ZunZun.com

User-Selectable Polynomial

$$y = a + bx^1 + cx^2 + dx^3 + fx^4 + gx^5$$

Sat Jan 14 09:49:08 2012 local server time

Coefficients

$y = a + bx^1 + cx^2 + dx^3 + fx^4 + gx^5$

Fitting target of sum of squared absolute error = 1.3505389288458527E-01

a = -8.4097800007490842E-02

b = 2.9441026205860817E-02

c = -2.2510482809416973E-03

d = 6.7531476738040715E-05

f = -8.7124305801522832E-07

g = 5.0209073738927135E-09

Coefficient and Fit Statistics

From scipy.odr.odrpack and http://www.scipy.org/Cookbook/OLS

Degrees of freedom (error): 122.0
Degrees of freedom (regression): 5.0
R-squared: 0.999991108189
R-squared adjusted: 0.999990743771
Model F-statistic: 2744073.65809
Model F-statistic p-value: 1.11022302463e-16
Model log-likelihood: 257.039012554
AIC: -3.92248457116
BIC: -3.78879565254
Root Mean Squared Error (RMSE): 0.0324824343016

a = -8.4097800007490842E-02
       std err squared: 2.72405E-04
       t-stat: -5.09539E+00
       p-stat: 1.28596E-06
       95% confidence intervals: [-1.16770E-01, -5.14251E-02]
b = 2.9441026205860817E-02
       std err squared: 7.08648E-06
       t-stat: 1.10596E+01
       p-stat: 0.00000E+00
       95% confidence intervals: [2.41712E-02, 3.47108E-02]
c = -2.2510482809416973E-03
       std err squared: 1.72064E-08
       t-stat: -1.71609E+01
       p-stat: 0.00000E+00
       95% confidence intervals: [-2.51072E-03, -1.99138E-03]
d = 6.7531476738040715E-05
       std err squared: 6.91850E-12
       t-stat: 2.56744E+01
       p-stat: 0.00000E+00
       95% confidence intervals: [6.23245E-05, 7.27384E-05]
f = -8.7124305801522832E-07
       std err squared: 5.22899E-16
       t-stat: -3.81005E+01
       p-stat: 0.00000E+00
       95% confidence intervals: [-9.16511E-07, -8.25976E-07]
g = 5.0209073738927135E-09
       std err squared: 5.13456E-21
       t-stat: 7.00698E+01
       p-stat: 0.00000E+00
       95% confidence intervals: [4.87906E-09, 5.16276E-09]

Coefficient Covariance Matrix
[2.46074789e-01 -3.37449038e-02   1.41104213e-03 -2.48969505e-05   1.95260362e-07 -5.61536442e-10]
[-3.37449038e-02   6.40152243e-03 -3.04827111e-04   5.77206467e-06 -4.73276075e-08   1.40336631e-10]
[1.41104213e-03 -3.04827111e-04   1.55432517e-05 -3.07172042e-07   2.59355812e-09 -7.85663432e-12]
[-2.48969505e-05   5.77206467e-06 -3.07172042e-07   6.24977991e-09 -5.38984564e-11   1.65926768e-13]
[1.95260362e-07 -4.73276075e-08   2.59355812e-09 -5.38984564e-11   4.72357284e-13 -1.47265160e-15]
[-5.61536442e-10   1.40336631e-10 -7.85663432e-12   1.65926768e-13 -1.47265160e-15   4.63826889e-18]

Error Statistics

	Absolute Error	Relative Error
Minimum:	-8.853625E-02	-1.691956E+02
Maximum:	9.221118E-02	1.735017E+01
Mean:	2.352419E-08	-1.537071E+00
Std. Error of Mean:	2.882350E-03	1.607463E+00
Median:	2.238268E-03	2.681876E-04
Variance:	1.055109E-03	3.281601E+02
Standard Deviation:	3.248243E-02	1.811519E+01
Pop. Variance (N-1):	1.055109E-03	3.281601E+02
Pop. Std Dev (N-1):	3.248243E-02	1.811519E+01
Variation:	1.380810E+06	-1.178552E+01
Skew:	-1.219862E-01	-7.391623E+00
Kurtosis:	-3.985413E-01	6.045224E+01

