

# approximate\_bayesian\_computation

## Parameters

cm\_name: abc\_10  
dataframe\_in: data\_missing\_10  
description: Approximate Bayesian Computation for Time Series  
diff\_func\_name: manhattan\_metrics  
diff\_func\_parameters: {}  
model\_method: approximate\_bayesian\_computation  
name: approximate\_bayesian\_computation  
parameters:  
  algorithm: pydream  
  decision\_variables:  
    - Manufacturing\_Time  
  epsilons:  
    - 1  
  n\_chains: 3  
  n\_draws: 20000  
  n\_iterations: 100  
  nfe: 15000  
  objectives:  
    - Manufacturer  
    - Export\_Port  
    - Transit\_Port  
    - Import\_Port  
    - Wholesales\_Distributor  
    - Retailer\_Amsterdam  
    - Retailer\_Utrecht  
    - Retailer\_Venlo  
  population\_size: 100  
  ranges\_variables:  
    - - 1  
      - 10  
  seed: 25  
report\_parameters: {}  
running\_time: 236604.64703273773  
type: calibrationmodel  
version: 1.0.0

## Results

Summary CalibrationModel with solutions:

	Manufacturing_Time	Distance
0	6.088734	18.339237
1	3.346351	9.171053
2	3.346351	9.171053
3	3.346351	9.171053
4	3.346351	9.171053
...	...	...
1873	2.986727	8.197844
1874	2.986728	8.197844
1875	2.986729	8.197846
1876	2.986730	8.197846

1877            2.986731   7.574828

[1878 rows x 2 columns]

with the most optimal solution:

    Manufacturing\_Time   Distance

0            2.986731   7.574828

with an acceptance percentage of 3.524919547129541%

# approximate\_bayesian\_computation

## Parameters

cm\_name: abc\_25  
dataframe\_in: data\_missing\_25  
description: Approximate Bayesian Computation for Time Series  
diff\_func\_name: manhattan\_metrics  
diff\_func\_parameters: {}  
model\_method: approximate\_bayesian\_computation  
name: approximate\_bayesian\_computation  
parameters:  
    algorithm: pydream  
    decision\_variables:  
        - Manufacturing\_Time  
    epsilons:  
        - 1  
    n\_chains: 3  
    n\_draws: 20000  
    n\_iterations: 100  
    nfe: 15000  
    objectives:  
        - Manufacturer  
        - Export\_Port  
        - Transit\_Port  
        - Import\_Port  
        - Wholesales\_Distributor  
        - Retailer\_Amsterdam  
        - Retailer\_Utrecht  
        - Retailer\_Venlo  
    population\_size: 100  
    ranges\_variables:  
        - - 1  
        - 10  
    seed: 25  
report\_parameters: {}  
running\_time: 265591.6097249985  
type: calibrationmodel  
version: 1.0.0

## Results

Summary CalibrationModel with solutions:

	Manufacturing_Time	Distance
0	1.878908	9.818027
1	1.878908	9.818027
2	1.878908	9.818027
3	1.878908	9.818027
4	1.878908	9.818027
...	...	...
2676	2.039210	8.446738
2677	2.039210	8.446738
2678	2.039210	8.446738
2679	2.039210	8.446738

2680            2.039188 8.577558

[2681 rows x 2 columns]

with the most optimal solution:

    Manufacturing\_Time Distance  
0            2.406555 6.057749

with an acceptance percentage of 6.377870041518683%

# approximate\_bayesian\_computation

## Parameters

cm\_name: abc\_50  
dataframe\_in: data\_missing\_50  
description: Approximate Bayesian Computation for Time Series  
diff\_func\_name: manhattan\_metrics  
diff\_func\_parameters: {}  
model\_method: approximate\_bayesian\_computation  
name: approximate\_bayesian\_computation  
parameters:  
  algorithm: pydream  
  decision\_variables:  
    - Manufacturing\_Time  
  epsilons:  
    - 1  
  n\_chains: 3  
  n\_draws: 20000  
  n\_iterations: 100  
  nfe: 15000  
  objectives:  
    - Manufacturer  
    - Export\_Port  
    - Transit\_Port  
    - Import\_Port  
    - Wholesales\_Distributor  
    - Retailer\_Amsterdam  
    - Retailer\_Utrecht  
    - Retailer\_Venlo  
  population\_size: 100  
  ranges\_variables:  
    - - 1  
      - 10  
  seed: 25  
report\_parameters: {}  
running\_time: 238826.08879041672  
type: calibrationmodel  
version: 1.0.0

