Linear

$$z = a + bx + cy$$

Sun Aug 7 03:35:39 2011 local server time

Coefficients

z = a + bx + cy
Fitting target of sum of squared absolute error = 2.3353174318996742E+04
a = 1.2215614194099456E+02
b = -5.1172533329322327E+00
c = -1.6554342722236552E+00

Coefficient and Fit Statistics

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

Degrees of freedom (error): 294.0
Degrees of freedom (regression): 2.0
R-squared: 0.924387166968
R-squared adjusted: 0.923872793954
Model F-statistic: 1797.11443277
Model F-statistic p-value: 1.11022302463e-16
Model log-likelihood: -1069.5910193
AIC: 7.22283514681
BIC: 7.26014557245
Root Mean Squared Error (RMSE): 8.86736807414

a = 1.2215614194099456E+02
        std err squared: 2.21659E+00
        t-stat: 8.20489E+01
        p-stat: 0.00000E+00
        95% confidence intervals: [1.19226E+02, 1.25086E+02]
b = -5.1172533329322327E+00
        std err squared: 1.36764E-02
        t-stat: -4.37573E+01
        p-stat: 0.00000E+00
        95% confidence intervals: [-5.34741E+00, -4.88710E+00]
c = -1.6554342722236552E+00
        std err squared: 3.06693E-02
        t-stat: -9.45278E+00
        p-stat: 0.00000E+00
        95% confidence intervals: [-2.00009E+00, -1.31077E+00]

Coefficient Covariance Matrix
[0.02790527 -0.00051964 -0.00203166]
[-0.00051964 0.00017218 -0.00014437]
[-0.00203166 -0.00014437 0.00038611]

Error Statistics

NOTE: Relative error statistics cannot be compiled, as at least one of
the dependent variable data points contains a value of exactly zero.

	Absolute Error
Minimum:	-2.394438E+01
Maximum:	2.406446E+01
Mean:	5.861379E-15
Std. Error of Mean:	5.154053E-01
Median:	-8.022236E-02
Variance:	7.863022E+01
Standard Deviation:	8.867368E+00
Pop. Variance (N-1):	7.863022E+01
Pop. Std Dev (N-1):	8.867368E+00
Variation:	1.512847E+15
Skew:	1.821327E-01
Kurtosis:	-2.739241E-01

Data Statistics

	X	Y	Z
Minimum:	-2.182694E+00	2.117000E+00	0.000000E+00
Maximum:	1.997262E+01	1.815300E+01	1.200263E+02
Mean:	1.082422E+01	9.309370E+00	5.135484E+01
Std. Error of Mean:	3.102292E-01	2.071650E-01	1.874352E+00
Median:	1.112746E+01	9.336000E+00	4.933485E+01
Variance:	2.848768E+01	1.270354E+01	1.039906E+03
Standard Deviation:	5.337385E+00	3.564202E+00	3.224757E+01
Pop. Variance (N-1):	2.848768E+01	1.270354E+01	1.039906E+03
Pop. Std Dev (N-1):	5.337385E+00	3.564202E+00	3.224757E+01
Variation:	4.930967E-01	3.828618E-01	6.279364E-01
Skew:	-1.553927E-01	1.557580E-02	2.013286E-01
Kurtosis:	-9.545515E-01	-8.235543E-01	-1.195433E+00

Source Code in C++


```cpp
// 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 Linear3D_model(double x_in, double y_in)
{
    double temp;
    temp = 0.0;

    // coefficients
    double a = 1.2215614194099456E+02;
    double b = -5.1172533329322327E+00;
    double c = -1.6554342722236552E+00;

    temp += a;
    temp += b * x_in;
    temp += c * y_in;
    return temp;
}
```

Source Code in Java

```java
import java.lang.Math;

// sum of squared absolute error

class Linear3D
{
    double Linear3D_model(double x_in, double y_in)
    {
        double temp;
        temp = 0.0;

        // coefficients
        double a = 1.2215614194099456E+02;
        double b = -5.1172533329322327E+00;
        double c = -1.6554342722236552E+00;

        temp += a;
        temp += b * x_in;
        temp += c * y_in;
        return temp;
    }
}
```

