# Appendix D. Seasonal and Trend decomposition using LOESS (STL)

## Broccoli

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## Cabbage

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## Carrot

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## Cauliflower

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## Celery

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## Chayote (Bunga)

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## Cucumber

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## Gabi (Galyang)

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## Pepper (Sultan)

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## Pepper (Taiwan)

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## Potato

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## wombok

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# Appendix E. Models Generated by Automatic ARIMA and ETS in Time Series Cross-Validation

|  | **Vegetable** | **ARIMA** | **ETS** |
| --- | --- | --- | --- |
| 1 | broccoli | ARIMA(1,0,0) w/ mean | ETS(A,N,N) |
| 2 | broccoli | ARIMA(0,0,1) w/ mean | ETS(A,N,N) |
| 3 | broccoli | ARIMA(0,0,1) w/ mean | ETS(A,N,N) |
| 4 | broccoli | ARIMA(0,0,0)(0,1,0)[12] w/ drift | ETS(A,N,N) |
| 5 | broccoli | ARIMA(0,0,1)(0,1,0)[12] | ETS(A,N,N) |
| 6 | broccoli | ARIMA(0,0,1)(0,1,0)[12] | ETS(A,N,N) |
| 7 | broccoli | ARIMA(0,0,1)(1,0,0)[12] w/ mean | ETS(A,N,N) |
| 8 | broccoli | ARIMA(0,0,1)(1,0,0)[12] w/ mean | ETS(A,N,N) |
| 9 | broccoli | ARIMA(0,0,1)(0,0,1)[12] w/ mean | ETS(A,N,N) |
| 10 | broccoli | ARIMA(2,0,0)(0,0,1)[12] w/ mean | ETS(A,N,N) |
| 11 | broccoli | ARIMA(2,0,0)(1,0,0)[12] w/ mean | ETS(A,N,N) |
| 12 | broccoli | ARIMA(2,1,1)(1,0,0)[12] | ETS(A,N,N) |
| 13 | broccoli | ARIMA(2,1,1)(1,0,0)[12] | ETS(A,N,N) |
| 14 | broccoli | ARIMA(2,1,2) | ETS(A,N,N) |
| 15 | broccoli | ARIMA(0,1,0)(1,0,0)[12] | ETS(A,N,N) |
| 1 | cabbage | ARIMA(1,0,0) w/ mean | ETS(M,N,N) |
| 2 | cabbage | ARIMA(1,0,0) w/ mean | ETS(M,N,N) |
| 3 | cabbage | ARIMA(1,0,0) w/ mean | ETS(M,N,N) |
| 4 | cabbage | ARIMA(1,0,0)(0,1,0)[12] | ETS(M,N,N) |
| 5 | cabbage | ARIMA(1,0,0)(0,1,0)[12] | ETS(M,N,N) |
| 6 | cabbage | ARIMA(1,0,0)(0,1,0)[12] | ETS(M,N,N) |
| 7 | cabbage | ARIMA(2,0,0) w/ mean | ETS(A,N,N) |
| 8 | cabbage | ARIMA(0,0,3) w/ mean | ETS(M,N,N) |
| 9 | cabbage | ARIMA(2,0,3) w/ mean | ETS(M,N,N) |
| 10 | cabbage | ARIMA(0,0,3) w/ mean | ETS(A,N,N) |
| 11 | cabbage | ARIMA(3,0,0) w/ mean | ETS(A,N,N) |
| 12 | cabbage | ARIMA(3,0,0) w/ mean | ETS(A,N,N) |
| 13 | cabbage | ARIMA(3,0,0) w/ mean | ETS(A,N,N) |
| 14 | cabbage | ARIMA(3,0,0) w/ mean | ETS(A,N,N) |
| 15 | cabbage | ARIMA(3,0,0)(1,0,0)[12] w/ mean | ETS(A,N,N) |
| 1 | carrot | ARIMA(2,0,0) w/ mean | ETS(M,N,N) |
| 2 | carrot | ARIMA(2,0,0) w/ mean | ETS(M,N,N) |
| 3 | carrot | ARIMA(0,0,2) w/ mean | ETS(A,N,N) |
