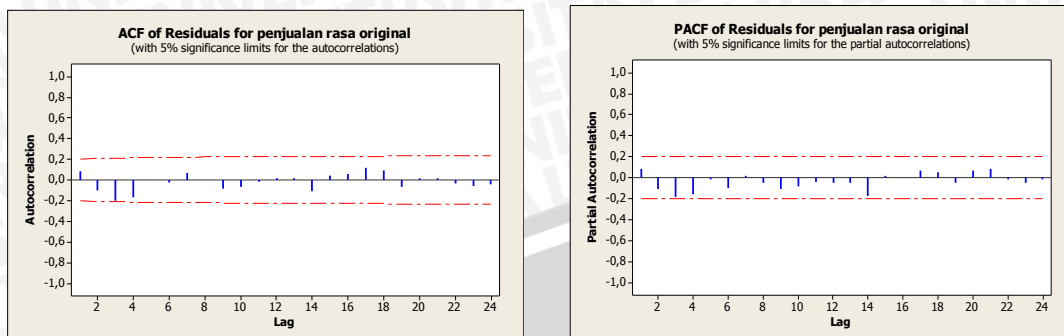


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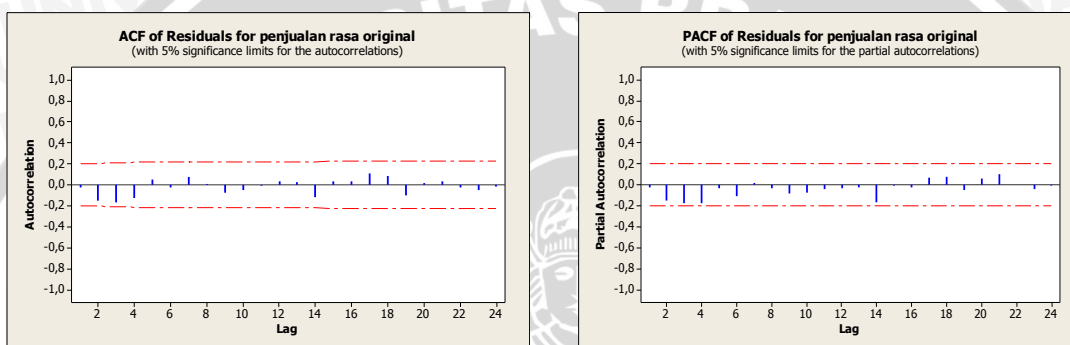
**LAMPIRAN**



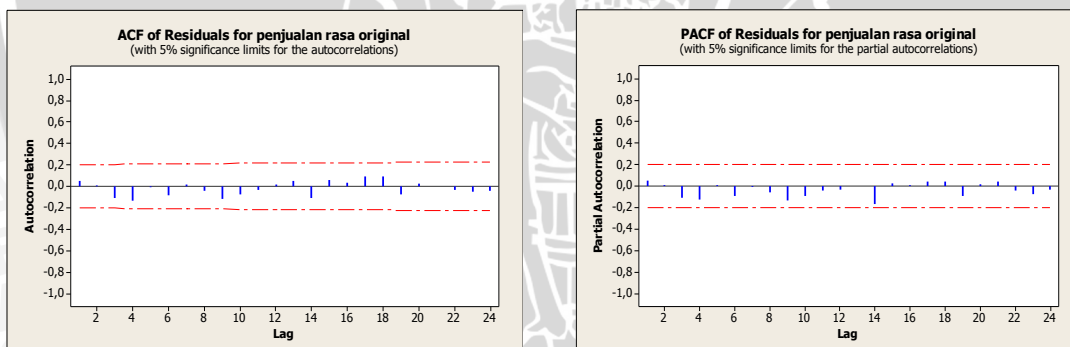
**Lampiran 1. Grafik residual ACF dan PACF penjualan onde-onde original**



Grafik ACF dan PACF Residual Model ARIMA (0,1,1)



