LAMPIRAN

Lampiran 1. Harga Gula

	2018	2019	2020	2021	2022	2023	2024
Jan	Rp16.765,22	Rp15.132,61	Rp15.789,13	Rp16.878,57	Rp16.576,19	Rp17.500,00	Rp19.736,96
Feb	Rp16.757,50	Rp14.217,50	Rp16.092,50	Rp16.390,00	Rp16.825,00	Rp17.500,00	Rp19.714,29
Mar	Rp16.600,00	Rp14.511,90	Rp19.511,36	Rp16.523,91	Rp16.652,17	Rp17.500,00	Rp 19.728,57
Apr	Rp16.409,52	Rp14.659,09	Rp20.006,82	Rp16.477,27	Rp18.692,86	Rp17.435,00	Rp 19.888,64
May	Rp16.536,96	Rp14.708,70	Rp20.288,10	Rp16.047,62	Rp18.340,91	Rp17.432,61	
Jun	Rp16.433,33	Rp15.110,00	Rp18.095,45	Rp16.000,00	Rp18.125,00	Rp17.650,00	
Jul	Rp16.250,00	Rp15.426,09	Rp15.745,65	Rp16.090,91	Rp18.000,00	Rp17.650,00	
Aug	Rp16.168,18	Rp15.731,82	Rp15.397,62	Rp16.022,73	Rp18.056,52	Rp17.650,00	
Sep	Rp15.557,50	Rp15.588,10	Rp15.400,00	Rp16.000,00	Rp17.750,00	Rp17.728,57	
Oct	Rp14.932,61	Rp15.152,17	Rp16.190,91	Rp15.842,86	Rp17.688,10	Rp18.129,55	
Nov	Rp14.411,36	Rp15.350,00	Rp16.369,05	Rp16.022,73	Rp17.500,00	Rp18.402,27	
Dec	Rp14.600,00	Rp15.497,73	Rp16.136,96	Rp15.900,00	Rp17.500,00	Rp19.384,78	

Lampiran 2. Output Minitab

1. Statistika Deskritif Harga Gula Pada Setiap Tahun

Descriptive Statistics: 2018; 2019; 2020; 2021; 2022; 2023; 2024

Variable	N	N*	Mean	StDev	Minimum	Maximum
2018	12	0	15952	855	14411	16765
2019	12	0	15090	471	14218	15732
2020	12	0	17085	1860	15398	20288
2021	12	0	16183	312	15843	16879
2022	12	0	17642	672	16576	18693
2023	12	0	17830	571	17433	19385
2024	4	0	19767	81,6	19714	19889

2. Statistika Deskritiv Harga Gula

Descriptive Statistics: Harga

Variable	N	N*	Mean	StDev	Minimum	Maximum
Harga	76	0	16796	1478	14218	20288

Lampiran 3. Transformasi $^{1}/_{Z_t^2}$

no	Transformasi $^{1}/_{Z_t^2}$	no	Transformasi $^{1}/_{Z_t^2}$	no	Transformasi $^{1}/_{Z_t^2}$
1	0,003557801	21	0,004115	41	0,003883
2	0,003561078	22	0,004356	42	0,003906
3	0,003628974	23	0,004244	43	0,003862
4	0,00371371	24	0,004164	44	0,003895
5	0,003656696	25	0,004011	45	0,003906
6	0,003702957	26	0,003861	46	0,003984
7	0,003786982	27	0,002627	47	0,003895
8	0,003825407	28	0,002498	48	0,003956
9	0,00413162	29	0,00243	49	0,003639
10	0,004484651	30	0,003054	50	0,003533
11	0,004814929	31	0,004033	51	0,003606
12	0,004691312	32	0,004218	52	0,002862
13	0,004366891	33	0,004217	53	0,002973
14	0,004947132	34	0,003815	54	0,003044
15	0,004748442	35	0,003732	55	0,003086
16	0,004653566	36	0,00384	56	0,003067
17	0,004622231	37	0,00351	57	0,003174
18	0,004379969	38	0,003723	58	0,003196
19	0,004202314	39	0,003662	59	0,003265
20	0,004040566	40	0,003683	60	0,003265

Lampiran 4. Differencing

no	Differencing	no	Differencing	no	Differencing
1		21	0,00007485	41	0,00019987
2	0,00000328	22	0,00024020	42	0,00002315
3	0,00006790	23	-0,00011154	43	-0,00004401
4	0,00008474	24	-0,00008053	44	0,00003294
5	-0,00005701	25	-0,00015227	45	0,00001107
6	0,00004626	26	-0,00014981	46	0,00007788
7	0,00008403	27	-0,00123469	47	-0,00008895
8	0,00003842	28	-0,00012849	48	0,00006036
9	0,00030621	29	-0,00006879	49	-0,00031613
10	0,00035303	30	0,00062444	50	-0,00010684
11	0,00033028	31	0,00097953	51	0,00007371
12	-0,00012362	32	0,00018440	52	-0,00074441
13	-0,00032442	33	-0,00000130	53	0,00011089
14	0,00058024	34	-0,00040189	54	0,00007125
15	-0,00019869	35	-0,00008258	55	0,00004242
16	-0,00009488	36	0,00010813	56	-0,00001929
17	-0,00003134	37	-0,00033005	57	0,00010685
18	-0,00024226	38	0,00021239	58	0,00002226
19	-0,00017766	39	-0,00006009	59	0,00006908
20	-0,00016175	40	0,00002076	60	0,00000000

Lampiran 5. Syntax SAS

1. Syntax SAS Untuk Model (4,1,4)

```
data insampel;
input y;
datalines;
0.003558
0.003561
0.003629
0.003714
.
.
0.003086
0.003067
0.003174
0.003196
0.003265
0.003265
.
.
.
.
.
;
proc arima data=insampel;
identify var=y(1);
estimate
p=(4) q=(4)
noconstant method=ml;
forecast out=ramalan lead=16;
proc print data=ramalan;
run;
proc univariate data=ramalan normal;
var residual;
run;
```

2. Syntax SAS Untuk Model ([4],1,0)

```
data insampel;
input y;
datalines;
0.003558
0.003561
0.003629
0.003714
.
.
0.002973
0.003044
0.003086
0.003067
0.003174
0.003196
0.003265
0.003265
.
.
.
.
.
;
proc arima data=insampel;
identify var=y(1);
estimate
p=(4)
noconstant method=ml;
forecast out=ramalan lead=16;
proc print data=ramalan;
run;
proc univariate data=ramalan normal;
var residual;
run;
```

