

# Stepwise

MP

2015-06-05

```
> setwd("D:/Dropbox/R/2015-NUS/Session-2/(c) Data Modelling - More Selective/Variable selection")
```

```
> Dataset <-
+ read.table("D:/Dropbox/R/2015-NUS/Session-2/(c) Data Modelling - More Selective/Variable selection/Table 5.1 Sales-and-Assets.c
+ header=TRUE, sep=",", na.strings="NA", dec=".", strip.white=TRUE)
```

```
> RegModel.1 <- lm(Profit~Assets+Sales, data=Dataset)
> summary(RegModel.1)
```

```
Call:
lm(formula = Profit ~ Assets + Sales, data = Dataset)

Residuals:
    Min       1Q   Median       3Q      Max
-909.09  -39.15   30.83  117.77  316.85

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) -88.156655  127.569747  -0.691   0.503
Assets        0.005871   0.012341   0.476   0.643
Sales         0.020070   0.020180   0.995   0.340

Residual standard error: 319.3 on 12 degrees of freedom
Multiple R-squared:  0.6385,    Adjusted R-squared:  0.5783
F-statistic: 10.6 on 2 and 12 DF,  p-value: 0.002231
```

```
> library(MASS, pos=14)
```

```
> stepwise(RegModel.1, direction='forward/backward', criterion='AIC')
```

```
Direction: forward/backward
Criterion: AIC

Start: AIC=186.9
Profit ~ 1

      Df Sum of Sq  RSS   AIC
+ Sales  1  2138027 1246504 173.92
+ Assets  1  2060251 1324280 174.82
<none>                 3384531 186.90
```

```
Step: AIC=173.92
Profit ~ Sales

      Df Sum of Sq  RSS   AIC
<none>                 1246504 173.92
+ Assets  1     23069 1223435 175.64
- Sales  1  2138027 3384531 186.90
```

```
Call:
lm(formula = Profit ~ Sales, data = Dataset)
```

```
Coefficients:
(Intercept)      Sales
 -124.85492     0.02918
```

```
> stepwise(RegModel.1, direction='backward/forward', criterion='AIC')
```

Direction: backward/forward  
Criterion: AIC

Start: AIC=175.64  
Profit ~ Assets + Sales

	Df	Sum of Sq	RSS	AIC
- Assets	1	23069	1246504	173.92
- Sales	1	100845	1324280	174.82
<none>			1223435	175.64

Step: AIC=173.92  
Profit ~ Sales

	Df	Sum of Sq	RSS	AIC
<none>			1246504	173.92
+ Assets	1	23069	1223435	175.64
- Sales	1	2138027	3384531	186.90

Call:

```
lm(formula = Profit ~ Sales, data = Dataset)
```

Coefficients:

(Intercept)	Sales
-124.85492	0.02918