

# Lab X

Model Selection

BICselect(pdata)

Degree: 0 BIC: 127.4748: BASELINE

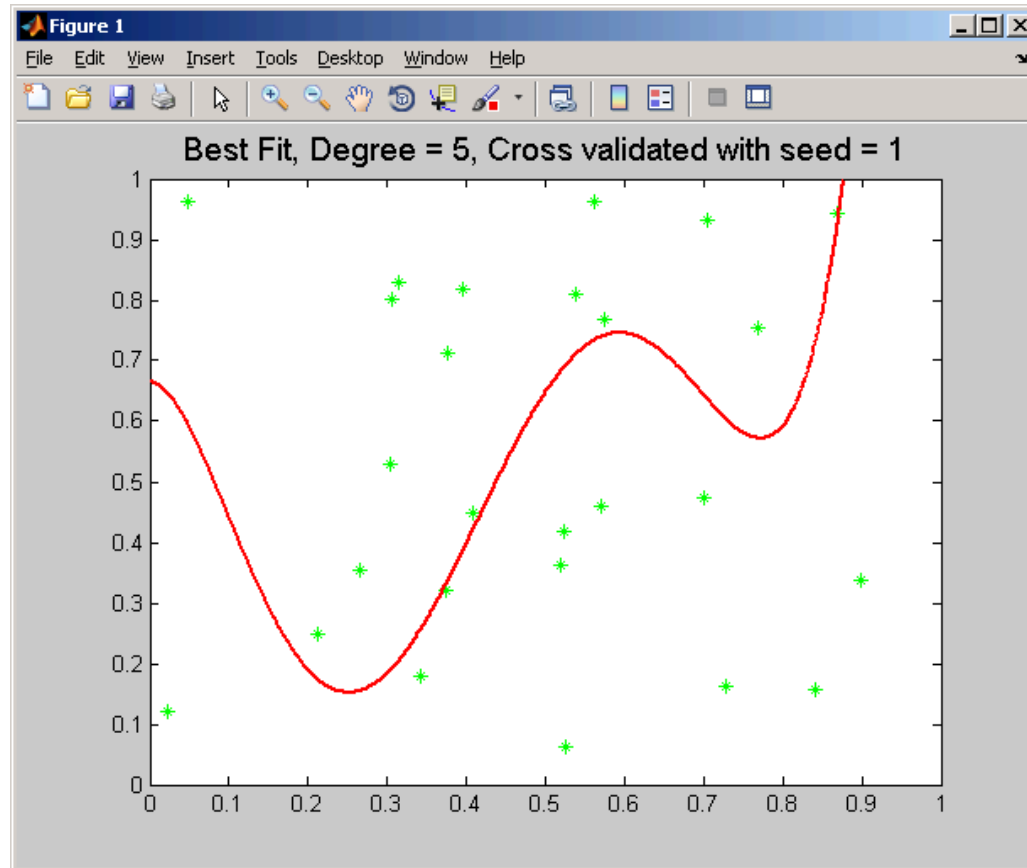
Degree: 1 BIC: 110.4282: BETTER

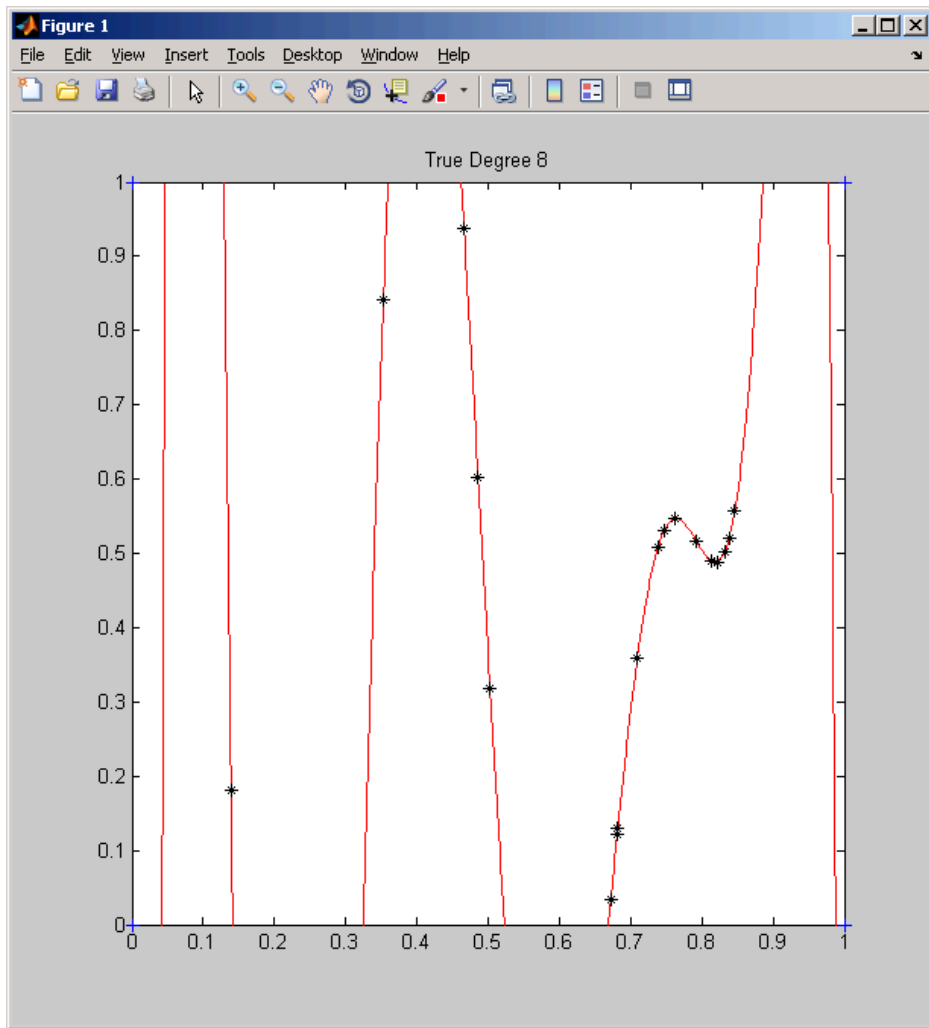
Degree: 2 BIC: 103.4339: BETTER

Degree: 3 BIC: 106.8758: WORSE

BIC deems the answer DEGREE 2

RECALL: The polynomial that generated the data had DEGREE 8





ICselect(pdata2)