| 4 | carrot | ARIMA(0,0,2) w/ mean | ETS(A,N,N) |
| 5 | carrot | ARIMA(0,0,1)(0,1,0)[12] | ETS(M,N,N) |
| 6 | carrot | ARIMA(0,0,2)(0,1,0)[12] | ETS(A,N,N) |
| 7 | carrot | ARIMA(0,0,2)(1,0,0)[12] w/ mean | ETS(A,N,N) |
| 8 | carrot | ARIMA(2,0,0)(0,0,1)[12] w/ mean | ETS(A,N,N) |
| 9 | carrot | ARIMA(2,0,0) w/ mean | ETS(A,N,N) |
| 10 | carrot | ARIMA(2,0,0) w/ mean | ETS(A,N,N) |
| 11 | carrot | ARIMA(1,0,1)(0,0,1)[12] w/ mean | ETS(A,N,N) |
| 12 | carrot | ARIMA(1,0,1)(0,0,1)[12] w/ mean | ETS(A,N,N) |
| 13 | carrot | ARIMA(1,1,2)(0,0,1)[12] | ETS(A,N,N) |
| 14 | carrot | ARIMA(1,0,1)(0,0,1)[12] w/ mean | ETS(A,N,N) |
| 15 | carrot | ARIMA(1,1,2)(0,0,1)[12] | ETS(A,N,N) |
| 1 | cauliflower | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 2 | cauliflower | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 3 | cauliflower | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 4 | cauliflower | ARIMA(0,0,0)(0,1,0)[12] | ETS(M,N,N) |
| 5 | cauliflower | ARIMA(0,0,0)(0,1,0)[12] | ETS(A,N,N) |
| 6 | cauliflower | ARIMA(0,1,1)(0,1,0)[12] | ETS(A,N,N) |
| 7 | cauliflower | ARIMA(0,0,1)(0,1,1)[12] | ETS(A,N,N) |
| 8 | cauliflower | ARIMA(0,0,1)(0,1,1)[12] | ETS(A,N,N) |
| 9 | cauliflower | ARIMA(1,0,0)(0,1,1)[12] | ETS(A,N,N) |
| 10 | cauliflower | ARIMA(0,0,1)(0,1,1)[12] w/ drift | ETS(A,N,N) |
| 11 | cauliflower | ARIMA(0,0,1)(0,1,1)[12] | ETS(A,N,A) |
| 12 | cauliflower | ARIMA(0,0,1)(1,1,0)[12] w/ drift | ETS(A,N,A) |
| 13 | cauliflower | ARIMA(0,0,1)(0,1,1)[12] w/ drift | ETS(A,A,A) |
| 14 | cauliflower | ARIMA(0,0,1)(0,1,1)[12] w/ drift | ETS(A,N,A) |
| 15 | cauliflower | ARIMA(0,0,1)(0,1,1)[12] w/ drift | ETS(A,A,A) |
| 1 | celery | ARIMA(1,0,0) w/ mean | ETS(M,N,N) |
| 2 | celery | ARIMA(1,0,0) w/ mean | ETS(M,N,N) |
| 3 | celery | ARIMA(1,0,1) w/ mean | ETS(M,N,N) |
| 4 | celery | ARIMA(0,1,0)(0,1,0)[12] | ETS(M,N,N) |
| 5 | celery | ARIMA(1,0,0)(0,1,0)[12] | ETS(M,N,N) |
| 6 | celery | ARIMA(0,0,1)(0,1,0)[12] | ETS(M,N,N) |
| 7 | celery | ARIMA(0,0,2) w/ mean | ETS(M,N,N) |
| 8 | celery | ARIMA(0,0,2) w/ mean | ETS(M,N,N) |
| 9 | celery | ARIMA(0,0,2) w/ mean | ETS(M,N,N) |
| 10 | celery | ARIMA(0,0,2) w/ mean | ETS(M,N,N) |
| 11 | celery | ARIMA(0,0,2) w/ mean | ETS(M,N,N) |
| 12 | celery | ARIMA(0,0,2) w/ mean | ETS(M,N,N) |
| 13 | celery | ARIMA(2,0,0) w/ mean | ETS(M,N,N) |
| 14 | celery | ARIMA(2,0,0) w/ mean | ETS(M,N,N) |
| 15 | celery | ARIMA(1,0,1) w/ mean | ETS(M,N,N) |
| 1 | chayote (bunga) | ARIMA(1,0,0) w/ mean | ETS(M,N,N) |
| 2 | chayote (bunga) | ARIMA(1,0,0) w/ mean | ETS(M,N,N) |
| 3 | chayote (bunga) | ARIMA(1,0,0) w/ mean | ETS(M,N,N) |
| 4 | chayote (bunga) | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 5 | chayote (bunga) | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 6 | chayote (bunga) | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 7 | chayote (bunga) | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 8 | chayote (bunga) | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 9 | chayote (bunga) | ARIMA(0,0,1)(0,0,1)[12] w/ mean | ETS(M,N,N) |