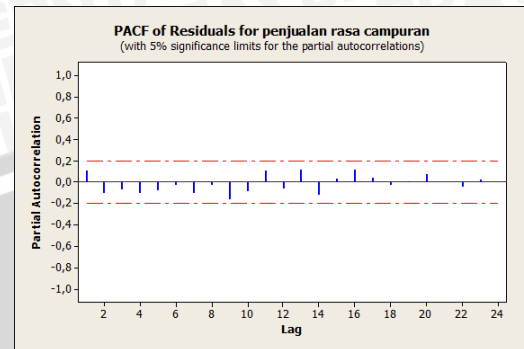
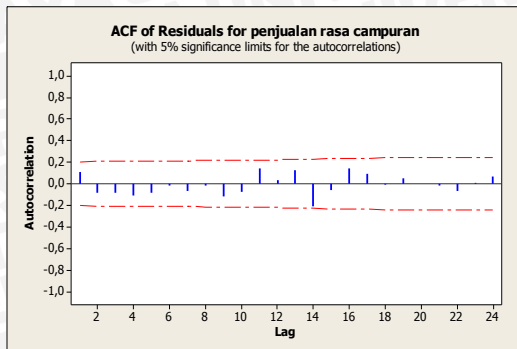
Grafik ACF dan PACF Residual Model ARIMA (1,1,0)



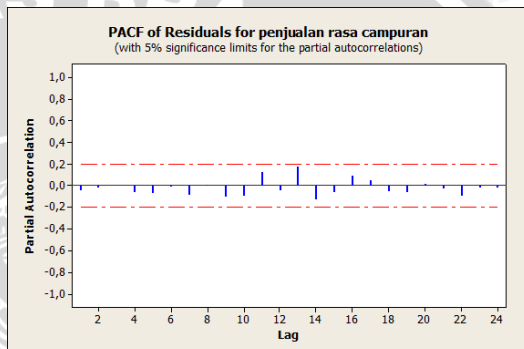
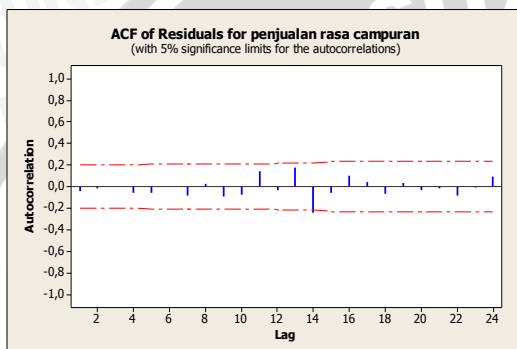
Grafik ACF dan PACF Residual Model ARIMA (1,1,1)

Sumber: Data Output Minitab (2016)

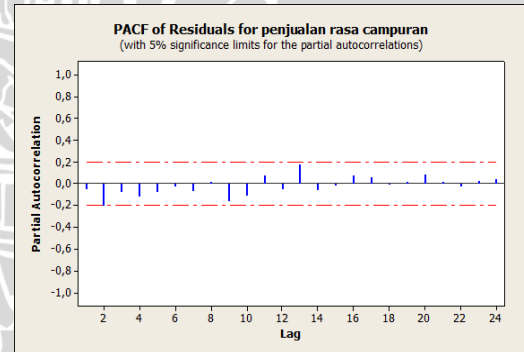
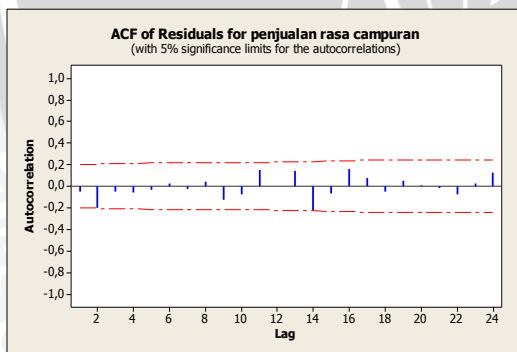
## Lampiran 2. Grafik residual ACF dan PACF penjualan onde-onde berbagai varian rasa