Degree: 0 BIC: 75663234444.6625: BASELINE

Degree: 1 BIC: 46521343073.9288: BETTER

Degree: 2 BIC: 31192449084.4709: BETTER

Degree: 3 BIC: 21396943779.7498: BETTER

Degree: 4 BIC: 20839764672.3975: BETTER

Degree: 5 BIC: 19473389633.4365: BETTER

Degree: 6 BIC: 11999493765.4897: BETTER

Degree: 7 BIC: 2531026136.5608: BETTER

Degree: 8 BIC: -833.0322: BETTER

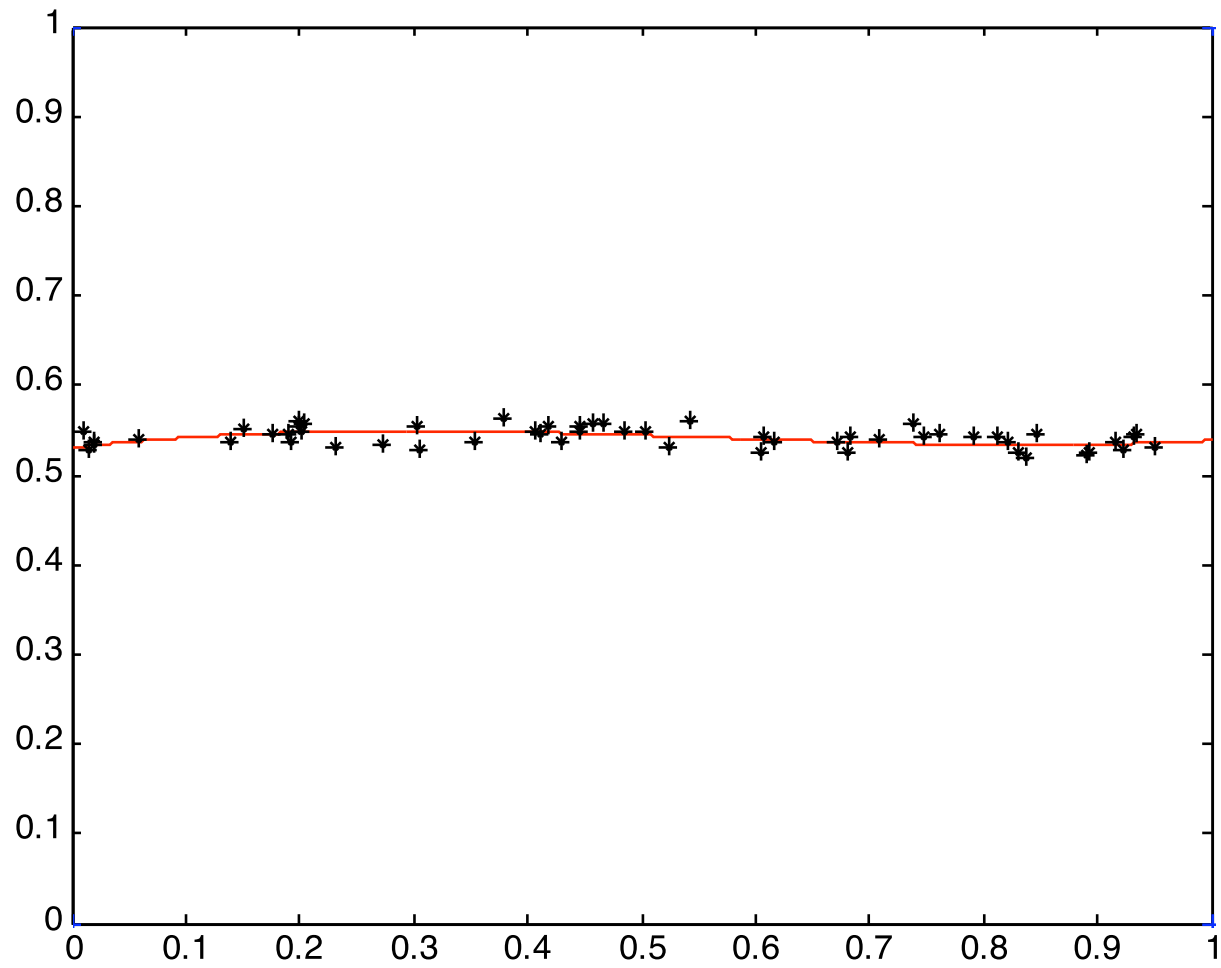
Degree: 9 BIC: -832.7031: WORSE

BIC deems the answer DEGREE 8

RECALL: The polynomial that generated the data had DEGREE 8

## X.2

Here is a nearly degenerate cubic that looks like a line.



AICselect(pdata)

Degree: 0 AIC: -339.9033: BASELINE

Degree: 1 AIC: -342.8023: BETTER

Degree: 2 AIC: -348.8404: BETTER

Degree: 3 AIC: -348.1716: WORSE

AIC deems the answer DEGREE 2

RECALL: The polynomial that generated the data had DEGREE 3

BICselect(pdata)