| 10 | chayote (bunga) | ARIMA(0,0,1)(0,0,1)[12] w/ mean | ETS(M,N,N) |
| 11 | chayote (bunga) | ARIMA(1,0,0) w/ mean | ETS(M,N,N) |
| 12 | chayote (bunga) | ARIMA(1,0,0) w/ mean | ETS(M,N,N) |
| 13 | chayote (bunga) | ARIMA(1,0,0) w/ mean | ETS(M,N,N) |
| 14 | chayote (bunga) | ARIMA(1,0,0) w/ mean | ETS(A,N,N) |
| 15 | chayote (bunga) | ARIMA(1,0,0) w/ mean | ETS(A,N,N) |
| 1 | cucumber | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 2 | cucumber | ARIMA(0,0,1) w/ mean | ETS(A,N,N) |
| 3 | cucumber | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 4 | cucumber | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 5 | cucumber | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 6 | cucumber | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 7 | cucumber | ARIMA(0,0,1) w/ mean | ETS(A,N,N) |
| 8 | cucumber | ARIMA(0,0,1) w/ mean | ETS(A,N,N) |
| 9 | cucumber | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 10 | cucumber | ARIMA(0,0,1) w/ mean | ETS(A,N,N) |
| 11 | cucumber | ARIMA(0,0,1) w/ mean | ETS(A,N,N) |
| 12 | cucumber | ARIMA(0,0,1) w/ mean | ETS(A,N,N) |
| 13 | cucumber | ARIMA(0,0,1) w/ mean | ETS(M,A,N) |
| 14 | cucumber | ARIMA(0,1,2) | ETS(M,A,N) |
| 15 | cucumber | ARIMA(0,1,2) | ETS(M,A,N) |
| 1 | gabi (galyang) | ARIMA(1,0,0) w/ mean | ETS(A,N,N) |
| 2 | gabi (galyang) | ARIMA(0,1,0) | ETS(A,N,N) |
| 3 | gabi (galyang) | ARIMA(0,1,0) w/ drift | ETS(A,N,N) |
| 4 | gabi (galyang) | ARIMA(1,0,0)(0,1,0)[12] | ETS(A,N,N) |
| 5 | gabi (galyang) | ARIMA(1,0,0)(0,1,0)[12] | ETS(A,N,N) |
| 6 | gabi (galyang) | ARIMA(0,1,0)(0,1,0)[12] | ETS(A,N,N) |
| 7 | gabi (galyang) | ARIMA(0,1,0)(1,1,0)[12] | ETS(A,N,N) |
| 8 | gabi (galyang) | ARIMA(0,1,0)(1,1,0)[12] | ETS(A,N,N) |
| 9 | gabi (galyang) | ARIMA(0,1,0) | ETS(A,N,N) |
| 10 | gabi (galyang) | ARIMA(1,0,0) w/ mean | ETS(A,N,N) |
| 11 | gabi (galyang) | ARIMA(1,0,0) w/ mean | ETS(A,N,N) |
| 12 | gabi (galyang) | ARIMA(1,0,0) w/ mean | ETS(A,N,N) |
| 13 | gabi (galyang) | ARIMA(1,0,0) w/ mean | ETS(A,N,N) |
| 14 | gabi (galyang) | ARIMA(1,0,0) w/ mean | ETS(A,N,N) |
| 15 | gabi (galyang) | ARIMA(1,0,0) w/ mean | ETS(A,N,N) |
| 1 | pepper (sultan) | ARIMA(1,0,0) w/ mean | ETS(A,N,N) |
| 2 | pepper (sultan) | ARIMA(1,0,0) w/ mean | ETS(M,N,N) |
| 3 | pepper (sultan) | ARIMA(2,0,2) w/ mean | ETS(A,N,N) |
| 4 | pepper (sultan) | ARIMA(3,0,0) w/ mean | ETS(A,N,N) |
| 5 | pepper (sultan) | ARIMA(1,0,0) w/ mean | ETS(A,N,N) |
| 6 | pepper (sultan) | ARIMA(0,0,2) w/ mean | ETS(A,N,N) |
| 7 | pepper (sultan) | ARIMA(1,0,0)(1,0,0)[12] w/ mean | ETS(A,N,N) |
| 8 | pepper (sultan) | ARIMA(1,0,0) w/ mean | ETS(A,N,N) |
| 9 | pepper (sultan) | ARIMA(1,0,0) w/ mean | ETS(A,N,N) |