## Results

Summary CalibrationModel with solutions:

	Manufacturing_Time	Distance
0	1.878908	13.811768
1	1.878908	13.811768
2	1.878908	13.811768
3	1.878908	13.811768
4	1.878908	13.811768
...	...	...
1286	2.039188	12.281260
1287	2.302959	11.181683
1288	1.868872	11.056660
1289	2.302959	11.181683

1290            1.868872 11.056660

[1291 rows x 2 columns]

with the most optimal solution:

    Manufacturing\_Time Distance

0            2.40645 9.687819

with an acceptance percentage of 3.161422640188085%

# approximate\_bayesian\_computation

## Parameters

cm\_name: abc\_75  
dataframe\_in: data\_missing\_75  
description: Approximate Bayesian Computation for Time Series  
diff\_func\_name: manhattan\_metrics  
diff\_func\_parameters: {}  
model\_method: approximate\_bayesian\_computation  
name: approximate\_bayesian\_computation  
parameters:  
  algorithm: pydream  
  decision\_variables:  
    - Manufacturing\_Time  
  epsilons:  
    - 1  
  n\_chains: 3  
  n\_draws: 20000  
  n\_iterations: 100  
  nfe: 15000  
  objectives:  
    - Manufacturer  
    - Export\_Port  
    - Transit\_Port  
    - Import\_Port  
    - Wholesales\_Distributor  
    - Retailer\_Amsterdam  
    - Retailer\_Utrecht  
    - Retailer\_Venlo  
  population\_size: 100  
  ranges\_variables:  
    - - 1  
      - 10  
  seed: 25  
report\_parameters: {}  
running\_time: 254030.39111804962  
type: calibrationmodel  
version: 1.0.0

## Results

Summary CalibrationModel with solutions:

	Manufacturing_Time	Distance
0	1.878908	17.852806
1	1.878908	17.852806
2	1.878908	17.852806
3	1.878908	17.852806
4	1.878908	17.852806
...	...	...
9335	1.878908	17.852806
9336	8.831117	45.210959
9337	6.088734	32.407915
9338	3.346351	22.975227

9339            1.000000 22.773762

[9340 rows x 2 columns]

with the most optimal solution:

	Manufacturing_Time	Distance
0	1.878908	17.852806
1	1.878908	17.852806
2	1.878908	17.852806
3	1.878908	17.852806
4	1.878908	17.852806
...	...	...
9331	1.878908	17.852806
9332	1.878908	17.852806
9333	1.878908	17.852806
9334	1.878908	17.852806
9335	1.878908	17.852806

[9336 rows x 2 columns]

with an acceptance percentage of 15.573674820335818%



# approximate\_bayesian\_computation

## Parameters

cm\_name: abc\_90  
dataframe\_in: data\_missing\_90  
description: Approximate Bayesian Computation for Time Series  
diff\_func\_name: manhattan\_metrics  
diff\_func\_parameters: {}  
model\_method: approximate\_bayesian\_computation  
name: approximate\_bayesian\_computation  
parameters:  
    algorithm: pydream  
    decision\_variables:  
        - Manufacturing\_Time  
    epsilons:  
        - 1  
    n\_chains: 3  
    n\_draws: 20000  
    n\_iterations: 100  
    nfe: 15000  
    objectives:  
        - Manufacturer  
        - Export\_Port  
        - Transit\_Port  
        - Import\_Port  
        - Wholesales\_Distributor  
        - Retailer\_Amsterdam  
        - Retailer\_Utrecht  
        - Retailer\_Venlo  
    population\_size: 100  
    ranges\_variables:  
        - - 1  
        - 10  
    seed: 25  
report\_parameters: {}  
running\_time: 227430.7083108425  
type: calibrationmodel  
version: 1.0.0