3. Syntax SAS Untuk Model (0,1,[4])

```
data insampel;
input y;
datalines;
0.003558
0.003561
0.003629
0.003714
.
.
0.002973
0.003044
0.003086
0.003067
0.003174
0.003196
0.003265
0.003265
.
.
.
.
.
;
proc arima data=insampel;
identify var=y(1);
estimate
q=(4)
noconstant method=ml;
forecast out=ramalan lead=16;
proc print data=ramalan;
run;
proc univariate data=ramalan normal;
var residual;
run;
```

4. Syntaxt SAS Untuk mencari outlier Model ([4],1,0)

```
data insampel;
input y;
datalines;
0.003558
0.003561
0.003629
0.003714
.
.
0.003067
0.003174
0.003196
0.003265
0.003265
.
.
.
;
proc arima data=insampel;
identify var=y(1) ;
run;
estimate
p=4
method=ml noint;
outlier maxnum=5;
run;
forecast lead=16 out=ramalan;
run;
proc print data=ramalan;
run;
proc univariate data= ramalan normal;
    var residual;
    run;
```

5. Syntaxt SAS Untuk mengabungkan outlier Model ([4],1,0)

```
data insampel;
input y x14 x27 x30 x33 x46 x49 x50 x52;
datalines;
0.00355781      0       0       0       0       0       0
        0       0
0.003561078     0       0       0       0       0       0
        0       0
0.003628974     0       0       0       0       0       0
        0       0
0.00371371      0       0       0       0       0       0
        0       0
0.003656696     0       0       0       0       0       0
        0       0
0.003702957     0       0       0       0       0       0
        0       0
.
.
0.00308642      0       0       0       1       1       1
        1       0
0.003067127     0       0       0       1       1       1
        1       0
0.003173973     0       0       0       1       1       1
        1       0
0.003196229     0       0       0       1       1       1
        1       0
0.003265306     0       0       0       1       1       1
        1       0
0.003265306     0       0       0       1       1       1
        1       0
.       0       0       0       1       1       1       1
        0
.       0       0       0       1       1       1       1
        0
```

```
.       0       0       0       1       1       1       1
        0
.       0       0       0       1       1       1       1
        0
.       0       0       0       1       1       1       1
        0
.       0       0       0       1       1       1       1
        0
.       0       0       0       1       1       1       1
        0
.       0       0       0       1       1       1       1
        0

;
proc arima data=insampel;
     identify var=y(1) crosscorr=(x14(1) x27(1) x30(1) x33(1)
x46(1) x49(1) x50(1) x52(1)) ;
     run;
     estimate p=(1,2,4,6) input=(x14 x27 x30 x33 x46 x49 x50
x52) method=ml  noint ;
               forecast lead=16 out=ramalan;
      run;

proc print data=ramalan;
            run;

 proc univariate data= ramalan normal;
     var residual;
     run;

proc autoreg data=ramalan;
     model residual=/archtest noint;
     run;
```

6. Syntaxt SAS Untuk mencari outlier Model (0,1,[4])

```
data insampel;
input y;
datalines;
0.003558
0.003561
0.003629
0.003714
.
.
0.003067
0.003174
0.003196
0.003265
0.003265
.
.
.
;
proc arima data=insampel;
identify var=y(1) ;
run;
estimate
q=4
method=ml noint;
outlier maxnum=5;
run;
forecast lead=16 out=ramalan;
run;
proc print data=ramalan;
run;
proc univariate data= ramalan normal;
    var residual;
    run;
```

7. Syntaxt SAS Untuk mengabungkan outlier Model (0,1,[4])

```
data insampel;
input y x46 x50 x33 x49 x14 x30    x31 x52 x27;
datalines;
0.00355781      0       0       0       0       0       0
        0       0       0
0.003561078     0       0       0       0       0       0
        0       0       0
0.003628974     0       0       0       0       0       0
        0       0       0
0.00371371      0       0       0       0       0       0
        0       0       0
0.003656696     0       0       0       0       0       0
        0       0       0
0.003702957     0       0       0       0       0       0
        0       0       0
.
.
0.00308642      1       1       1       1       0       0
        0       0       0
0.003067127     1       1       1       1       0       0
        0       0       0
0.003173973     1       1       1       1       0       0
        0       0       0
0.003196229     1       1       1       1       0       0
        0       0       0
0.003265306     1       1       1       1       0       0
        0       0       0
0.003265306     1       1       1       1       0       0
        0       0       0
.       1       1       1       1       0       0       0
        0       0
.       1       1       1       1       0       0       0
        0       0
```

```
.       1       1       1       1       0       0       0
        0       0
.       1       1       1       1       0       0       0
        0       0
.       1       1       1       1       0       0       0
        0       0
.       1       1       1       1       0       0       0
        0       0
.       1       1       1       1       0       0       0
        0       0

;


proc arima data=insampel;
    identify var=y(1) crosscorr=(x46(1) x50(1) x33(1) x49(1)
x14(1) x30(1) x31(1) x52(1) x27(1)) ;
    run;
    estimate q=(1, 2, 4) input=(x46 x50 x33 x49 x14 x30 x31 x52
x27) method=ml  noint ;
            forecast lead=16 out=ramalan;
     run;

proc print data=ramalan;
          run;

 proc univariate data= ramalan normal;
    var residual;
    run;

proc autoreg data=ramalan;
    model residual=/archtest noint;
    run;
```

Lampiran 6. Output SAS

1. Output SAS Untuk Model (4,1,4)

Maximum Likelihood Estimation

Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag
MA1,1	0.06271	0.40941	0.15	0.8783	4
AR1,1	-0.26586	0.39198	-0.68	0.4976	4

Variance Estimate	7.96E-8
Std Error Estimate	0.000282
AIC	-794.589
SBC	-790.434
Number of Residuals	59

Correlations of Parameter Estimates

Parameter	MA1,1	AR1,1
MA1,1	1.000	0.946
AR1,1	0.946	1.000

Autocorrelation Check of Residuals

To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	2.46	4	0.6517	0.137	0.016	-0.076	-0.021	-0.069	-0.091
12	3.74	10	0.9584	0.037	0.007	-0.061	0.105	-0.038	-0.008
18	11.55	16	0.7743	-0.226	-0.045	0.005	-0.069	-0.129	-0.144
24	13.10	22	0.9304	-0.066	0.008	0.003	0.086	-0.023	0.060