Source Code in Python


```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 Linear3D_model(x_in, y_in):
    temp = 0.0

    # coefficients
    a = 1.2215614194099456E+02
    b = -5.1172533329322327E+00
    c = -1.6554342722236552E+00

    temp += a
    temp += b * x_in
    temp += c * y_in
    return temp
```

Source Code in C#

```csharp
using System;

// sum of squared absolute error

class Linear3D
{
    double Linear3D_model(double x_in, double y_in)
    {
        double temp;
        temp = 0.0;

        // coefficients
        double a = 1.2215614194099456E+02;
        double b = -5.1172533329322327E+00;
        double c = -1.6554342722236552E+00;

        temp += a;
        temp += b * x_in;
        temp += c * y_in;
        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 z=Linear3D_model(x_in, y_in)
    temp = 0.0

    // coefficients
    a = 1.2215614194099456E+02
    b = -5.1172533329322327E+00
    c = -1.6554342722236552E+00

    temp = temp + a
    temp = temp + b * x_in
    temp = temp + c * y_in

    z = temp
endfunction
```

Source Code in MATLAB


```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 z=Linear3D_model(x_in, y_in)
    temp = 0.0;

    % coefficients
    a = 1.2215614194099456E+02;
    b = -5.1172533329322327E+00;
    c = -1.6554342722236552E+00;

    temp = temp + a;
    temp = temp + b .* x_in;
    temp = temp + c .* y_in;

    z = temp;
```

Source Code in VBA


```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 Linear3D_model(x_in, y_in)

    temp = 0.0

    ' coefficients
    a = 1.2215614194099456E+02
    b = -5.1172533329322327E+00
    c = -1.6554342722236552E+00

    temp = temp + a
    temp = temp + b * x_in
    temp = temp + c * y_in
    Linear3D_model = temp
End Function
```