## Results

Summary CalibrationModel with solutions:

	Manufacturing_Time	Distance
0	1.878908	9.229912
1	1.878908	9.229912
2	1.878908	9.229912
3	1.878908	9.229912
4	1.878908	9.229912
...	...	...
2430	3.346348	11.532254
2431	3.346348	11.532254
2432	3.346348	11.532254
2433	3.346348	11.532254

2434            3.346348 11.532254

[2435 rows x 2 columns]

with the most optimal solution:

	Manufacturing_Time	Distance
0	1.878902	9.195812
1	1.878902	9.195812
2	1.878902	9.195812
3	1.878902	9.195812
4	1.878902	9.195812
5	1.878902	9.195812
6	1.878902	9.195812
7	1.878902	9.195812
8	1.878902	9.195812
9	1.878902	9.195812
10	1.878902	9.195812
11	1.878902	9.195812

with an acceptance percentage of 4.448668567522052%

# genetic\_algorithm

```
cm_name: ga_10
dataframe_in: data_missing_10
description: Genetic Algorithm for optimization of timeseries
diff_func_name: manhattan_metrics
diff_func_parameters: {}
model_method: genetic_algorithm
name: genetic_algorithm
parameters:
  algorithm: epsNSGAI1
  decision_variables:
    - Manufacturing_Time
  epsilons:
    - 1
  n_draws: 20000
  n_iterations: 100
  nfe: 15000
  objectives:
    - Manufacturer
    - Export_Port
    - Transit_Port
    - Import_Port
    - Wholesales_Distributor
    - Retailer_Amsterdam
    - Retailer_Utrecht
    - Retailer_Venlo
  population_size: 100
  ranges_variables:
    - - 1
    - 10
  seed: 25
report_parameters: {}
running_time: 181442.8535900116
type: calibrationmodel
version: 1.0.0
```

## Results

## Summary CalibrationModel with solutions

Manufacturing_Time	Manufacturer	Export_Port	Transit_Port	Import_Port	Wholesales_Distributor
Retailer_Amsterdam	Retailer_Utrecht	Retailer_Venlo			
0	2.406865	2.232574	2.232574	2.232574	2.232574
2.232574	2.232574				

[illegible]

# genetic\_algorithm

```

cm_name: ga_25
dataframe_in: data_missing_25
description: Genetic Algorithm for optimization of timeseries
diff_func_name: manhattan_metrics
diff_func_parameters: {}
model_method: genetic_algorithm
name: genetic_algorithm
parameters:
  algorithm: epsNSGAI1
  decision_variables:
    - Manufacturing_Time
  epsilons:
    - 1
  n_draws: 20000
  n_iterations: 100
  nfe: 15000
  objectives:
    - Manufacturer
    - Export_Port
    - Transit_Port
    - Import_Port
    - Wholesales_Distributor
    - Retailer_Amsterdam
    - Retailer_Utrecht
    - Retailer_Venlo
  population_size: 100
  ranges_variables:
    - - 1
    - 10
  seed: 25
report_parameters: {}
running_time: 178643.25455856323
type: calibrationmodel
version: 1.0.0

```

## Results

## Summary CalibrationModel with solutions

	Manufacturing_Time	Manufacturer	Export_Port	Transit_Port	Import_Port	Wholesales_Distributor
Retailer_Amsterdam		Retailer_Utrecht	Retailer_Venlo			
0	2.344852	2.367436	2.367436	2.367436	2.367436	2.367436
2.367436	2.367436					

[illegible]