Degree: 0 BIC: -337.8959: BASELINE

Degree: 1 BIC: -338.7876: BETTER

Degree: 2 BIC: -342.8184: BETTER

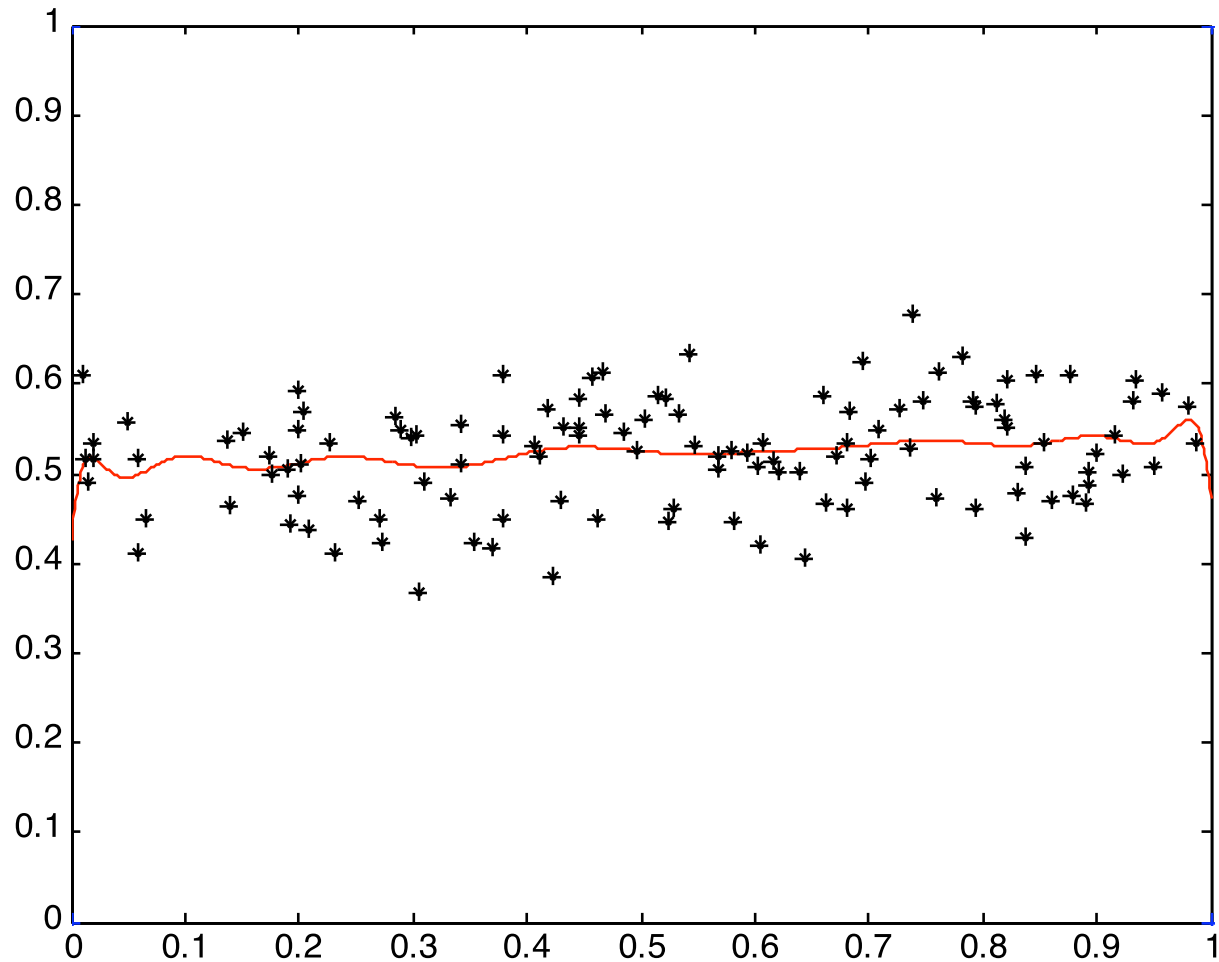
Degree: 3 BIC: -340.1423: WORSE

BIC deems the answer DEGREE 2

RECALL: The polynomial that generated the data had DEGREE 3

We see that in both cases the algorithms are not fooled and both come up with a 3<sup>rd</sup> degree polynomial.

Now I will try the same procedure but with more points (both a higher degree generating polynomial, and more generated points) and more noise.