Tests for Normality

Test		--Statistic---		-----p Value------
Shapiro-Wilk	W	0.848238	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.155513	Pr > D	<0.0100
Cramer-von Mises	W-Sq	0.397739	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	2.383372	Pr > A-Sq	<0.0050

2. Output SAS Untuk Model ([4],1,0)

Maximum Likelihood Estimation

Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag
AR1,1	-0.32121	0.12319	-2.61	0.0091	4

Variance Estimate	7.827E-8
Std Error Estimate	0.00028
AIC	-796.562
SBC	-794.484
Number of Residuals	59

Autocorrelation Check of Residuals

To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	2.46	5	0.7820	0.137	0.017	-0.075	-0.028	-0.065	-0.093
12	3.77	11	0.9762	0.034	-0.010	-0.060	0.109	-0.035	-0.002
18	11.57	17	0.8256	-0.223	-0.045	0.005	-0.071	-0.129	-0.148
24	13.17	23	0.9481	-0.066	0.008	0.005	0.090	-0.024	0.060

Tests for Normality

Test	--Statistic---		-----p Value------	
Shapiro-Wilk	W	0.84956	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.156036	Pr > D	<0.0100
Cramer-von Mises	W-Sq	0.395317	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	2.369074	Pr > A-Sq	<0.0050

3. Output SAS Untuk Model (0,1,[4])

Maximum Likelihood Estimation

Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag
MA1,1	0.31065	0.12636	2.46	0.0140	4

Variance Estimate	7.883E-8
Std Error Estimate	0.000281
AIC	-796.17
SBC	-794.092
Number of Residuals	59

Autocorrelation Check of Residuals

To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	3.03	5	0.6953	0.136	0.017	-0.091	-0.044	-0.095	-0.095
12	4.76	11	0.9423	0.050	0.002	-0.052	0.097	-0.049	-0.010
18	11.85	17	0.8088	-0.225	-0.044	0.009	-0.056	-0.114	-0.135
24	13.27	23	0.9460	-0.065	0.010	-0.009	0.080	-0.022	0.057

Tests for Normality

Test	--Statistic---		-----p Value------	
Shapiro-Wilk	W	0.840686	Pr < W	<0.0001
Kolmogorov-Smirnov	D	0.168996	Pr > D	<0.0100
Cramer-von Mises	W-Sq	0.433327	Pr > W-Sq	<0.0050
Anderson-Darling	A-Sq	2.55813	Pr > A-Sq	<0.0050

4. Output SAS mencari outlier Untuk Model ([4],1,0)

Outlier Details

Obs	Type	Estimate	Chi-Square	Approx Prob> ChiSq
46	Shift	-0.0009435	50.27	<.0001
50	Shift	0.0007832	26.56	<.0001
71	Shift	-0.0007618	32.77	<.0001
33	Shift	0.0006861	32.74	<.0001
49	Shift	0.0004514	13.32	0.0003

5. Output SAS Untuk mencari outlier Model ([4],1,0)

Obs	y	FORECAST	STD	L95	U95	RESIDUAL
1	.003557810	.	.	.	.	.
2	.003561078	.003557810	.000303104	.002963737	.004151883	0.000003268
3	.003628974	.003561078	.000303104	.002967005	.004155151	0.000067896
4	.003713710	.003628974	.000303104	.003034901	.004223047	0.000084736
5	.003656696	.003713710	.000303104	.003119637	.004307783	-.000057014
6	.003702957	.003655625	.000286365	.003094360	.004216890	0.000047332
7	.003786982	.003680706	.000286365	.003119441	.004241971	0.000106276
8	.003825407	.003759212	.000286365	.003197947	.004320477	0.000066195
9	.004131620	.003844092	.000286365	.003282827	.004405356	0.000287528
10	.004484651	.004116459	.000286365	.003555195	.004677724	0.000368192
11	.004814929	.004457114	.000286365	.003895849	.005018379	0.000357815
12	.004691312	.004802336	.000286365	.004241072	.005363601	-.000111024
13	.004366891	.004590960	.000286365	.004029695	.005152225	-.000224069
14	.004947132	.004251196	.000286365	.003689931	.004812460	0.000695936
15	.004748442	.004838893	.000286365	.004277628	.005400158	-.000090451
16	.004653566	.004788954	.000286365	.004227689	.005350219	-.000135388
17	.004622231	.004759885	.000286365	.004198621	.005321150	-.000137654
18	.004379969	.004432074	.000286365	.003870809	.004993339	-.000052105
19	.004202314	.004445084	.000286365	.003883819	.005006349	-.000242770
20	.004040566	.004233407	.000286365	.003672142	.004794672	-.000192841
21	.004115417	.004050835	.000286365	.003489570	.004612100	0.000064582
22	.004355621	.004194811	.000286365	.003633546	.004756076	0.000160810
23	.004244077	.004413842	.000286365	.003852577	.004975107	-.000169765
24	.004163552	.004297085	.000286365	.003735820	.004858350	-.000133533
25	.004011286	.004139022	.000286365	.003577757	.004700287	-.000127736
26	.003861473	.003932566	.000286365	.003371301	.004493831	-.000071093
27	.002626786	.003898028	.000286365	.003336763	.004459293	-.001271242
28	.002498296	.002653176	.000286365	.002091911	.003214440	-.000154880
29	.002429503	.002548197	.000286365	.001986932	.003109461	-.000118694
30	.003053944	.002478600	.000286365	.001917335	.003039865	0.000575344
31	.004033469	.003458576	.000286365	.002897311	.004019841	0.000574893
32	.004217867	.004075578	.000286365	.003514313	.004636843	0.000142289
33	.004216563	.004121094	.000286365	.003559830	.004682359	0.000095469
34	.003814675	.004011921	.000286365	.003450656	.004573186	-.000197246
35	.003732099	.003493665	.000286365	.002932400	.004054929	0.000238434
36	.003840226	.003671668	.000286365	.003110403	.004232933	0.000168558
37	.003510174	.003801551	.000286365	.003240286	.004362815	-.000291377
38	.003722563	.003641881	.000286365	.003080616	.004203146	0.000080682
39	.003662471	.003749625	.000286365	.003188360	.004310890	-.000087154
40	.003683234	.003627036	.000286365	.003065771	.004188300	0.000056198
41	.003883102	.003791399	.000286365	.003230134	.004352664	0.000091703
42	.003906250	.003813498	.000286365	.003252233	.004374763	0.000092752
43	.003862236	.003925943	.000286365	.003364679	.004487208	-.000063707
44	.003895176	.003855432	.000286365	.003294167	.004416696	0.000039744
45	.003906250	.003829675	.000286365	.003268410	.004390940	0.000076575
46	.003984125	.003977211	.000286365	.003415946	.004538476	0.000006914
47	.003895176	.003998549	.000286365	.003437284	.004559814	-.000103373
48	.003955540	.003884381	.000286365	.003323116	.004445646	0.000071159
49	.003639406	.003671863	.000286365	.003110598	.004233128	-.000032457
50	.003532562	.003553663	.000286365	.002992399	.004114928	-.000021101
51	.003606269	.003561712	.000286365	.003000448	.004122977	0.000044557
52	.002861862	.003586486	.000286365	.003025222	.004147751	-.000724624
53	.002972749	.002873688	.000286365	.002312423	.003434953	0.000099061
54	.003043995	.002979592	.000286365	.002418327	.003540857	0.000064403
55	.003086420	.003019840	.000286365	.002458575	.003581105	0.000066580
56	.003067127	.003330377	.000286365	.002769113	.003891642	-.000263250
57	.003173973	.003030787	.000286365	.002469522	.003592052	0.000143186
58	.003196229	.003150624	.000286365	.002589359	.003711889	0.000045605
59	.003265306	.003182325	.000286365	.002621061	.003743590	0.000082981
60	.003265306	.003271629	.000286365	.002710364	.003832894	-.000006323
61	.	.003230290	.000286365	.002669026	.003791555	.
62	.	.003222997	.000404981	.002429248	.004016745	.