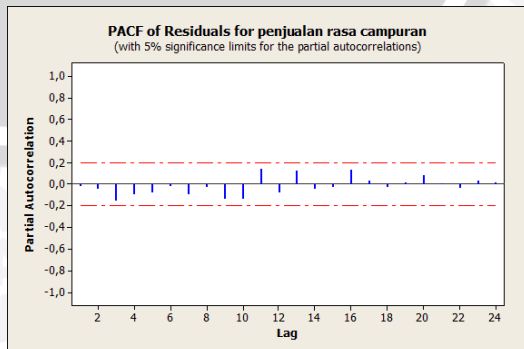
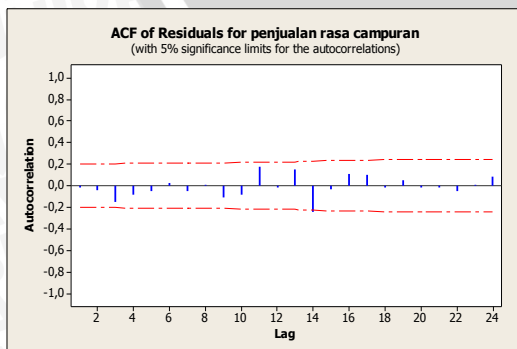
Grafik ACF dan PACF Residual Model ARIMA (0,1,1)



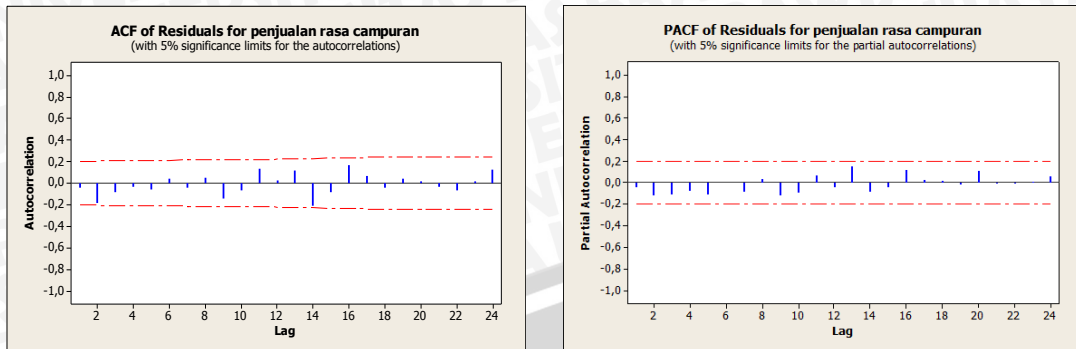
Grafik ACF dan PACF Residual Model ARIMA (1,1,1)



Grafik ACF dan PACF Residual Model ARIMA (1,1,0)



Grafik ACF dan PACF Residual Model ARIMA (2,1,0)



Gambar Grafik ACF dan PACF Residual Model ARIMA (2,1,1)

Sumber: Data Output Minitab (2016)

### Lampiran 3. Model sementara peramalan penjualan onde-onde rasa original ARIMA Model: (0,1,1)

Estimates at each iteration

Iteration	SSE	Parameters
0	19495185	0,100 2,205
1	18848524	0,250 0,068
2	18708505	0,320 -0,565
3	18669848	0,355 -0,908
4	18656679	0,375 -1,107
5	18651701	0,387 -1,230
6	18649707	0,395 -1,307
7	18648880	0,399 -1,357
8	18648531	0,403 -1,390
9	18648381	0,405 -1,411
10	18648317	0,406 -1,425
11	18648289	0,407 -1,435
12	18648277	0,408 -1,441
13	18648272	0,408 -1,445
14	18648269	0,408 -1,448
15	18648268	0,408 -1,449
16	18648268	0,408 -1,451

Relative change in each estimate less than 0,0010

Final Estimates of Parameters

Type	Coef	SE Coef	T	P
MA 1	0,4084	0,0994	4,11	0,000
Constant	-1,45	27,24	-0,05	0,098

Differencing: 1 regular difference

Number of observations: Original series 96, after differencing 95

Residuals: SS = 18642872 (backforecasts excluded)  
MS = 200461 DF = 93

### Lampiran 3. (Lanjutan)

Modified Box-Pierce (Ljung-Box) Chi-Square statistic

Lag	12	24	36	48
Chi-Square	10,5	16,6	24,4	32,9
DF	10	22	34	46
P-Value	0,021	0,046	0,028	0,027