Data Statistics

	X	Y
Minimum:	0.000000E+00	5.000000E-04
Maximum:	1.270000E+02	4.500000E+01
Mean:	6.350000E+01	6.707898E+00
Std. Error of Mean:	3.278719E+00	9.666107E-01
Median:	6.350000E+01	9.835000E-01
Variance:	1.365250E+03	1.186607E+02
Standard Deviation:	3.694929E+01	1.089315E+01
Pop. Variance (N-1):	1.365250E+03	1.186607E+02
Pop. Std Dev (N-1):	3.694929E+01	1.089315E+01
Variation:	5.818786E-01	1.623929E+00
Skew:	0.000000E+00	1.886122E+00
Kurtosis:	-1.200146E+00	2.644673E+00

Source Code in C++

```
// To the best of my knowledge this code is correct.
// If you find any errors or problems please contact
// me at zunzun@zunzun.com.
//      James


#include

// sum of squared absolute error

double Polynomial2D_model(double x_in)
{
    double temp;
    temp = 0.0;

    // coefficients
    double a = -8.4097800007490842E-02;
    double b = 2.9441026205860817E-02;
    double c = -2.2510482809416973E-03;
    double d = 6.7531476738040715E-05;
    double f = -8.7124305801522832E-07;
    double g = 5.0209073738927135E-09;

    temp = g;
    temp = temp * x_in + f;
    temp = temp * x_in + d;
    temp = temp * x_in + c;
    temp = temp * x_in + b;
    temp = temp * x_in + a;
    return temp;
}
```

Source Code in Java

```
// To the best of my knowledge this code is correct.
// If you find any errors or problems please contact
// me at zunzun@zunzun.com.
//      James


import java.lang.Math;

// sum of squared absolute error

class Polynomial2D
{
    double Polynomial2D_model(double x_in)
    {
        double temp;
        temp = 0.0;

        // coefficients
        double a = -8.4097800007490842E-02;
        double b = 2.9441026205860817E-02;
        double c = -2.2510482809416973E-03;
        double d = 6.7531476738040715E-05;
        double f = -8.7124305801522832E-07;
        double g = 5.0209073738927135E-09;

        temp = g;
        temp = temp * x_in + f;
        temp = temp * x_in + d;
        temp = temp * x_in + c;
        temp = temp * x_in + b;
        temp = temp * x_in + a;
        return temp;
    }
}
```

Source Code in Python

```
# To the best of my knowledge this code is correct.
# If you find any errors or problems please contact
# me at zunzun@zunzun.com.
#      James


import math

# sum of squared absolute error

def Polynomial2D_model(x_in):
    temp = 0.0

    # coefficients
    a = -8.4097800007490842E-02
    b = 2.9441026205860817E-02
    c = -2.2510482809416973E-03
    d = 6.7531476738040715E-05
    f = -8.7124305801522832E-07
    g = 5.0209073738927135E-09

    temp = g
    temp = temp * x_in + f
    temp = temp * x_in + d
    temp = temp * x_in + c
    temp = temp * x_in + b
    temp = temp * x_in + a
    return temp
```

Source Code in C#

```
// To the best of my knowledge this code is correct.
// If you find any errors or problems please contact
// me at zunzun@zunzun.com.
//      James


using System;

// sum of squared absolute error

class Polynomial2D
{
    double Polynomial2D_model(double x_in)
    {
        double temp;
        temp = 0.0;

        // coefficients
        double a = -8.4097800007490842E-02;
        double b = 2.9441026205860817E-02;
        double c = -2.2510482809416973E-03;
        double d = 6.7531476738040715E-05;
        double f = -8.7124305801522832E-07;
        double g = 5.0209073738927135E-09;

        temp = g;
        temp = temp * x_in + f;
        temp = temp * x_in + d;
        temp = temp * x_in + c;
        temp = temp * x_in + b;
        temp = temp * x_in + a;
        return temp;
    }
}
```