6. Output SAS Untuk mencari Model ([1,2,4,6],1,0)

The ARIMA Procedure

Maximum Likelihood Estimation

Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag	Variable	Shift
AR1,1	0.62212	0.13416	4.64	<.0001	1	y	0
AR1,2	-0.54660	0.13301	-4.11	<.0001	2	y	0
AR1,3	-0.15944	0.12446	-1.28	0.2002	4	y	0
AR1,4	-0.15185	0.11889	-1.28	0.2015	6	y	0
NUM1	0.0001411	0.0001625	0.87	0.3852	0	x46	0
NUM2	-0.0003316	0.0001998	-1.66	0.0970	0	x50	0
NUM3	0.0002714	0.0001697	1.60	0.1099	0	x33	0
NUM4	-0.0005049	0.0001936	-2.61	0.0091	0	x49	0
NUM5	0.0004199	0.00009240	4.54	<.0001	0	x14	0
NUM6	-0.0001417	0.00009636	-1.47	0.1414	0	x30	0
NUM7	-0.0004175	0.00009438	-4.42	<.0001	0	x52	0
NUM8	-0.0006280	0.00009414	-6.67	<.0001	0	x27	0

The ARIMA Procedure

Autocorrelation Check of Residuals

To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	2.07	2	0.3559	-0.012	0.048	-0.019	-0.080	0.148	-0.014
12	2.69	8	0.9524	0.017	0.031	-0.005	0.020	-0.080	-0.018
18	10.63	14	0.7146	-0.135	-0.062	-0.059	0.025	-0.204	-0.162
24	18.23	20	0.5719	0.114	-0.087	0.117	-0.152	-0.100	0.107

Tests for Normality

Test	--Statistic---		----p Value------	
Shapiro-Wilk	W	0.958297	Pr < W	0.0415
Kolmogorov-Smirnov	D	0.104661	Pr > D	0.1052
Cramer-von Mises	W-Sq	0.152404	Pr > W-Sq	0.0222
Anderson-Darling	A-Sq	0.902804	Pr > A-Sq	0.0211

2. Output SAS Residual Untuk Model (0,1,[4])

Obs	y	FORECAST	STD	L95	U95	RESIDUAL
1	.003557810	.	.	.	.	.
2	.003561078	.003557810	.000301680	.002966527	.004149093	0.000003268
3	.003628974	.003561078	.000301680	.002969795	.004152361	0.000067896
4	.003713710	.003628974	.000301680	.003037691	.004220257	0.000084736
5	.003656696	.003713710	.000301680	.003122427	.004304993	-.000057014
6	.003702957	.003655759	.000289017	.003089297	.004222221	0.000047198
7	.003786982	.003683492	.000289017	.003117029	.004249954	0.000103490
8	.003825407	.003762689	.000289017	.003196227	.004329151	0.000062718
9	.004131620	.003841753	.000289017	.003275290	.004408215	0.000289867
10	.004484651	.004116877	.000287855	.003552691	.004681063	0.000367774
11	.004814929	.004452324	.000287855	.003888138	.005016510	0.000362605
12	.004691312	.004795338	.000287855	.004231152	.005359524	-.000104026
13	.004366891	.004600767	.000287855	.004036580	.005164953	-.000233876
14	.004947132	.004251081	.000287741	.003687119	.004815043	0.000696051
15	.004748442	.004832950	.000287741	.004268988	.005396912	-.000084508
16	.004653566	.004781199	.000287741	.004217237	.005345161	-.000127633
17	.004622231	.004727212	.000287741	.004163250	.005291174	-.000104981
18	.004379969	.004402874	.000287728	.003838937	.004966811	-.000022905
19	.004202314	.004406601	.000287728	.003842664	.004970538	-.000204287
20	.004040566	.004242537	.000287728	.003678600	.004806474	-.000201971
21	.004115417	.004073650	.000287728	.003509713	.004637587	0.000041767
22	.004355621	.004122636	.000287728	.003558699	.004686573	0.000232985
23	.004244077	.004420007	.000287728	.003856070	.004983944	-.000175930
24	.004163552	.004307733	.000287728	.003743796	.004871670	-.000144181
25	.004011286	.004150388	.000287728	.003586451	.004714325	-.000139102
26	.003861473	.003937856	.000287728	.003373919	.004501793	-.000076383
27	.002626786	.003916921	.000287728	.003352984	.004480858	-.001290135
28	.002498296	.002672228	.000287728	.002108291	.003236165	-.000173932
29	.002429503	.002542137	.000287728	.001978200	.003106074	-.000112634
30	.003053944	.002453577	.000287728	.001889640	.003017514	0.000600367
31	.004033469	.003460559	.000287728	.002896622	.004024496	0.000572910
32	.004217867	.004088287	.000287728	.003524350	.004652224	0.000129580
33	.004216563	.004132636	.000287728	.003568699	.004696573	0.000083927
34	.003814675	.004027344	.000287728	.003463407	.004591281	-.000212669
35	.003732099	.003634110	.000287728	.003070173	.004198047	0.000097989
36	.003840226	.003791259	.000287728	.003227322	.004355196	0.000048967
37	.003510174	.003813774	.000287728	.003249837	.004377711	-.000303600
38	.003722563	.003577201	.000287728	.003013264	.004141138	0.000145362
39	.003662471	.003691679	.000287728	.003127742	.004255616	-.000029208
40	.003683234	.003615521	.000287728	.003051584	.004179458	0.000067713
41	.003883102	.003778920	.000287728	.003214983	.004342857	0.000104182
42	.003906250	.003837288	.000287728	.003273351	.004401225	0.000068962
43	.003862236	.003915456	.000287728	.003351519	.004479393	-.000053220
44	.003895176	.003840895	.000287728	.003276958	.004404832	0.000054281
45	.003906250	.003862341	.000287728	.003298404	.004426278	0.000043909
46	.003984125	.003984125	.000287728	.003420188	.004548062	-2.6661E-11
47	.003895176	.004000898	.000287728	.003436961	.004564835	-.000105722
48	.003955540	.003878068	.000287728	.003314131	.004442005	0.000077472
49	.003639406	.003683586	.000287728	.003119649	.004247523	-.000044180
50	.003532562	.003556797	.000287728	.002992860	.004120734	-.000024235
51	.003606269	.003565883	.000287728	.003001946	.004129820	0.000040386
52	.002861862	.003581852	.000287728	.003017915	.004145789	-.000719990
53	.002972743	.002875786	.000287728	.002311849	.003439723	0.000096963
54	.003043395	.002980387	.000287728	.002416450	.003544324	0.000063608
55	.003086420	.003031266	.000287728	.002467329	.003595203	0.000055154
56	.003067127	.003313341	.000287728	.002749404	.003877278	-.000246214
57	.003173973	.003036567	.000287728	.002472630	.003600504	0.000137406
58	.003196229	.003153926	.000287728	.002589989	.003717863	0.000042303
59	.003265306	.003178846	.000287728	.002614909	.003742783	0.000086460
60	.003265306	.003342906	.000287728	.002778969	.003906843	-.000077600
61	.	.003221999	.000287728	.002658062	.003785936	.
62	.	.003208667	.000406909	.002411139	.004006194	.

