Resampling Time Series

Resampling Time Series

- What is Resampling?

- Why is resampling important?

- Different methods of resampling time series data

What is Resampling?

seconds	minute	hourly	Daily	Weekly	Monthly	Yearly

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What is Resampling?

seconds	minute	hourly	Daily	Weekly	Monthly	Yearly

What is Resampling?

seconds	minute	hourly	Daily	Weekly	Monthly	Yearly

```
12:00  ⎫
01:00  ⎪
02:00  ⎪
03:00  ⎪
.      ⎪
       ⎬  Aggregation
.      ⎪
.      ⎪
.      ⎪
22:00  ⎪
23:00  ⎪
24:00  ⎭
```

What is Resampling?

Resampling: Changing the frequency of the time series

| seconds | minute | hourly | Daily | Weekly | Monthly | Yearly |

Why Resample Time Series?

Resampling: Changing the frequency of the time series

Why Resample the Data?

Why Resample Time Series?

Resampling: Changing the frequency of the time series

Why Resample the Data?

- To reduce the humongous amount of data captured

Why Resample Time Series?

Resampling: Changing the frequency of the time series

Why Resample the Data?

- To reduce the humongous amount of data captured

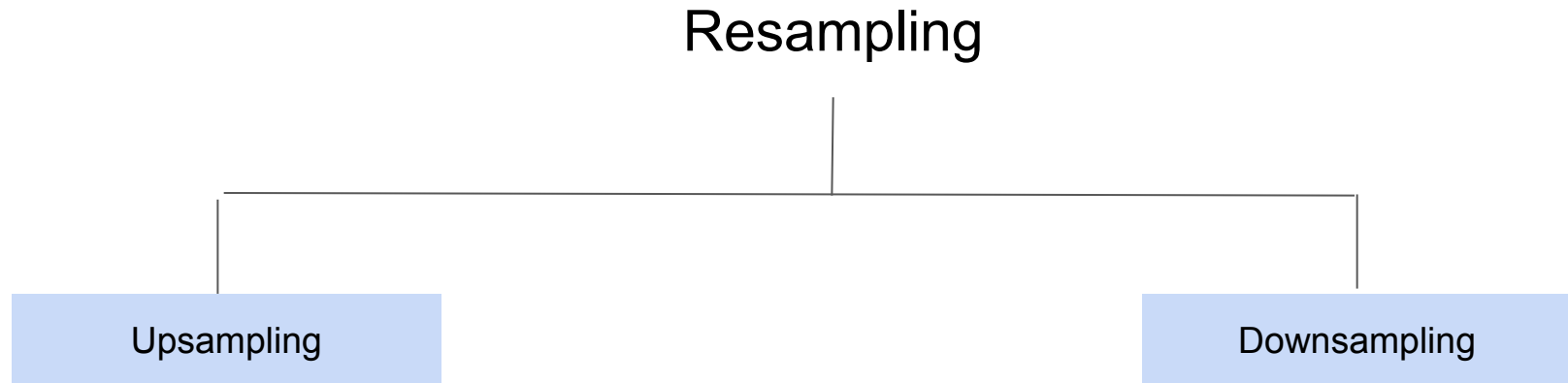- Forecasts required for a different frequency

Why Resample Time Series?

Resampling: Changing the frequency of the time series

Why Resample the Data?

- To reduce the humongous amount of data captured

- Forecasts required for a different frequency

- Reduce the noise in the data

Resampling Time Series

Resampling: Changing the frequency of the time series

Resampling

Upsampling

Downsampling

Resampling Time Series

Resampling: Changing the frequency of the time series

Resampling

Upsampling

Downsampling

- Increase frequency of samples

- Decrease frequency of samples

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Resampling Time Series

Resampling

Upsampling

Downsampling

- Increase frequency of samples

- Decrease frequency of samples

Take an average/sum of values

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Resampling Time Series

Resampling

Upsampling	Downsampling

- Increase frequency of samples

- Decrease frequency of samples

Interpolation

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Resampling Time Series

Date	Count
2012-08-01	204
2012-08-07	228
2012-08-14	201
2012-08-21	229

Date	Count
2012-08-01	204
2012-08-02	NaN
2012-08-03	NaN
2012-08-04	NaN
2012-08-05	NaN
2012-08-06	NaN
2012-08-07	228

208

212

216

220

224

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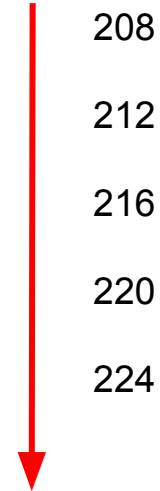
Notebook