# genetic\_algorithm

```

cm_name: ga_50
dataframe_in: data_missing_50
description: Genetic Algorithm for optimization of timeseries
diff_func_name: manhattan_metrics
diff_func_parameters: {}
model_method: genetic_algorithm
name: genetic_algorithm
parameters:
  algorithm: epsNSGAI1
  decision_variables:
    - Manufacturing_Time
  epsilons:
    - 1
  n_draws: 20000
  n_iterations: 100
  nfe: 15000
  objectives:
    - Manufacturer
    - Export_Port
    - Transit_Port
    - Import_Port
    - Wholesales_Distributor
    - Retailer_Amsterdam
    - Retailer_Utrecht
    - Retailer_Venlo
  population_size: 100
  ranges_variables:
    - - 1
    - 10
  seed: 25
report_parameters: {}
running_time: 179083.33589816093
type: calibrationmodel
version: 1.0.0

```

## Results

## Summary CalibrationModel with solutions

Manufacturing_Time	Manufacturer	Export_Port	Transit_Port	Import_Port	Wholesales_Distributor
Retailer_Amsterdam	Retailer_Utrecht	Retailer_Venlo			
0	2.502601	4.279514	4.279514	4.279514	4.279514
4.279514	4.279514				

[illegible]

# genetic\_algorithm

```

cm_name: ga_75
dataframe_in: data_missing_75
description: Genetic Algorithm for optimization of timeseries
diff_func_name: manhattan_metrics
diff_func_parameters: {}
model_method: genetic_algorithm
name: genetic_algorithm
parameters:
  algorithm: epsNSGAI1
  decision_variables:
    - Manufacturing_Time
  epsilons:
    - 1
  n_draws: 20000
  n_iterations: 100
  nfe: 15000
  objectives:
    - Manufacturer
    - Export_Port
    - Transit_Port
    - Import_Port
    - Wholesales_Distributor
    - Retailer_Amsterdam
    - Retailer_Utrecht
    - Retailer_Venlo
  population_size: 100
  ranges_variables:
    - - 1
    - 10
  seed: 25
report_parameters: {}
running_time: 181271.89301848412
type: calibrationmodel
version: 1.0.0

```

## Results

## Summary CalibrationModel with solutions

	Manufacturing_Time	Manufacturer	Export_Port	Transit_Port	Import_Port	Wholesales_Distributor
Retailer_Amsterdam	Retailer_Utrecht	Retailer_Venlo				
0	2.783026	8.264677	8.264677	8.264677	8.264677	8.264677
8.264677	8.264677					

[illegible]

# genetic\_algorithm

```

cm_name: ga_90
dataframe_in: data_missing_90
description: Genetic Algorithm for optimization of timeseries
diff_func_name: manhattan_metrics
diff_func_parameters: {}
model_method: genetic_algorithm
name: genetic_algorithm
parameters:
  algorithm: epsNSGAI1
  decision_variables:
    - Manufacturing_Time
  epsilons:
    - 1
  n_draws: 20000
  n_iterations: 100
  nfe: 15000
  objectives:
    - Manufacturer
    - Export_Port
    - Transit_Port
    - Import_Port
    - Wholesales_Distributor
    - Retailer_Amsterdam
    - Retailer_Utrecht
    - Retailer_Venlo
  population_size: 100
  ranges_variables:
    - - 1
    - 10
  seed: 25
report_parameters: {}
running_time: 181219.63345956802
type: calibrationmodel
version: 1.0.0

```

# Results

## Summary CalibrationModel with solutions

Manufacturer	Export_Port	Transit_Port	Import_Port	Wholesales_Distributor
Manufacturer_Amsterdam	Manufacturer_Utrecht	Manufacturer_Venlo		
0	2.399306	4.948529	4.948529	4.948529
4.948529	4.948529			

and eprogress is [4, 5, 5, 5, 6, 6, 6, 6, 6, 6, 7, 7, 7, 7, 8, 8, 8, 8, 8, 8, 9, 9, 9, 10, 10, 10, 10, 10, 10, 10, 10,  
10,  
10, 10, 10, 10, 10, 10, 10, 11,  
11,  
11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11, 11]