3. Output SAS Residual Untuk Model ([1,2],1,0)

The ARIMA Procedure

Maximum Likelihood Estimation

Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag	Variable	Shift
AR1,1	0.62150	0.12496	4.97	<.0001	1	y	0
AR1,2	-0.43674	0.13117	-3.33	0.0009	2	y	0
NUM1	0.0004431	0.00009984	4.44	<.0001	0	x14	0
NUM2	-0.0006000	0.00009904	-6.06	<.0001	0	x27	0
NUM3	0.0003702	0.0001823	2.03	0.0423	0	x33	0
NUM4	-0.0002941	0.0001750	-1.68	0.0929	0	x49	0
NUM5	-0.0004415	0.00009953	-4.44	<.0001	0	x52	0

Autocorrelation Check of Residuals

To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	6.76	4	0.1493	-0.056	0.013	-0.067	-0.229	0.111	-0.172
12	9.91	10	0.4487	0.080	0.049	0.013	0.154	-0.090	-0.047
18	14.31	16	0.5756	-0.057	-0.069	-0.006	0.069	-0.084	-0.178
24	16.64	22	0.7829	0.038	0.006	0.063	-0.066	-0.063	0.098

Tests for Normality

Test		--Statistic---	-----p Value------	
Shapiro-Wilk	W	0.976599	Pr < W	0.3124
Kolmogorov-Smirnov	D	0.093986	Pr > D	>0.1500
Cramer-von Mises	W-Sq	0.077927	Pr > W-Sq	0.2230
Anderson-Darling	A-Sq	0.533483	Pr > A-Sq	0.1724

Forecasts for variable y

Obs	Forecast	Std Error	95% Confidence Limits	
61	0.003235	0.0002203	0.002803	0.003667
62	0.003216	0.0004198	0.002394	0.004039
63	0.003218	0.0005441	0.002152	0.004284
64	0.003227	0.0006116	0.002028	0.004426
65	0.003232	0.0006581	0.001942	0.004522
66	0.003231	0.0007037	0.001852	0.004610
67	0.003228	0.0007534	0.001752	0.004705
68	0.003227	0.0008033	0.001653	0.004802
69	0.003228	0.0008494	0.001563	0.004892
70	0.003228	0.0008914	0.001481	0.004975
71	0.003229	0.0009307	0.001405	0.005053
72	0.003229	0.0009687	0.001330	0.005127
73	0.003228	0.001006	0.001257	0.005200
74	0.003228	0.001042	0.001187	0.005270
75	0.003228	0.001076	0.001119	0.005338
76	0.003228	0.001110	0.001053	0.005403

4. Output SAS Untuk mencari outlier Model (0,1,[4])

Outlier Details

Obs	Type	Estimate	Chi-Square	Approx Prob> ChiSq
46	Shift	-0.0009949	46.67	<.0001
50	Shift	0.0008542	34.40	<.0001
71	Shift	-0.0007257	26.64	<.0001
33	Shift	0.0006425	27.38	<.0001
49	Shift	0.0004907	13.57	0.0002

5. Output SAS Untuk mencari Model ARIMA (0,1,[1,2,4])

Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag	Variable	Shift
MA1,1	-0.51077	0.53483	-0.96	0.3396	1	y	0
MA1,2	0.15370	0.33825	0.45	0.6495	2	y	0
MA1,3	0.33552	0.25615	1.31	0.1902	4	y	0
NUM1	0.0002398	0.0001836	1.31	0.1916	0	x46	0
NUM2	-0.0001305	0.0002188	-0.60	0.5508	0	x50	0
NUM3	-0.0001821	0.0002069	-0.88	0.3811	0	x33	0
NUM4	-0.0004716	0.0002104	-2.24	0.0250	0	x49	0
NUM5	0.0003803	0.00007855	4.84	<.0001	0	x14	0
NUM6	0.0001195	0.0001836	0.65	0.5153	0	x30	0
NUM7	0.0003532	0.0001981	1.78	0.0746	0	x31	0
NUM8	-0.0004488	0.0001123	-4.00	<.0001	0	x52	0
NUM9	-0.0006457	0.0001107	-5.83	<.0001	0	x27	0