### ARIMA Model: (1,1,1)

Estimates at each iteration

Iteration	SSE	Parameters			
0	20259580	0,100	0,100	1,985	
1	18905439	-0,019	0,220	-0,086	
2	18645863	0,119	0,370	-0,560	
3	18300730	0,256	0,520	-1,102	
4	17840481	0,389	0,670	-1,701	
5	17183055	0,514	0,820	-2,308	
6	16132671	0,608	0,970	-2,673	
7	15555659	0,488	0,987	-0,992	
8	15448200	0,449	0,986	-2,187	
9	15421826	0,439	0,989	-1,999	
10	15420756	0,435	0,989	-2,112	
11	15404463	0,430	0,990	-2,105	
12	15395970	0,426	0,991	-2,183	
13	15354619	0,416	0,995	-2,235	
14	15234628	0,413	1,004	-2,342	
15	15214905	0,413	1,005	-2,359	
16	15199122	0,414	1,006	-2,371	
17	15186600	0,414	1,006	-2,379	
18	15176379	0,414	1,007	-2,383	
19	15167739	0,414	1,007	-2,386	
20	15160211	0,414	1,007	-2,388	

Relative change in each estimate less than 0,0010

Final Estimates of Parameters

Type	Coef	SE Coef	T	P
AR 1	0,4142	0,0969	4,28	0,000
MA 1	1,0075	0,0029	343,23	0,000
Constant	-2,3881	0,8437	-2,83	0,006

Differencing: 1 regular difference

Number of observations: Original series 96, after differencing 95

Residuals: SS = 14856238 (backforecasts excluded)  
MS = 161481 DF = 92

Modified Box-Pierce (Ljung-Box) Chi-Square statistic

Lag	12	24	36	48
Chi-Square	6,0	11,6	18,0	26,4
DF	9	21	33	45
P-Value	0,000	0,000	0,000	0,000

### Lampiran 3. (Lanjutan)

#### ARIMA Model: (1,1,0)

Estimates at each iteration

Iteration	SSE	Parameters	
0	21383417	0,100	1,985
1	19845812	-0,050	1,239
2	19196737	-0,200	0,962
3	19173195	-0,233	1,194
4	19173131	-0,234	1,241
5	19173130	-0,235	1,246
6	19173130	-0,235	1,246

Relative change in each estimate less than 0,0010

Final Estimates of Parameters

Type	Coef	SE Coef	T	P
AR 1	-0,2346	0,1021	-2,30	0,024
Constant	1,25	46,59	0,03	0,027

Differencing: 1 regular difference

Number of observations: Original series 96, after differencing 95

Residuals: SS = 19171945 (backforecasts excluded)

MS = 206150 DF = 93

Modified Box-Pierce (Ljung-Box) Chi-Square statistic

Lag	12	24	36	48
Chi-Square	8,6	14,5	21,8	29,5
DF	10	22	34	46
P-Value	0,000	0,001	0,001	0,001

### Lampiran 4. Model sementara peramalan penjualan onde-onde berbagai varian rasa

#### ARIMA Model: (0,1,1)

Estimates at each iteration

Iteration	SSE	Parameters	
0	27389366	0,100	8,521
1	26002523	0,250	6,984
2	25317877	0,381	6,834
3	25144810	0,443	6,989
4	25092406	0,476	7,018
5	25074343	0,495	7,023
6	25067586	0,507	7,019
7	25064928	0,514	7,015
8	25063849	0,518	7,011
9	25063403	0,521	7,008
10	25063217	0,523	7,006
11	25063139	0,524	7,004
12	25063107	0,525	7,003
13	25063094	0,526	7,002

Relative change in each estimate less than 0,0010

#### Lampiran 4. (Lanjutan)

Final Estimates of Parameters

Type		Coef	SE Coef	T	P
MA	1	0,5256	0,0933	5,63	0,000
Constant		7,00	25,28	0,28	0,027

Differencing: 1 regular difference

Number of observations: Original series 96, after differencing 95

Residuals: SS = 24814484 (backforecasts excluded)  
MS = 266822 DF = 93

Modified Box-Pierce (Ljung-Box) Chi-Square statistic

Lag	12	24	36	48
Chi-Square	9,6	21,8	35,0	59,5
DF	10	22	34	46
P-Value	0,028	0,033	0,029	0,003

