

```

1 from statsmodels.tsa.statespace.sarimax import SARIMAX
2 import pandas as pd

```

```

1 data = pd.read_csv('/content/surabaya 2024-09-01 to 2024-10-01.csv', parse_dates=['datetime'])

```

```

1 import itertools
2 from tqdm import tqdm
3 p = d = q = range(0, 3) # ranges for ARIMA parameters, 0 - 2
4 seasonal_pdq = [(x[0], x[1], x[2], 24) for x in list(itertools.product(p, d, q))] # 12 for 12 months
5
6 best_aic = float("inf")
7 best_params = None
8 best_seasonal_params = None
9
10 for param in itertools.product(p, d, q):
11     for seasonal_param in tqdm(seasonal_pdq):
12         try:
13             model = SARIMAX(data['temp'],
14                             order=param,
15                             seasonal_order=seasonal_param,
16                             enforce_stationarity=False,
17                             enforce_invertibility=False)
18             results = model.fit(maxiter=200, disp=0) # Set disp=0 to reduce output verbosity
19         except Exception as e:
20             print(f"ARIMA{param}x{seasonal_param} - AIC: None - Exception: {e}")
21             continue # Continue to the next iteration
22
23     # Check if the current model AIC is lower than what we've seen before
24     if results.aic < best_aic:
25         best_aic = results.aic
26         best_params = param
27         best_seasonal_params = seasonal_param
28
29 # Print out the best parameters and AIC
30 if best_params is not None:
31     print(f"Best SARIMA parameters: {best_params}")
32     print(f"Best Seasonal parameters: {best_seasonal_params}")
33     print(f"Best AIC: {best_aic}")
34 else:
35     print("No suitable model was found.")

```

 warnings.warn("Maximum Likelihood optimization failed to "
100%|██████████| 27/27 [08:04<00:00, 17.94s/it]
33%|███████| 9/27 [00:33<02:11, 7.30s/it]/usr/local/lib/python3.10/dist-packages/statsmodels/base/model.py:607: ConvergenceWarning: Maximum Likelihood optimization failed to
44%|███████| 12/27 [00:40<01:06, 4.41s/it]/usr/local/lib/python3.10/dist-packages/statsmodels/base/model.py:607: ConvergenceWarning: Maximum Likelihood optimization failed to
warnings.warn("Maximum Likelihood optimization failed to "
100%|██████████| 27/27 [03:41<00:00, 8.21s/it]
100%|██████████| 27/27 [05:14<00:00, 11.65s/it]
100%|██████████| 27/27 [05:35<00:00, 12.41s/it]
100%|██████████| 27/27 [03:38<00:00, 8.10s/it]
19%|█████| 5/27 [00:12<00:59, 2.70s/it]/usr/local/lib/python3.10/dist-packages/statsmodels/base/model.py:607: ConvergenceWarning: Maximum Likelihood optimization failed to
81%|██████████| 22/27 [03:57<01:02, 12.52s/it]/usr/local/lib/python3.10/dist-packages/statsmodels/base/model.py:607: ConvergenceWarning: Maximum Likelihood optimization failed to
100%|██████████| 27/27 [07:36<00:00, 16.92s/it]
100%|██████████| 27/27 [12:35<00:00, 27.99s/it]
0%| | 0/27 [00:00<?, ?it/s]/usr/local/lib/python3.10/dist-packages/statsmodels/base/model.py:607: ConvergenceWarning: Maximum Likelihood optimization failed to
100%|██████████| 27/27 [05:26<00:00, 12.08s/it]
100%|██████████| 27/27 [07:00<00:00, 15.57s/it]
100%|██████████| 27/27 [08:12<00:00, 18.24s/it]
11%|█████| 3/27 [00:02<00:24, 1.01s/it]/usr/local/lib/python3.10/dist-packages/statsmodels/base/model.py:607: ConvergenceWarning: Maximum Likelihood optimization failed to
100%|██████████| 27/27 [05:14<00:00, 11.64s/it]
100%|██████████| 27/27 [09:32<00:00, 21.21s/it]
100%|██████████| 27/27 [16:44<00:00, 37.20s/it]
100%|██████████| 27/27 [04:33<00:00, 10.15s/it]
100%|██████████| 27/27 [08:22<00:00, 18.61s/it]
63%|███████| 17/27 [10:13<09:23, 56.31s/it]/usr/local/lib/python3.10/dist-packages/statsmodels/base/model.py:607: ConvergenceWarning: Maximum Likelihood optimization failed to
78%|██████████| 21/27 [16:53<06:51, 68.61s/it]/usr/local/lib/python3.10/dist-packages/statsmodels/base/model.py:607: ConvergenceWarning: Maximum Likelihood optimization failed to
100%|██████████| 27/27 [30:25<00:00, 67.61s/it]
100%|██████████| 27/27 [06:25<00:00, 14.29s/it]
0%| | 0/27 [00:00<?, ?it/s]/usr/local/lib/python3.10/dist-packages/statsmodels/base/model.py:607: ConvergenceWarning:

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100%|██████████| 21/27 [05:55<00:00, 13.18s/it]
100%|██████████| 27/27 [14:01<00:00, 31.16s/it]
100%|██████████| 27/27 [21:07<00:00, 46.94s/it]
100%|██████████| 27/27 [06:08<00:00, 13.63s/it]
70%|██████████| 19/27 [05:31<03:45, 28.23s/it]/usr/local/lib/python3.10/dist-packages/statsmodels/base/model.py:607: Convergence
warnings.warn("Maximum Likelihood optimization failed to ")
100%|██████████| 27/27 [10:47<00:00, 23.99s/it]
52%|██████████| 14/27 [10:30<09:16, 42.82s/it]/usr/local/lib/python3.10/dist-packages/statsmodels/base/model.py:607: Convergence
warnings.warn("Maximum Likelihood optimization failed to ")
63%|██████████| 17/27 [14:38<11:08, 66.83s/it]/usr/local/lib/python3.10/dist-packages/statsmodels/base/model.py:607: Convergence
warnings.warn("Maximum Likelihood optimization failed to ")
100%|██████████| 27/27 [46:26<00:00, 103.21s/it]Best SARIMA parameters: (1, 1, 2)
Best Seasonal parameters: (2, 1, 2, 24)
Best AIC: 1343.3408897038
```

1 Start coding or [generate](#) with AI.