Autocorrelation Check of Residuals

To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	5.67	3	0.1287	0.207	-0.042	-0.108	-0.137	-0.111	-0.040
12	6.93	9	0.6447	0.029	0.013	0.075	0.054	0.006	-0.086
18	14.16	15	0.5134	-0.185	-0.139	-0.007	0.007	-0.178	-0.057
24	16.08	21	0.7653	0.055	-0.094	0.054	-0.009	-0.031	0.065

Tests for Normality

Test		--Statistic---		-----p Value------
Shapiro-Wilk	W	0.968997	Pr < W	0.1368
Kolmogorov-Smirnov	D	0.078291	Pr > D	>0.1500
Cramer-von Mises	W-Sq	0.052521	Pr > W-Sq	>0.2500
Anderson-Darling	A-Sq	0.382154	Pr > A-Sq	>0.2500

6. Output SAS Untuk mencari Model ARIMA (0,1,1)

The ARIMA Procedure

Maximum Likelihood Estimation

Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag	Variable	Shift
MA1,1	-0.59664	0.11504	-5.19	<.0001	1	y	0
NUM1	0.0003996	0.00009817	4.07	<.0001	0	x14	0
NUM2	-0.0006213	0.0001028	-6.04	<.0001	0	x27	0
NUM3	0.0002795	0.00009953	2.81	0.0050	0	x31	0
NUM4	-0.0004214	0.00009808	-4.30	<.0001	0	x52	0

Autocorrelation Check of Residuals

To Lag	Chi-Square	DF	Pr > ChiSq	Autocorrelations					
6	5.40	5	0.3695	0.022	-0.020	-0.154	-0.236	-0.047	0.011
12	8.72	11	0.6473	-0.033	0.100	-0.007	0.161	-0.092	-0.010
18	16.98	17	0.4558	-0.142	-0.058	0.092	0.105	-0.180	-0.151
24	23.37	23	0.4391	0.001	-0.090	0.170	0.029	-0.103	0.132

Tests for Normality

Test		--Statistic---		-----p Value------
Shapiro-Wilk	W	0.984324	Pr < W	0.6456
Kolmogorov-Smirnov	D	0.098261	Pr > D	>0.1500
Cramer-von Mises	W-Sq	0.081014	Pr > W-Sq	0.2047
Anderson-Darling	A-Sq	0.444783	Pr > A-Sq	>0.2500

Forecasts for variable y

Obs	Forecast	Std Error	95% Confidence Limits	
61	0.003232	0.0002190	0.002803	0.003662
62	0.003232	0.0004127	0.002424	0.004041
63	0.003232	0.0005409	0.002172	0.004293
64	0.003232	0.0006441	0.001970	0.004495
65	0.003232	0.0007329	0.001796	0.004669
66	0.003232	0.0008121	0.001641	0.004824
67	0.003232	0.0008842	0.001499	0.004965
68	0.003232	0.0009509	0.001369	0.005096
69	0.003232	0.001013	0.001247	0.005218
70	0.003232	0.001072	0.001132	0.005333
71	0.003232	0.001127	0.001023	0.005442
72	0.003232	0.001180	0.00091880	0.005546
73	0.003232	0.001231	0.00081940	0.005645
74	0.003232	0.001280	0.00072393	0.005741
75	0.003232	0.001327	0.00063196	0.005833
76	0.003232	0.001372	0.00054314	0.005922

1. Pemilihan Model terbaik

Untuk model Arima ([1,2],1,0)

Tahun Out-sampel	Zt	Z'_t	Zt-Z'_t	(Zt-Z'_t)^2	Zt-Z'_t/Zt
Jan-23	Rp17.500,00	0,003235	17499,9968	306249886,7750	Rp1,0000
Feb-23	Rp17.500,00	0,003216	17499,9968	306249887,4400	Rp1,0000
Mar-23	Rp17.500,00	0,003218	17499,9968	306249887,3700	Rp1,0000
Apr-23	Rp17.435,00	0,003227	17434,9968	303979112,4745	Rp1,0000
May-23	Rp17.432,61	0,003232	17432,6055	303895733,2514	Rp1,0000
Jun-23	Rp17.650,00	0,003231	17649,9968	311522385,9457	Rp1,0000
Jul-23	Rp17.650,00	0,003228	17649,9968	311522386,0516	Rp1,0000
Aug-23	Rp17.650,00	0,003227	17649,9968	311522386,0869	Rp1,0000
Sep-23	Rp17.728,57	0,003228	17728,5682	314302130,4423	Rp1,0000
Oct-23	Rp18.129,55	0,003228	18129,5422	328680301,3441	Rp1,0000
Nov-23	Rp18.402,27	0,003229	18402,2695	338643522,6871	Rp1,0000
Dec-23	Rp19.384,78	0,003229	19384,7794	375769671,5995	Rp1,0000
Jan-24	Rp19.736,96	0,003228	19736,9533	389547325,3192	Rp1,0000
Feb-24	Rp19.714,29	0,003228	19714,2825	388652933,9491	Rp1,0000
Mar-24	Rp 19.728,57	0,003228	19728,5682	389216403,2446	Rp1,0000
Apr-24	Rp 19.888,64	0,003228	19888,6331	395557728,0039	Rp1,0000
			293031,1793	**5381561681,9849**	**16**
	MSE	MAPE	MAE		
	336347605,1241	15,99999717283	18314,4487064		

Untuk model Arima (0,1,1)

Tahun Out-sampel	Zt	Z´_t	Zt-Z´_t	(Zt-Z´_t)^2	Zt-Z´_t/Zt
Jan-23	Rp17.500,00	0,003232	17499,9968	306249886,8800	Rp1,0000
Feb-23	Rp17.500,00	0,003232	17499,9968	306249886,8800	Rp1,0000
Mar-23	Rp17.500,00	0,003232	17499,9968	306249886,8800	Rp1,0000
Apr-23	Rp17.435,00	0,003232	17434,9968	303979112,3002	Rp1,0000
May-23	Rp17.432,61	0,003232	17432,6055	303895733,2514	Rp1,0000
Jun-23	Rp17.650,00	0,003232	17649,9968	311522385,9104	Rp1,0000
Jul-23	Rp17.650,00	0,003232	17649,9968	311522385,9104	Rp1,0000
Aug-23	Rp17.650,00	0,003232	17649,9968	311522385,9104	Rp1,0000
Sep-23	Rp17.728,57	0,003232	17728,5682	314302130,3005	Rp1,0000
Oct-23	Rp18.129,55	0,003232	18129,5422	328680301,1991	Rp1,0000
Nov-23	Rp18.402,27	0,003232	18402,2695	338643522,5766	Rp1,0000
Dec-23	Rp19.384,78	0,003232	19384,7794	375769671,4832	Rp1,0000
Jan-24	Rp19.736,96	0,003232	19736,9533	389547325,1613	Rp1,0000
Feb-24	Rp19.714,29	0,003232	19714,2825	388652933,7914	Rp1,0000
Mar-24	Rp 19.728,57	0,003232	19728,5682	389216403,0868	Rp1,0000
Apr-24	Rp 19.888,64	0,003232	19888,6331	395557727,8448	Rp1,0000
			293031,1792	**5381561679,3664**	**16**
	MSE	MAPE	MAE		
	336347604,96040	15,9999971689	18314,4487019		