#### ARIMA Model: (1,1,1)

Estimates at each iteration

Iteration	SSE	Parameters			
0	28748264	0,100	0,100	7,669	
1	25901303	-0,040	0,240	5,797	
2	25453913	0,089	0,390	5,008	
3	24940218	0,213	0,540	4,030	
4	24299532	0,332	0,690	2,882	
5	23408459	0,442	0,840	1,591	
6	22110300	0,528	0,990	0,159	
7	21800517	0,480	0,994	1,234	
8	21783845	0,470	0,994	1,683	

Unable to reduce sum of squares any further

Final Estimates of Parameters

Type		Coef	SE Coef	T	P
AR	1	0,4697	0,1025	4,58	0,000
MA	1	0,9937	0,0158	63,01	0,000
Constant		1,683	1,874	0,90	0,037

Differencing: 1 regular difference

Number of observations: Original series 96, after differencing 95

Residuals: SS = 20923318 (backforecasts excluded)  
MS = 227427 DF = 92

Modified Box-Pierce (Ljung-Box) Chi-Square statistic

Lag	12	24	36	48
Chi-Square	5,6	20,4	33,5	54,1
DF	9	21	33	45
P-Value	0,033	0,013	0,018	0,015

**Lampiran 4. (Lanjutan)****ARIMA Model: (1,1,0)**

Estimates at each iteration

Iteration	SSE	Parameters	
0	30585559	0,100	7,669
1	28035261	-0,050	7,225
2	26717073	-0,200	8,430
3	26518823	-0,277	10,359
4	26516784	-0,285	10,937
5	26516762	-0,285	11,016
6	26516762	-0,285	11,026

Relative change in each estimate less than 0,0010

Final Estimates of Parameters

Type	Coef	SE Coef	T	P
AR 1	-0,2854	0,1005	-2,84	0,006
Constant	11,03	54,73	0,20	0,084

Differencing: 1 regular difference

Number of observations: Original series 96, after differencing 95

Residuals: SS = 26461591 (backforecasts excluded)

MS = 284533 DF = 93

Modified Box-Pierce (Ljung-Box) Chi-Square statistic

Lag	12	24	36	48
Chi-Square	10,1	25,9	40,3	64,1
DF	10	22	34	46
P-Value	0,007	0,001	0,000	0,000

**ARIMA Model: (2,1,0)**

Estimates at each iteration

Iteration	SSE	Parameters		
0	31213258	0,100	0,100	6,817
1	28044011	-0,050	0,001	4,454
2	26101625	-0,200	-0,101	6,382
3	25429668	-0,333	-0,196	10,958
4	25416602	-0,351	-0,211	12,517
5	25416343	-0,353	-0,214	12,791
6	25416338	-0,353	-0,214	12,835
7	25416338	-0,353	-0,214	12,841

Relative change in each estimate less than 0,0010

Final Estimates of Parameters

Type	Coef	SE Coef	T	P
AR 1	-0,3532	0,1037	-3,41	0,001
AR 2	-0,2140	0,1046	-2,05	0,044
Constant	12,84	53,78	0,24	0,040

Differencing: 1 regular difference

Number of observations: Original series 96, after differencing 95

Residuals: SS = 25265936 (backforecasts excluded)

MS = 274630 DF = 92



**Lampiran 4. (Lanjutan)**

Modified Box-Pierce (Ljung-Box) Chi-Square statistic

Lag	12	24	36	48
Chi-Square	15,1	28,0	40,4	56,6
DF	9	21	33	45
P-Value	0,034	0,007	0,009	0,002

**ARIMA Model: (2,1,1)**

Estimates at each iteration

Iteration	SSE	Parameters			
0	29540148	0,100	0,100	0,100	6,817
1	28620854	-0,050	0,064	-0,007	6,818
2	28152920	-0,200	0,035	-0,132	7,454
3	27855274	-0,350	0,008	-0,265	8,297
4	27652800	-0,500	-0,018	-0,403	9,248
5	27510548	-0,650	-0,043	-0,544	10,259
6	27402443	-0,800	-0,067	-0,687	11,317
7	27297149	-0,950	-0,095	-0,827	12,481
8	26995300	-1,100	-0,145	-0,947	14,277
9	26432451	-1,219	-0,258	-0,968	19,614
10	26357812	-1,258	-0,304	-0,961	20,424
11	26326697	-1,249	-0,312	-0,944	21,088
12	26304907	-1,236	-0,307	-0,940	21,192
13	26300650	-1,231	-0,306	-0,939	21,049
14	26300079	-1,230	-0,305	-0,938	20,980