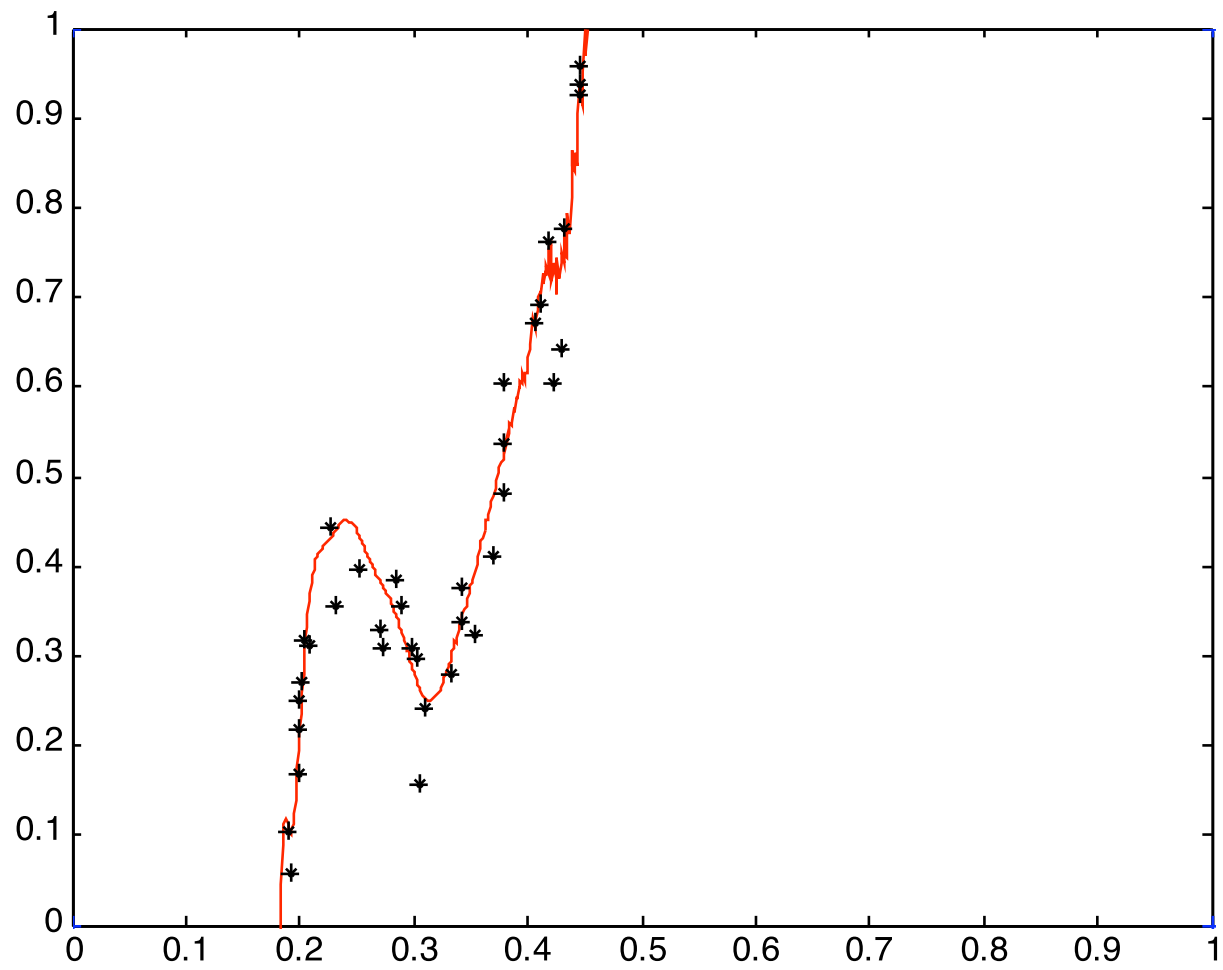


AIC deems the answer DEGREE 1

RECALL: The polynomial that generated the data had DEGREE 16

BIC deems the answer DEGREE 0

RECALL: The polynomial that generated the data had DEGREE 16





Degree: 20 AIC: 75084439704.3039: WORSE

AIC deems the answer DEGREE 19

RECALL: The polynomial that generated the data had DEGREE 19

Degree: 20 BIC: 75084439762.8412: WORSE

BIC deems the answer DEGREE 19

RECALL: The polynomial that generated the data had DEGREE 19