# powell\_method

## Parameters

cm\_name: powell\_10  
dataframe\_in: data\_missing\_10  
description: Powell Method for optimization of timeseries with simulation  
diff\_func\_name: manhattan\_metrics  
diff\_func\_parameters: {}  
model\_method: powell\_method  
name: powell\_method  
parameters:  
  decision\_variables:  
  - Manufacturing\_Time  
  epsilons:  
  - 1  
  n\_draws: 20000  
  n\_iterations: 100  
  nfe: 1500  
  objectives:  
  - Manufacturer  
  - Export\_Port  
  - Transit\_Port  
  - Import\_Port  
  - Wholesales\_Distributor  
  - Retailer\_Amsterdam  
  - Retailer\_Utrecht  
  - Retailer\_Venlo  
  population\_size: 100  
  ranges\_variables:  
  - - 1  
  - - 10  
  seed: 25  
report\_parameters: {}  
running\_time: 640.6124358177185  
type: calibrationmodel  
version: 1.0.0

## Results

Summary CalibrationModel with most optimal solution:

	Manufacturing_Time	Distance
0	1.884705	5.160852



# powell\_method

## Parameters

cm\_name: powell\_25  
dataframe\_in: data\_missing\_25  
description: Powell Method for optimization of timeseries with simulation  
diff\_func\_name: manhattan\_metrics  
diff\_func\_parameters: {}  
model\_method: powell\_method  
name: powell\_method  
parameters:  
  decision\_variables:  
  - Manufacturing\_Time  
  epsilons:  
  - 1  
  n\_draws: 20000  
  n\_iterations: 100  
  nfe: 1500  
  objectives:  
  - Manufacturer  
  - Export\_Port  
  - Transit\_Port  
  - Import\_Port  
  - Wholesales\_Distributor  
  - Retailer\_Amsterdam  
  - Retailer\_Utrecht  
  - Retailer\_Venlo  
  population\_size: 100  
  ranges\_variables:  
  - - 1  
  - - 10  
  seed: 25  
report\_parameters: {}  
running\_time: 636.2841372489929  
type: calibrationmodel  
version: 1.0.0

## Results

Summary CalibrationModel with most optimal solution:

	Manufacturing_Time	Distance
0	2.003605	5.095245

# powell\_method

## Parameters

cm\_name: powell\_50  
dataframe\_in: data\_missing\_50  
description: Powell Method for optimization of timeseries with simulation  
diff\_func\_name: manhattan\_metrics  
diff\_func\_parameters: {}  
model\_method: powell\_method  
name: powell\_method  
parameters:  
    decision\_variables:  
    - Manufacturing\_Time  
    epsilons:  
    - 1  
    n\_draws: 20000  
    n\_iterations: 100  
    nfe: 1500  
    objectives:  
    - Manufacturer  
    - Export\_Port  
    - Transit\_Port  
    - Import\_Port  
    - Wholesales\_Distributor  
    - Retailer\_Amsterdam  
    - Retailer\_Utrecht  
    - Retailer\_Venlo  
    population\_size: 100  
    ranges\_variables:  
    - - 1  
    - - 10  
    seed: 25  
report\_parameters: {}  
running\_time: 1236.4415321350098  
type: calibrationmodel  
version: 1.0.0

## Results

Summary CalibrationModel with most optimal solution:

	Manufacturing_Time	Distance
0	7.1063	13.330467

# powell\_method

## Parameters

cm\_name: powell\_75  
dataframe\_in: data\_missing\_75  
description: Powell Method for optimization of timeseries with simulation  
diff\_func\_name: manhattan\_metrics  
diff\_func\_parameters: {}  
model\_method: powell\_method  
name: powell\_method  
parameters:  
  decision\_variables:  
  - Manufacturing\_Time  
  epsilons:  
  - 1  
  n\_draws: 20000  
  n\_iterations: 100  
  nfe: 1500  
  objectives:  
  - Manufacturer  
  - Export\_Port  
  - Transit\_Port  
  - Import\_Port  
  - Wholesales\_Distributor  
  - Retailer\_Amsterdam  
  - Retailer\_Utrecht  
  - Retailer\_Venlo  
  population\_size: 100  
  ranges\_variables:  
  - - 1  
  - - 10  
  seed: 25  
report\_parameters: {}  
running\_time: 803.2283561229706  
type: calibrationmodel  
version: 1.0.0