Unable to reduce sum of squares any further

Final Estimates of Parameters

Type	Coef	SE Coef	T	P
AR 1	-1,2302	0,1118	-11,01	0,000
AR 2	-0,3053	0,1013	-3,01	0,003
MA 1	-0,9385	0,0502	-18,71	0,000
Constant	21,0	106,8	0,20	0,039

Differencing: 1 regular difference

Number of observations: Original series 96, after differencing 95

Residuals: SS = 26221557 (backforecasts excluded)  
MS = 288149 DF = 91

Modified Box-Pierce (Ljung-Box) Chi-Square statistic

Lag	12	24	36	48
Chi-Square	10,4	30,6	54,2	52,9
DF	8	20	32	44
P-Value	0,024	0,061	0,061	0,008

## Lampiran 5. Hasil peramalan

### a. Hasil peramalan penjualan onde-onde rasa original model ARIMA (1,1,1)

Forecasts from period 96

Period	Forecast	95% Limits		Actual
		Lower	Upper	
97	4280	3704	5280	
98	4200	3346	5047	
99	4000	3212	4931	
100	4000	3156	4879	
101	3950	3132	4854	
102	3980	3119	4841	
103	3970	3111	4834	
104	3970	3106	4828	
105	3965	3101	4824	
106	3960	3097	4819	
107	3955	3092	4815	
108	3950	3088	4811	
109	3950	3084	4807	
110	3940	3080	4803	
111	3940	3076	4799	
112	3930	3072	4795	
113	3930	3067	4791	
114	3925	3063	4787	
115	3920	3059	4783	
116	3920	3055	4779	
117	3915	3051	4775	
118	3910	3047	4771	
119	3905	3043	4767	
120	3900	3038	4763	
121	3900	3034	4759	
122	3890	3030	4755	
123	3900	3026	4751	
124	3885	3022	4747	
125	3875	3018	4743	
126	3875	3014	4739	
127	3850	3009	4735	
128	3850	3005	4731	
129	3870	3001	4727	
130	3865	2997	4723	
131	3860	2993	4719	
132	3860	2989	4715	
133	3855	2985	4711	
134	3850	2981	4707	
135	3845	2976	4703	
136	3840	2972	4699	
137	3835	2968	4695	
138	3835	2964	4691	
139	3830	2960	4687	
140	3830	2956	4682	
141	3820	2952	4678	
142	3815	2947	4674	
143	3815	2943	4670	
144	3810	2939	4666	
145	3810	2935	4662	
146	3805	2931	4658	
147	3805	2927	4654	
148	3800	2923	4650	
149	3800	2919	4646	
150	3800	2914	4642	
151	3785	2910	4638	
152	3785	2906	4634	
153	3785	2902	4630	
154	3785	2898	4626	

### Lampiran 5. (Lanjutan)

155	3770	2894	4622
156	3770	2890	4618
157	3770	2885	4614
158	3800	2881	4610
159	3800	2877	4606
160	3800	2873	4602
161	3800	2869	4598
162	4000	2865	4594
163	4000	2861	4590
164	4000	2856	4586
165	3900	2852	4582
166	3900	2848	4578
167	3850	2844	4574
168	3850	2840	4570
169	3800	2836	4566
170	3800	2832	4562
171	3800	2828	4558
172	3800	2823	4554
173	3800	2819	4550
174	3950	2815	4546
175	3940	2811	4542
176	3940	2807	4538
177	3930	2803	4534
178	3930	2799	4530
179	3925	2794	4526
180	3920	2790	4522
181	3920	2786	4518
182	3800	2782	4514
183	3800	2778	4510
184	3800	2774	4506
185	3800	2770	4502
186	3700	2766	4498
187	3810	2761	4494
188	3810	2757	4490
189	3805	2753	4486
190	3805	2749	4482
191	4000	2745	4478
192	4000	2741	4474

