Demo: Dimensionless Model with Smoothing

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13 December, 2019

This document contains demos for smoothing with and without noise.

```
require(here)
```

```
## Loading required package: here
```

```
## here() starts at /Users/zanebillings/Stuff/Research/Lawson_380/Lawson_380_R_code
```

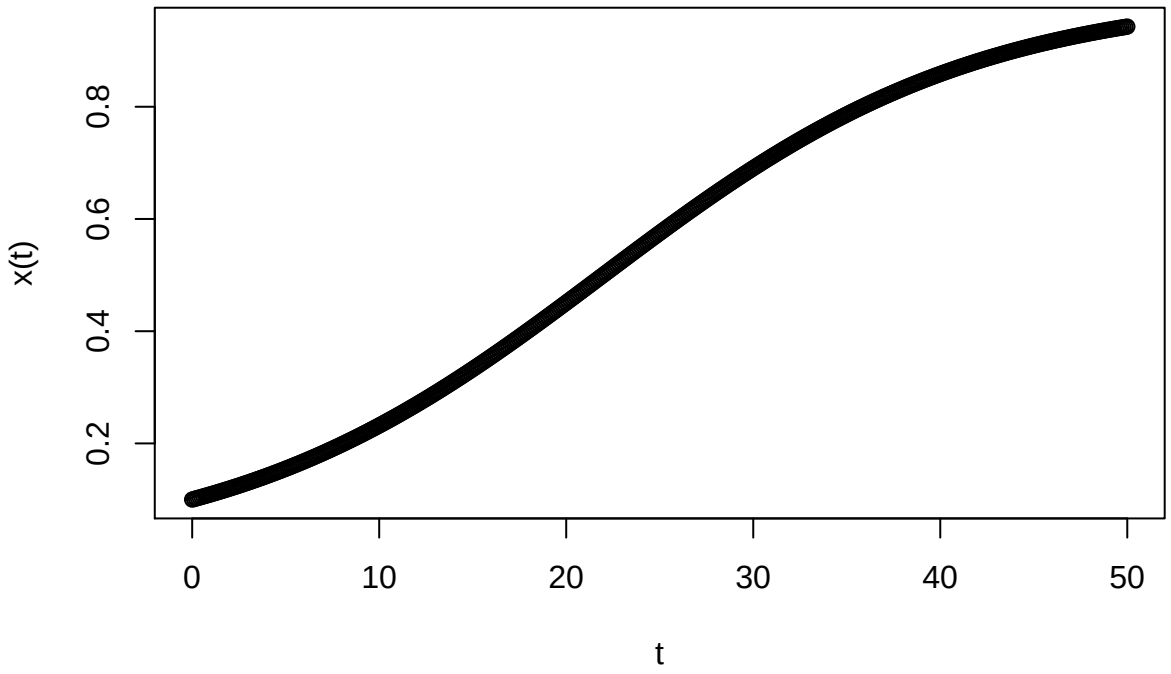
```
source(here::here("Scripts", "Dimensionless_exploration.R"))
```

```
## Loading required package: MASS
```

```
source(here::here("Scripts", "Helpers.R"))
set.seed(300)
```

First without noise.

```
test_1p_nn <- generate_dimensionless_logistic_data(.1, 0.1, 50, 0.1, TRUE)
```




```
prep_1p_nn <- prep_data(test_1p_nn)
cat("Regular; no noise.\n")
```

```
## Regular; no noise.
```

```
plain_1p_nn <- model_logistic_data_dimensionless(prep_1p_nn)
```

```
## The estimated growth rate is: 0.09993782
```

```
cat("Smoothing = 0.001; no noise\n")
```

```
## Smoothing = 0.001; no noise
```

```
ridge_1p_nn <- model_logistic_data_dimensionless_smoothing(prep_1p_nn, 0.001, print_res = TRUE)
```

```
## The estimated growth rate is: 0.09993516
```

```
cat("Smoothing = 0.01; no noise\n")
```

```
## Smoothing = 0.01; no noise
```

```
ridge_1p_nn <- model_logistic_data_dimensionless_smoothing(prep_1p_nn, 0.01, print_res = TRUE)
```

```
## The estimated growth rate is: 0.09991123
```

```
cat("Smoothing = 0.1; no noise\n")
```

```
## Smoothing = 0.1; no noise
```

```
ridge_1p_nn <- model_logistic_data_dimensionless_smoothing(prep_1p_nn, 0.1, print_res = TRUE)
```

```
## The estimated growth rate is: 0.09967248
```

```
cat("Smoothing = 1; no noise\n")
```

```
## Smoothing = 1; no noise
```

```
ridge_1p_nn <- model_logistic_data_dimensionless_smoothing(prep_1p_nn, 1, print_res = TRUE)
```

```
## The estimated growth rate is: 0.09734628
```

```
cat("Smoothing = 10 ; no noise\n")
```