## Results

Summary CalibrationModel with most optimal solution:

	Manufacturing_Time	Distance
0	6.561057	17.256006

# powell\_method

## Parameters

cm\_name: powell\_90  
dataframe\_in: data\_missing\_90  
description: Powell Method for optimization of timeseries with simulation  
diff\_func\_name: manhattan\_metrics  
diff\_func\_parameters: {}  
model\_method: powell\_method  
name: powell\_method  
parameters:  
  decision\_variables:  
  - Manufacturing\_Time  
  epsilons:  
  - 1  
  n\_draws: 20000  
  n\_iterations: 100  
  nfe: 1500  
  objectives:  
  - Manufacturer  
  - Export\_Port  
  - Transit\_Port  
  - Import\_Port  
  - Wholesales\_Distributor  
  - Retailer\_Amsterdam  
  - Retailer\_Utrecht  
  - Retailer\_Venlo  
  population\_size: 100  
  ranges\_variables:  
  - - 1  
  - - 10  
  seed: 25  
report\_parameters: {}  
running\_time: 645.2844970226288  
type: calibrationmodel  
version: 1.0.0

## Results

Summary CalibrationModel with most optimal solution:

	Manufacturing_Time	Distance
0	3.081048	8.929439

# Summary

Model Name	Model Method	Score	Difference Function	Dataframe	Duration	Solution Params
powell_90	powell_method	0.94	manhattan_metrics	data_missing_90	645.284 sec	{'Manufacturing_Time': 3.081048279348146}
powell_75	powell_method	0.55	manhattan_metrics	data_missing_75	803.228 sec	{'Manufacturing_Time': 6.561056978161545}
powell_50	powell_method	0.49	manhattan_metrics	data_missing_50	1236.442 sec	{'Manufacturing_Time': 7.106299758431337}
powell_25	powell_method	0.94	manhattan_metrics	data_missing_25	636.284 sec	{'Manufacturing_Time': 2.0036054843117963}
powell_10	powell_method	0.93	manhattan_metrics	data_missing_10	640.612 sec	{'Manufacturing_Time': 1.8847050625473183}
ga_90	genetic_algorithm	0.99	manhattan_metrics	data_missing_90	181219.633 sec	{'Manufacturing_Time': 2.399306325797444}
ga_75	genetic_algorithm	0.97	manhattan_metrics	data_missing_75	181271.893 sec	{'Manufacturing_Time': 2.783025795121972}
ga_50	genetic_algorithm	1.0	manhattan_metrics	data_missing_50	179083.336 sec	{'Manufacturing_Time': 2.502600836499572}
ga_25	genetic_algorithm	0.98	manhattan_metrics	data_missing_25	178643.255 sec	{'Manufacturing_Time': 2.344851893233995}
ga_10	genetic_algorithm	0.99	manhattan_metrics	data_missing_10	181442.854 sec	{'Manufacturing_Time': 2.4068654951441646}
abc_90	approximate_bayesian_computation	0.93	manhattan_metrics	data_missing_90	227430.708 sec	{'Manufacturing_Time': 1.8789021684139149}
abc_75	approximate_bayesian_computation	0.93	manhattan_metrics	data_missing_75	254030.391 sec	{'Manufacturing_Time': 1.8789084435273447}
abc_50	approximate_bayesian_computation	0.99	manhattan_metrics	data_missing_50	238826.089 sec	{'Manufacturing_Time': 2.406450346485384}
abc_25	approximate_bayesian_computation	0.99	manhattan_metrics	data_missing_25	265591.610 sec	{'Manufacturing_Time': 2.4065551345595946}
abc_10	approximate_bayesian_computation	0.95	manhattan_metrics	data_missing_10	236604.647 sec	{'Manufacturing_Time': 2.9867305773178265}