### b. Hasil peramalan penjualan onde-onde rasa campuran model ARIMA

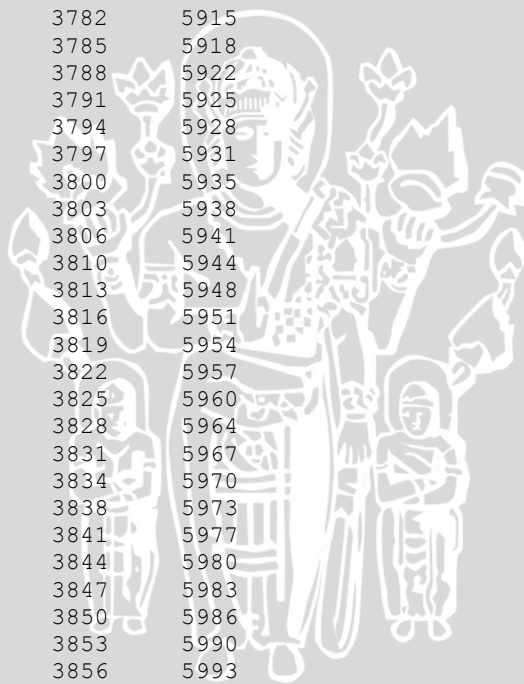
(1,1,1)

Forecasts from period 96

Period	Forecast	95% Limits		Actual
		Lower	Upper	
97	4700	4534	6404	
98	4500	4045	6116	
99	4500	3843	5958	
100	4550	3754	5880	
101	4500	3715	5844	
102	4600	3699	5828	
103	4600	3693	5823	
104	4650	3692	5822	
105	4640	3693	5823	
106	4620	3695	5826	
107	4600	3698	5828	
108	4575	3701	5831	
109	4570	3704	5835	
110	4500	3707	5838	
111	4550	3710	5841	
112	4580	3713	5844	

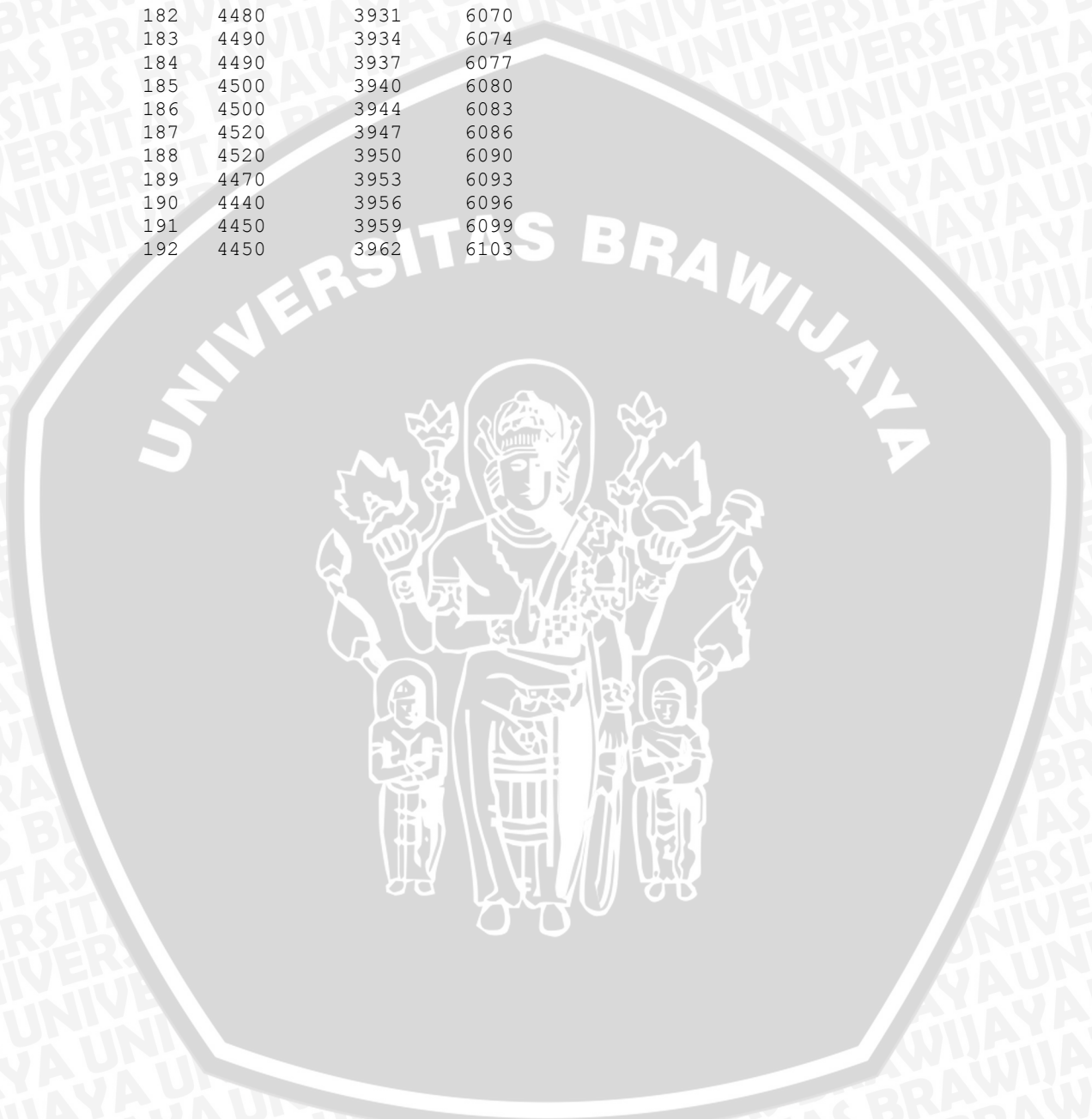
## Lampiran 5. (Lanjutan)

