
0
500
1000
1500
2000