Source Code in SCILAB

```
// To the best of my knowledge this code is correct.
// If you find any errors or problems please contact
// me at zunzun@zunzun.com.
//      James

// sum of squared absolute error

function y=Polynomial2D_model(x_in)
    temp = 0.0

    // coefficients
    a = -8.4097800007490842E-02
    b = 2.9441026205860817E-02
    c = -2.2510482809416973E-03
    d = 6.7531476738040715E-05
    f = -8.7124305801522832E-07
    g = 5.0209073738927135E-09

    temp = g
    temp = temp * x_in + f
    temp = temp * x_in + d
    temp = temp * x_in + c
    temp = temp * x_in + b
    temp = temp * x_in + a

    y = temp
endfunction
```

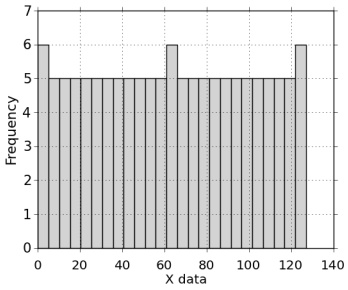
Source Code in MATLAB

```
% To the best of my knowledge this code is correct.
% If you find any errors or problems please contact
% me at zunzun@zunzun.com.
%      James

% sum of squared absolute error

function y=Polynomial2D_model(x_in)
    temp = 0.0;

    % coefficients
    a = -8.4097800007490842E-02;
    b = 2.9441026205860817E-02;
    c = -2.2510482809416973E-03;
    d = 6.7531476738040715E-05;
    f = -8.7124305801522832E-07;
    g = 5.0209073738927135E-09;

    temp = g;
    temp = temp .* x_in + f;
    temp = temp .* x_in + d;
    temp = temp .* x_in + c;
    temp = temp .* x_in + b;
    temp = temp .* x_in + a;

    y = temp;
```

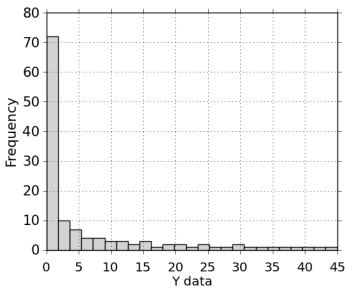
Source Code in VBA

```
' To the best of my knowledge this code is correct.
' If you find any errors or problems please contact
' me at zunzun@zunzun.com.
'      James


' sum of squared absolute error

Public Function Polynomial2D_model(x_in)

    temp = 0.0

    ' coefficients
    a = -8.4097800007490842E-02
    b = 2.9441026205860817E-02
    c = -2.2510482809416973E-03
    d = 6.7531476738040715E-05
    f = -8.7124305801522832E-07
    g = 5.0209073738927135E-09

    temp = g
    temp = temp * x_in + f
    temp = temp * x_in + d
    temp = temp * x_in + c
    temp = temp * x_in + b
    temp = temp * x_in + a
    Polynomial2D_model = temp
End Function
```