Histogram of OT
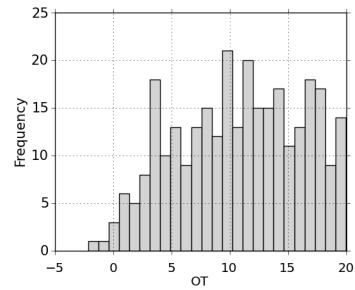
Histogram of TS
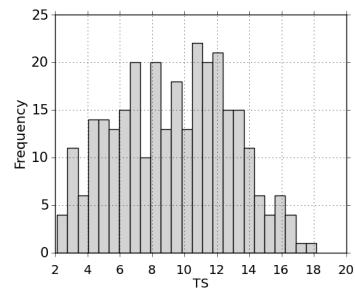
Histogram of TH
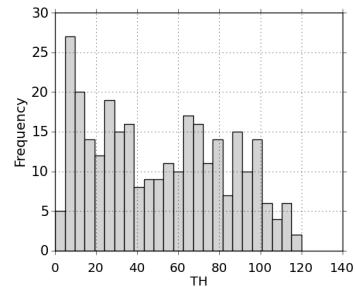
Histogram of Absolute Error
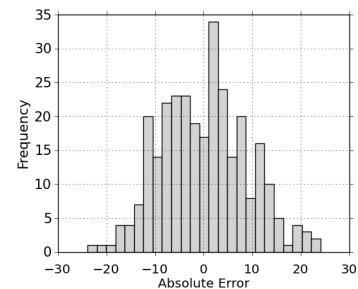
Absolute Error vs. OT
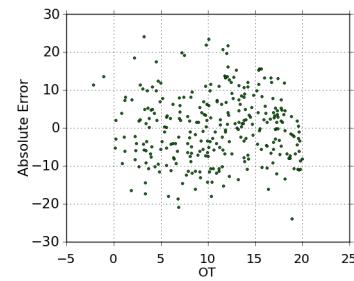
Absolute Error vs. TS
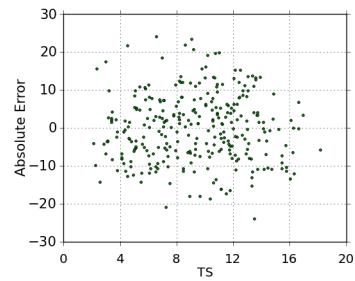
Absolute Error vs. TH
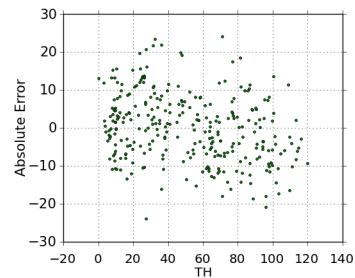
Absolute Error Scatter Plot
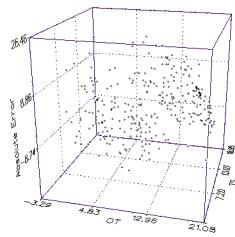
TH vs. OT
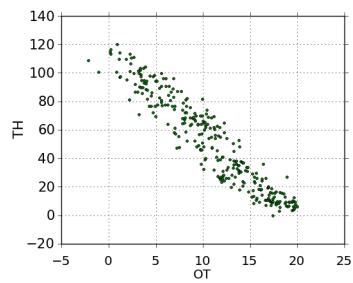
TH vs. TS
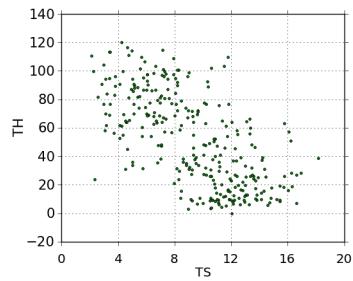
OT vs. TH
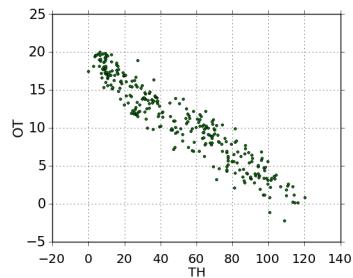
OT vs. TS
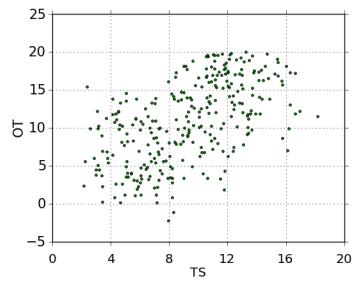
TS vs. TH
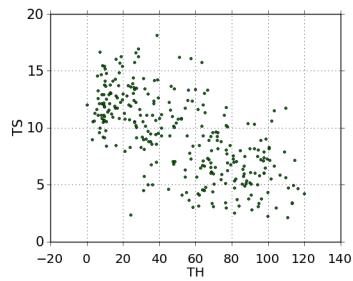
TS vs. OT
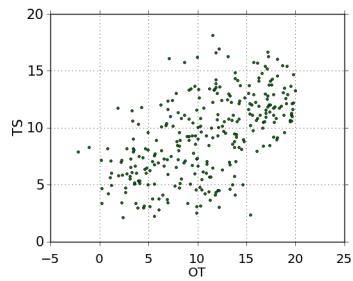
Scatter Plot
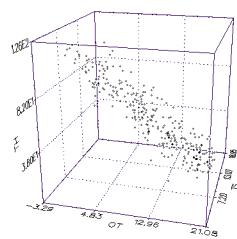
Surface Plot
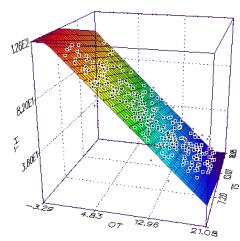
Contour Plot
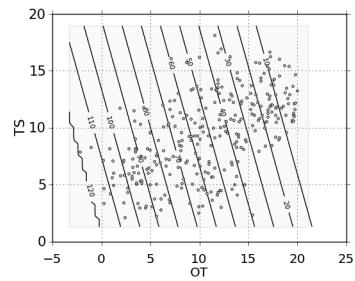
Matthew 10:11-16

And into whatsoever city or town ye shall enter, enquire who in it is worthy; and there abide till ye go thence. And when ye come into an house, salute it. And if the house be worthy, let your peace come upon it: but if it be not worthy, let your peace return to you. And whosoever shall not receive you, nor hear your words, when ye depart out of that house or city, shake off the dust of your feet. Verily I say unto you, It shall be more tolerable for the land of Sodom and Gomorrha in the day of judgment, than for that city. Behold, I send you forth as sheep in the midst of wolves: be ye therefore wise as serpents, and harmless as doves.