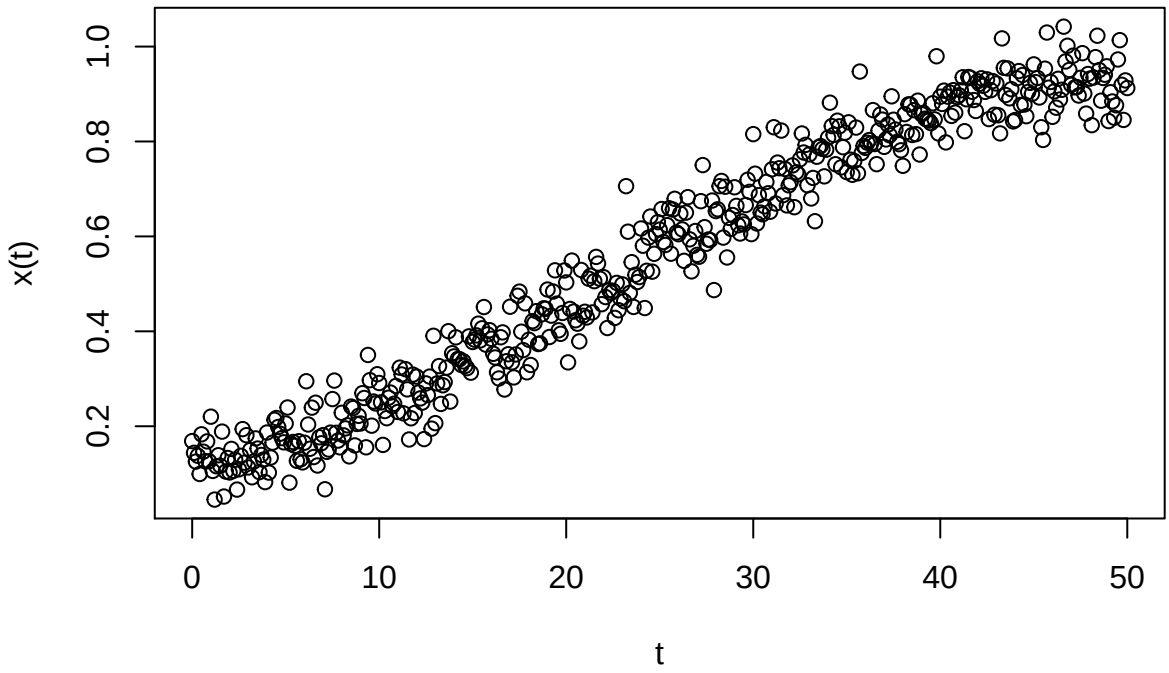
```
## Smoothing = 10 ; no noise
```

```
ridge_1p_nn <- model_logistic_data_dimensionless_smoothing(prep_1p_nn, 10, print_res = TRUE)
```

```
## The estimated growth rate is: 0.07892615
```

And again with noise.

```
test_1p_wn <- generate_noisy_dimensionless_logistic_data(0.1, 0.1, 0.05, 50, 0.1, TRUE)
```




```
prep_1p_wn <- prep_data(test_1p_wn)
cat("Regular; no noise.\n")
```

```
## Regular; no noise.
```

```
plain_1p_wn <- model_logistic_data_dimensionless(prep_1p_wn)
```

```
## The estimated growth rate is: 0.1557859
```

```
cat("Smoothing = 0.001; 4% noise\n")
```

```
## Smoothing = 0.001; 4% noise
```

```
ridge_1p_wn <- model_logistic_data_dimensionless_smoothing(prep_1p_wn, 0.001,print_res = TRUE)
```

```
## The estimated growth rate is: 0.1557816
```

```
cat("Smoothing = 0.01; 4% noise\n")
```

```
## Smoothing = 0.01; 4% noise
```

```
ridge_1p_wn <- model_logistic_data_dimensionless_smoothing(prep_1p_wn, 0.01,print_res = TRUE)
```

```
## The estimated growth rate is: 0.1557432
```

```
cat("Smoothing = 0.1; 4% noise\n")
```

```
## Smoothing = 0.1; 4% noise
```

```
ridge_1p_wn <- model_logistic_data_dimensionless_smoothing(prep_1p_wn, 0.1,print_res = TRUE)
```

```
## The estimated growth rate is: 0.1553596
```

```
cat("Smoothing = 1; 4% noise\n")
```

```
## Smoothing = 1; 4% noise
```

```
ridge_1p_wn <- model_logistic_data_dimensionless_smoothing(prep_1p_wn, 1,print_res = TRUE)
```

```
## The estimated growth rate is: 0.1516253
```

```
cat("Smoothing = 10 ; 4% noise\n")
```

```
## Smoothing = 10 ; 4% noise
```

```
ridge_1p_wn <- model_logistic_data_dimensionless_smoothing(prep_1p_wn, 10,print_res = TRUE)
```

```
## The estimated growth rate is: 0.1222424
```

```
cat("Smoothing = 20 ; 4% noise\n")
```

```
## Smoothing = 20 ; 4% noise
```

```
ridge_1p_wn <- model_logistic_data_dimensionless_smoothing(prep_1p_wn, 20,print_res = TRUE)
```

```
## The estimated growth rate is: 0.1005848
```

```
cat("Smoothing = 100 ; 4% noise\n")
```

```
## Smoothing = 100 ; 4% noise
```

```
ridge_1p_wn <- model_logistic_data_dimensionless_smoothing(prep_1p_wn, 100,print_res = TRUE)
```

```
## The estimated growth rate is: 0.04160936
```