Resampling Time Series
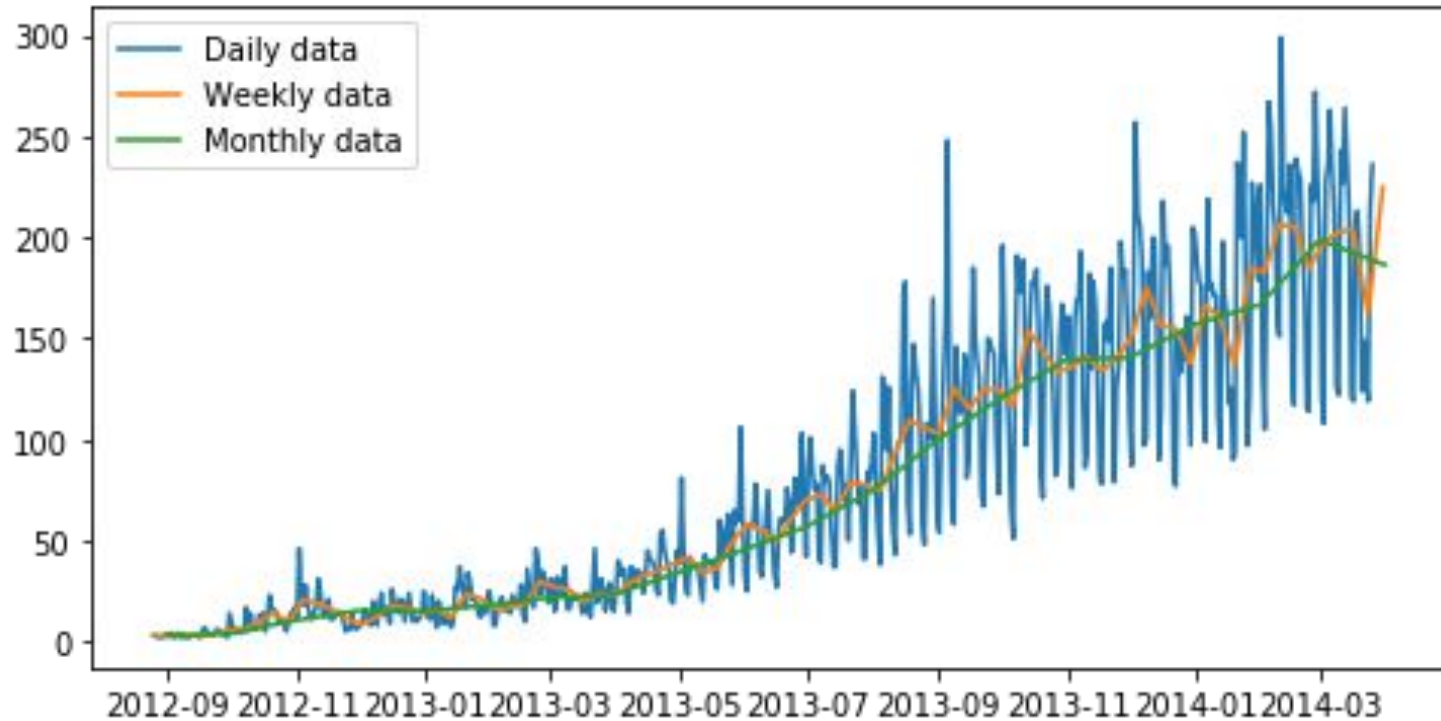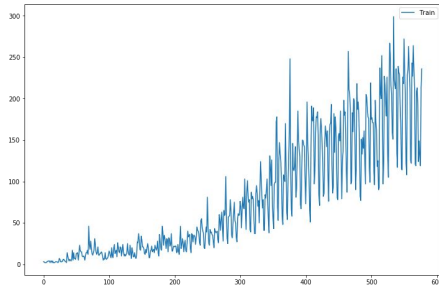
Resampling Time Series

Original Data

Resampling Time Series

| Original Data | → | Downsampling |

Resampling Time Series

| Original Data | → | Downsampling | → | Predictions |

Resampling Time Series

Original Data	→	Downsampling	→	Predictions	→	Upsample

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Resampling Time Series

Original Data → Downsampling → Predictions → Upsample
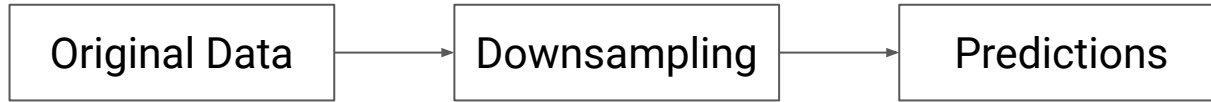
Date Time	#traffic
26/7/19 11:00	567
26/7/19 12:00	1346
26/7/19 01:00	1700
.	.
.	.
26/8/20 06:00	239

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Resampling Time Series

Original Data → Downsampling → Predictions → Upsample

Date Time	#traffic
26/7/19	940
27/7/19	996
28/7/19	982
.	.
.	.
26/8/20	1021

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Resampling Time Series

Original Data	→	Downsampling	→	Predictions	→	Upsample

Date Time	#traffic
27/8/20	1011
29/8/20	1031
30/8/20	1127
.	.
.	.
21/10/20	1891

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Resampling Time Series

| Original Data | → | Downsampling | → | Predictions | → | Upsample |

Date Time	#traffic
26/7/19 11:00	567	← Lower at morning
26/7/19 12:00	1346	←
26/7/19 01:00	1700	← Higher at noon
.	.
.	.
26/8/20 06:00	239	← Lower at eve

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Thank You