2. Output Sas Hasil prediksi setelah mencari mendapatkan model terbaik

Forecasts for variable y

Obs	Forecast	Std Error	95% Confidence Limits	
61	17620.4452	537.0144	16567.9164	18672.9741
62	17620.4452	1043.0203	15576.1629	19664.7275
63	17620.4452	1373.8262	14927.7953	20313.0951
64	17620.4452	1639.1783	14407.7148	20833.1756
65	17620.4452	1867.1937	13960.8128	21280.0777
66	17620.4452	2070.2462	13562.8372	21678.0533
67	17620.4452	2255.0890	13200.5520	22040.3384
68	17620.4452	2425.8882	12865.7918	22375.0987
69	17620.4452	2585.4285	12553.0985	22687.7919
70	17620.4452	2735.6804	12258.6101	22982.2803
71	17620.4452	2878.0991	11979.4747	23261.4158
72	17620.4452	3013.7952	11713.5152	23527.3752
73	17620.4452	3143.6394	11459.0253	23781.8651
74	17620.4452	3268.3291	11214.6378	24026.2526
75	17620.4452	3388.4336	10979.2374	24261.6531
76	17620.4452	3504.4243	10751.8999	24488.9905

Output Peramalan

Obs	y	FORECAST	STD	L95	U95	RESIDUAL
1	16765	.	.	.	.	.
2	16758	16765.00	644.93	15500.97	18029.03	-7.00
3	16600	16754.77	572.27	15633.14	17876.41	-154.77
4	16410	16509.36	551.01	15429.39	17589.33	-99.36
5	16537	16347.23	542.94	15283.09	17411.38	189.77
6	16433	16660.46	539.59	15602.89	17718.03	-227.46
7	16250	16283.17	538.14	15228.43	17337.91	-33.17
8	16168	16228.04	537.51	15174.53	17281.54	-60.04
9	15558	16128.15	537.23	15075.19	17181.11	-570.15
10	14933	15179.14	537.11	14126.42	16231.86	-246.14
11	14411	14769.37	537.06	13716.75	15821.98	-358.37
12	14600	14172.71	537.03	13120.14	15225.27	427.29
13	15133	14884.15	537.02	13831.60	15936.69	248.85
14	14218	14686.00	537.02	13633.46	15738.53	-468.00
15	14512	14519.26	537.01	13466.73	15571.79	-7.26
16	14659	14507.17	537.01	13454.64	15559.70	151.83
17	14709	14759.97	537.01	13707.44	15812.50	-50.97
18	15110	14675.10	537.01	13622.57	15727.63	434.90
19	15426	15399.23	537.01	14346.70	16451.76	26.77
20	15732	15443.81	537.01	14391.28	16496.33	288.19
21	15588	15923.66	537.01	14871.13	16976.19	-335.66
22	15152	15364.77	537.01	14312.24	16417.30	-212.77
23	15350	15010.50	537.01	13957.97	16063.03	339.50
24	15498	15575.78	537.01	14523.25	16628.31	-77.78
25	15789	15446.27	537.01	14393.74	16498.80	342.73
26	16093	16016.93	537.01	14964.40	17069.46	76.07
27	19511	17945.50	537.01	16892.97	18998.03	1565.50
28	20007	18750.21	537.01	17697.68	19802.74	1256.79
29	20288	20842.82	537.01	19790.29	21895.35	-554.82
30	18095	19919.02	537.01	18866.49	20971.55	-1824.02
31	15746	16433.27	537.01	15380.74	17485.80	-687.27
32	15398	15737.62	537.01	14685.09	16790.14	-339.62
33	15400	15172.14	537.01	14119.61	16224.67	227.86
34	16191	15551.54	537.01	14499.01	16604.06	639.46
35	16369	16616.27	537.01	15563.74	17668.80	-247.27
36	16137	16204.55	537.01	15152.03	17257.08	-67.55
37	16879	16092.07	537.01	15039.54	17144.60	786.93
38	16390	17402.34	537.01	16349.81	18454.87	-1012.34
39	16524	15716.75	537.01	14664.22	16769.28	807.25
40	16477	17060.85	537.01	16008.33	18113.38	-583.85
41	16048	16088.71	537.01	15036.18	17141.24	-40.71
42	16000	16020.92	537.01	14968.40	17073.45	-20.92
43	16091	15986.08	537.01	14933.56	17038.61	104.92
44	16023	16160.77	537.01	15108.24	17213.30	-137.77
45	16000	15931.37	537.01	14878.85	16983.90	68.63
46	15843	16045.64	537.01	14993.11	17098.17	-202.64
47	16023	15708.24	537.01	14655.71	16760.77	314.76
48	15900	16232.33	537.01	15179.80	17284.86	-332.33
49	16576	15678.99	537.01	14626.46	16731.51	897.01
50	16825	17172.55	537.01	16120.02	18225.08	-347.55
51	16652	16593.86	537.01	15541.33	17646.39	58.14
52	18693	17863.84	537.01	16811.31	18916.37	829.16
53	18341	18071.25	537.01	17018.72	19123.77	269.75
54	18125	18520.40	537.01	17467.87	19572.93	-395.40
55	18000	17862.04	537.01	16809.51	18914.57	137.96
56	18057	18091.75	537.01	17039.22	19144.28	-34.75
57	17750	18033.89	537.01	16981.36	19086.42	-283.89
58	17688	17561.20	537.01	16508.67	18613.73	126.80
59	17500	17772.33	537.01	16719.80	18824.86	-272.33
60	17500	17318.89	537.01	16266.36	18371.42	181.11
61	.	17620.45	537.01	16567.92	18672.97	.
62	.	17620.45	1043.02	15576.16	19664.73	.