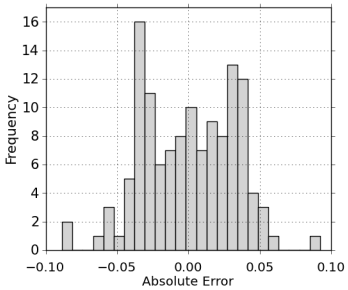
Histogram of X data



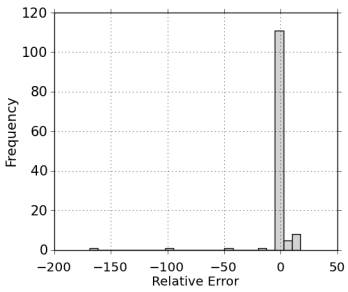
Histogram of Y data



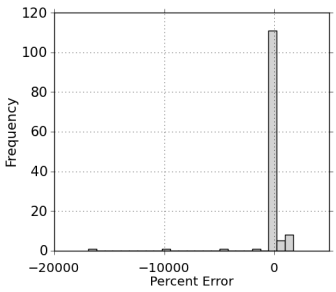
Histogram of Absolute Error



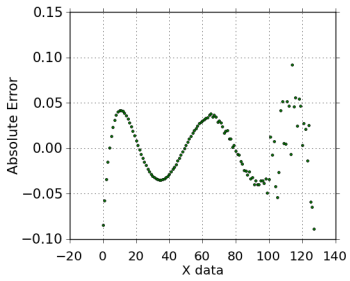
Histogram of Relative Error



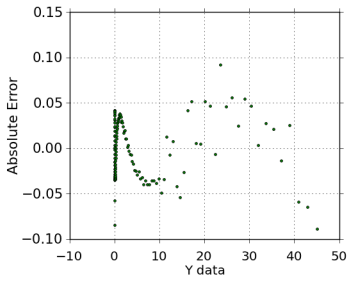
Histogram of Percent Error



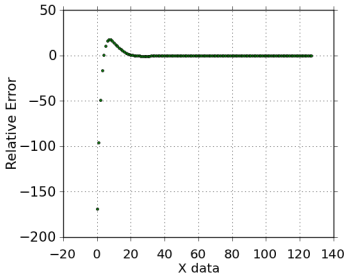
Absolute Error vs. X data



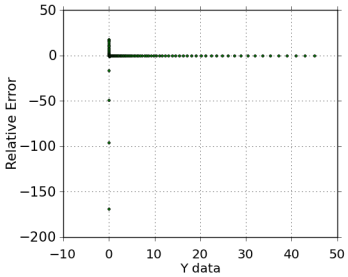
Absolute Error vs. Y data



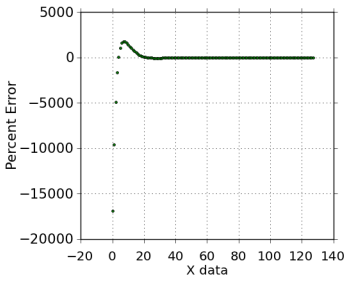
Relative Error vs. X data



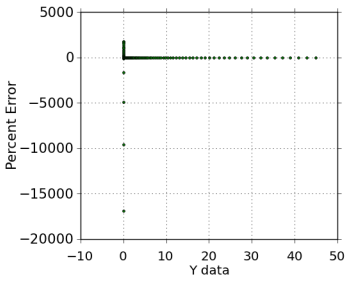
Relative Error vs. Y data



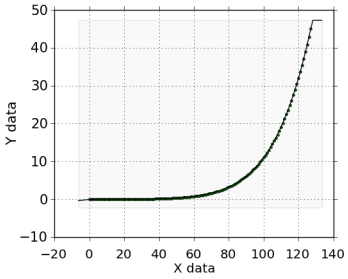
Percent Error vs. X data



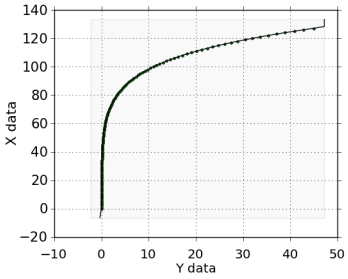
Percent Error vs. Y data



Y data vs. X data with model



X data vs. Y data with model



Psalm 147:1-6

Praise ye the LORD: for it is good to sing praises unto our God; for it is pleasant; and praise is comely. The LORD doth build up Jerusalem: he gathereth together the outcasts of Israel. He healeth the broken in heart, and bindeth up their wounds. He telleth the number of the stars; he calleth them all by their names. Great is our Lord, and of great power: his understanding is infinite. The LORD lifteth up the meek: he casteth the wicked down to the ground.