113	4580	3716	5847
114	4540	3718	5851
115	4500	3722	5854
116	4500	3725	5857
117	4460	3729	5860
118	4460	3732	5864
119	4400	3735	5867
120	4400	3738	5870
121	4350	3741	5873
122	4420	3744	5876
123	4400	3747	5880
124	4450	3750	5883
125	4450	3753	5886
126	4400	3757	5889
127	4380	3760	5893
128	4370	3763	5896
129	4350	3766	5899
130	4350	3769	5902
131	4330	3772	5906
132	4330	3775	5909
133	4300	3778	5912
134	4300	3782	5915
135	4270	3785	5918
136	4250	3788	5922
137	4250	3791	5925
138	4280	3794	5928
139	4280	3797	5931
140	4250	3800	5935
141	4250	3803	5938
142	4260	3806	5941
143	4260	3810	5944
144	4300	3813	5948
145	4300	3816	5951
146	4290	3819	5954
147	4290	3822	5957
148	4250	3825	5960
149	4250	3828	5964
150	4245	3831	5967
151	4220	3834	5970
152	4220	3838	5973
153	4225	3841	5977
154	4230	3844	5980
155	4230	3847	5983
156	4240	3850	5986
157	4240	3853	5990
158	4240	3856	5993
159	4210	3859	5996
160	4210	3863	5999
161	4100	3866	6002
162	4100	3869	6006
163	4080	3872	6009
164	4070	3875	6012
165	4070	3878	6015
166	4060	3881	6019
167	4070	3884	6022
168	4075	3887	6025
169	4070	3891	6028
170	4070	3894	6032
171	4100	3897	6035
172	4150	3900	6038
173	4200	3903	6041
174	4200	3906	6044
175	4250	3909	6048



**Lampiran 5. (Lanjutan)**

176	4250	3912	6051
177	4300	3916	6054
178	4350	3919	6057
179	4350	3922	6061
180	4400	3925	6064
181	4400	3928	6067
182	4480	3931	6070
183	4490	3934	6074
184	4490	3937	6077
185	4500	3940	6080
186	4500	3944	6083
187	4520	3947	6086
188	4520	3950	6090
189	4470	3953	6093
190	4440	3956	6096
191	4450	3959	6099
192	4450	3962	6103



Lampiran 6. Dokumentasi



Toko Bo Liem tampak depan



Proses pengorengan onde-onde



Proses pembuatan onde-onde



Onde-onde sudah dikemas



Onde-onde siap dijual