| 10 | pepper (sultan) | ARIMA(1,0,0) w/ mean | ETS(A,N,N) |
| 11 | pepper (sultan) | ARIMA(2,0,1) w/ mean | ETS(A,N,N) |
| 12 | pepper (sultan) | ARIMA(2,0,1) w/ mean | ETS(A,N,N) |
| 13 | pepper (sultan) | ARIMA(3,0,0) w/ mean | ETS(A,N,N) |
| 14 | pepper (sultan) | ARIMA(2,0,1) w/ mean | ETS(A,N,N) |
| 15 | pepper (sultan) | ARIMA(3,0,0) w/ mean | ETS(A,N,N) |
| 1 | pepper (taiwan) | ARIMA(2,0,0) w/ mean | ETS(M,N,N) |
| 2 | pepper (taiwan) | ARIMA(1,0,2) w/ mean | ETS(A,A,N) |
| 3 | pepper (taiwan) | ARIMA(2,0,0) w/ mean | ETS(A,A,N) |
| 4 | pepper (taiwan) | ARIMA(2,0,0)(0,1,0)[12] | ETS(A,A,N) |
| 5 | pepper (taiwan) | ARIMA(1,0,0)(0,1,0)[12] | ETS(A,N,N) |
| 6 | pepper (taiwan) | ARIMA(1,0,0)(0,1,0)[12] | ETS(A,N,N) |
| 7 | pepper (taiwan) | ARIMA(0,0,3)(0,0,1)[12] w/ mean | ETS(A,N,N) |
| 8 | pepper (taiwan) | ARIMA(1,0,2)(1,0,0)[12] w/ mean | ETS(A,N,N) |
| 9 | pepper (taiwan) | ARIMA(0,0,3)(0,0,1)[12] w/ mean | ETS(A,N,N) |
| 10 | pepper (taiwan) | ARIMA(0,0,3) w/ mean | ETS(A,N,N) |
| 11 | pepper (taiwan) | ARIMA(0,0,3) w/ mean | ETS(A,N,N) |
| 12 | pepper (taiwan) | ARIMA(0,0,3) w/ mean | ETS(A,N,N) |
| 13 | pepper (taiwan) | ARIMA(0,0,3) w/ mean | ETS(A,N,N) |
| 14 | pepper (taiwan) | ARIMA(2,0,1) w/ mean | ETS(A,N,N) |
| 15 | pepper (taiwan) | ARIMA(0,0,3) w/ mean | ETS(A,N,N) |
| 1 | potato | ARIMA(1,0,0) w/ mean | ETS(M,N,N) |
| 2 | potato | ARIMA(2,0,0) w/ mean | ETS(M,N,N) |
| 3 | potato | ARIMA(3,0,0) w/ mean | ETS(M,N,N) |
| 4 | potato | ARIMA(2,0,0) w/ mean | ETS(M,N,N) |
| 5 | potato | ARIMA(0,1,0) | ETS(M,N,N) |
| 6 | potato | ARIMA(0,1,0) | ETS(M,N,N) |
| 7 | potato | ARIMA(0,1,0) | ETS(M,N,N) |
| 8 | potato | ARIMA(0,1,1) | ETS(M,N,N) |
| 9 | potato | ARIMA(2,0,0) w/ mean | ETS(M,N,N) |
| 10 | potato | ARIMA(2,0,0) w/ mean | ETS(M,N,N) |
| 11 | potato | ARIMA(2,0,0) w/ mean | ETS(M,N,N) |
| 12 | potato | ARIMA(2,0,0) w/ mean | ETS(M,N,N) |
| 13 | potato | ARIMA(2,0,0) w/ mean | ETS(M,N,N) |
| 14 | potato | ARIMA(2,0,0) w/ mean | ETS(M,N,N) |
| 15 | potato | ARIMA(2,1,2) | ETS(A,N,N) |
| 1 | wombok | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 2 | wombok | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 3 | wombok | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 4 | wombok | ARIMA(0,0,0)(0,1,0)[12] | ETS(M,N,N) |
| 5 | wombok | ARIMA(0,0,1)(0,1,0)[12] | ETS(M,N,N) |
| 6 | wombok | ARIMA(0,0,0)(0,1,0)[12] w/ drift | ETS(M,N,N) |
| 7 | wombok | ARIMA(0,0,1) w/ mean | ETS(M,N,N) |
| 8 | wombok | ARIMA(0,0,2) w/ mean | ETS(M,N,N) |
| 9 | wombok | ARIMA(0,0,2) w/ mean | ETS(M,N,N) |
| 10 | wombok | ARIMA(0,0,2) w/ mean | ETS(M,N,N) |
| 11 | wombok | ARIMA(0,0,2) w/ mean | ETS(M,N,N) |
| 12 | wombok | ARIMA(0,0,2) w/ mean | ETS(M,N,N) |
| 13 | wombok | ARIMA(0,0,2) w/ mean | ETS(M,N,N) |
| 14 | wombok | ARIMA(0,0,2) w/ mean | ETS(M,N,N) |
| 15 | wombok | ARIMA(0,0,2) w/ mean | ETS(M,N,N) |