Obs	y	FORECAST	STD	L95	U95	RESIDUAL
63	.	17620.45	1373.83	14927.80	20313.10	.
64	.	17620.45	1639.18	14407.71	20833.18	.
65	.	17620.45	1867.19	13960.81	21280.08	.
66	.	17620.45	2070.25	13562.84	21678.05	.
67	.	17620.45	2255.09	13200.55	22040.34	.
68	.	17620.45	2425.89	12865.79	22375.10	.
69	.	17620.45	2585.43	12553.10	22687.79	.
70	.	17620.45	2735.68	12258.61	22982.28	.
71	.	17620.45	2878.10	11979.47	23261.42	.
72	.	17620.45	3013.80	11713.52	23527.38	.
73	.	17620.45	3143.64	11459.03	23781.87	.
74	.	17620.45	3268.33	11214.64	24026.25	.
75	.	17620.45	3388.43	10979.24	24261.65	.
76	.	17620.45	3504.42	10751.90	24488.99	.

Lampiran 7. P-value

Formula

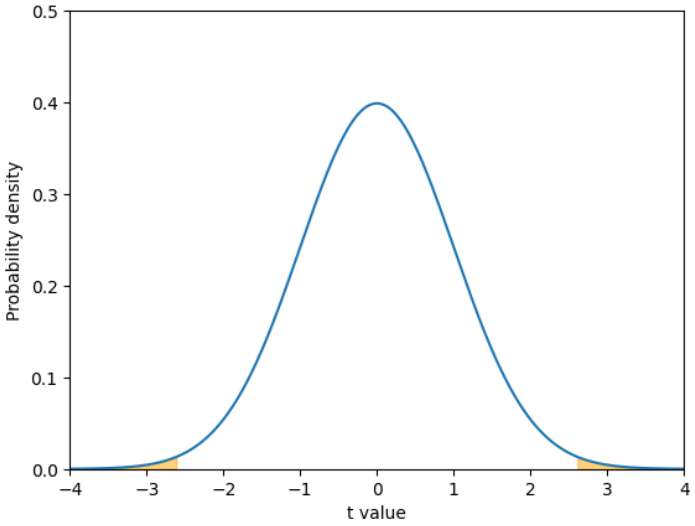
Arima ([4],1,0)

T-test: $t = \frac{\hat{\phi}_p}{SE(\hat{\phi}_p)} = \frac{-0.32121}{0.12319} = -2.61$

P-Value: p = $2P\ (t > |test\ statistic|)$

$2P\ (t > -2.61) = 0.0091$

Visualisasi



Output

Maximum Likelihood Estimation

Parameter	Estimate	Standard Error	t Value	Approx Pr > |t|	Lag
AR1,1	-0.32121	0.12319	-2.61	0.0091	4

PROGRAM STUDI STATISTIKA
SK BAN-PT No. 1765/SK/BAN-PT/AK-PPJ/S/III/2022
FAKULTAS SAINS DAN TEKNOLOGI
UNIVERSITAS PGRI ADI BUANA SURABAYA

FORM F.SK05
BUKTI BIMBINGAN SKRIPSI

Nama Mahasiswa : Salsa Rifqah Nuraini
NIM : 202400006
Judul Skripsi : Prediksi Harga Gula Pasir di Provinsi Papua Barat Menggunakan Metode Arima Box-Jenkins
Dosen Pembimbing : Fenny Fitriani, S.Si,M.Si

	Materi Pembimbingan Proposal	Tanda Tangan Dosen Pembimbing
1.	Revisi Bab 4 (Analisis deskriptif)	
2.	Interpretasi plot time series	
3.	tambahan interpretasi identifikasi stasioner	
4.	tambahan interpretasi estimasi parameter	
5.	bab 4 penambahan plot setelah prediksi	
6.	Interpretasi model setelah model terbik	
7.	Revisi Bab 5	
8.	Revisi template awal bab	

Catatan: *) Coret yang tidak sesuai

PROGRAM STUDI STATISTIKA
SK BAN-PT No. 1765/SK/BAN-PT/AK-PPJ/S/III/2022
FAKULTAS SAINS DAN TEKNOLOGI
UNIVERSITAS PGRI ADI BUANA SURABAYA

FORM F.SK05

BUKTI BIMBINGAN SKRIPSI

Nama Mahasiswa : Salsa Rifqah Nuraini
NIM : 202400006
Judul Skripsi : Prediksi Harga Gula Pasir di Provinsi Papua Barat Menggunakan Metode Arima Box-Jenkins
Dosen Pembimbing : Artanti Indrasetianingsih, S.Si,M.Si

	Materi Pembimbingan Proposal	Tanda Tangan Dosen Pembimbing
1.	menggunakan Analisis Deskriptif,	
2.	interpretasi plot timeseries	
3.	Pembenaran transformasi, Box-Cox	
4.	Cek model ACF dan PACF	
5.	Revisi Estimasi Parameter	
6.	Cek Deteksi outlier	
7.	Pemilihan model terbaik	
8.	Revisi Bab 5	

Catatan: *) Coret yang tidak sesuai

PROGRAM STUDI STATISTIKA
SK BAN-PT No. 1765/SK/BAN-PT/AK-PPJ/S/III/2022
FAKULTAS SAINS DAN TEKNOLOGI
UNIVERSITAS PGRI ADI BUANA SURABAYA

FORM F.SK08

PERBAIKAN/REVISI SEMINAR DAN UJIAN SKRIPSI

Nama Mahasiswa : Salsa Rifqah Nuraini
NIM : 202400006
Judul Skripsi : Prediksi Harga Gula Pasir di Provinsi Papua Barat Menggunakan Metode Arima Box-Jenkins
Pembimbing 1 : Fenny Fitriani, S.Si,M.Si
Pembimbing 2 : Artanti Indrasetianingsih, S.Si,M.Si

Materi Revisi Seminar dan Ujian Skripsi	Tanda Tangan Dosen Penguji
1. Revisi Rumus Bab 2	
2. nama tabel bab 4 dan model	
3. penambahan rumus Bab 2	
4. lampiran	
5.	
6.	

Surabaya,.....

Pembimbing 1

Fenny Fitriani, S.Si,M.Si
NPP. 1503717/DY

Pembimbing 2

Artanti Indrasetianingsih, S.Si., M.Si
NPP. 0609466/DY