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LAMPIRAN

Lampiran 1. Data Indeks Pembangunan Manusia di Indonesia Tahun 2022

Provinsi	Y	X_1	X_2	X_3	X_4
Aceh	72,80	70,18	14,37	9,44	9963
Sumatera Utara	72,71	69,61	13,31	9,71	10848
Sumatera Barat	73,26	69,90	14,10	9,18	11130
Riau	73,52	71,95	13,29	9,22	11158
Jambi	72,14	71,50	13,05	8,68	10871
Sumatera Selatan	70,90	70,32	12,55	8,37	11109
Bengkulu	72,16	69,69	13,68	8,91	10840
Lampung	70,45	70,99	12,74	8,18	10336
Kep. Bangka Belitung	72,24	70,98	12,18	8,11	13358
Kepulauan Riau	76,46	70,50	12,99	10,37	14469
DKI Jakarta	81,65	73,32	13,08	11,31	18927
Jawa Barat	73,12	73,52	12,62	8,78	11277
Jawa Tengah	72,79	74,57	12,81	7,93	11377
DI Yogyakarta	80,64	75,08	15,65	9,75	14482
Jawa Timur	72,75	71,74	13,37	8,03	11992
Banten	73,32	70,39	13,05	9,13	12216
Bali	76,44	72,60	13,48	9,39	13942
Nusa Tenggara Barat	69,46	67,07	13,96	7,61	10681
Nusa Tenggara Timur	65,90	67,47	13,21	7,70	7877
Kalimantan Barat	68,63	71,02	12,66	7,59	9355
Kalimantan Tengah	71,63	71,04	12,75	8,65	11458
Kalimantan Selatan	71,84	69,13	12,82	8,46	12469
Kalimantan Timur	77,44	74,62	13,84	9,92	12641
Kalimantan Utara	71,83	72,67	13,06	9,27	9350
Sulawesi Utara	73,81	72,08	12,95	9,68	11179
Sulawesi Tengah	70,28	68,93	13,32	8,89	9696
Sulawesi Selatan	72,82	70,97	13,53	8,63	11430
Sulawesi Tenggara	72,23	71,37	13,69	9,25	9708
Gorontalo	69,81	68,51	13,12	8,02	10687
Sulawesi Barat	66,92	65,63	12,87	8,08	9358
Maluku	70,22	66,45	14,00	10,19	8876
Maluku Utara	69,47	68,79	13,73	9,24	8398
Papua Barat	65,89	66,46	13,21	7,84	8101
Papua	61,39	66,23	11,14	7,02	7146

Keterangan:

Y : Indeks Pembangunan Manusia

pan Hidup

ma Sekolah

ama Sekolah

n per Kapita

Lampiran 1. Data Indeks Pembangunan Manusia di Indonesia Tahun 2022 (lanjutan)

Provinsi	X_5	X_6	X_7	X_8
Aceh	98,3	3166460	83,10	71,16
Sumatera Utara	99,1	2522610	78,66	68,27
Sumatera Barat	99,3	2512539	83,71	68,38
Riau	99,2	2938564	77,32	63,87
Jambi	98,1	2698941	72,53	60,73
Sumatera Selatan	98,7	3144446	70,93	61,00
Bengkulu	97,8	2238094	79,31	66,61
Lampung	97,3	2440486	71,14	61,96
Kep. Bangka Belitung	98,2	3264884	68,42	59,65
Kepulauan Riau	99,0	3050172	84,54	73,54
DKI Jakarta	99,7	4641854	72,10	60,88
Jawa Barat	98,5	1841487	68,66	58,60
Jawa Tengah	94,3	1812935	70,82	61,17
DI Yogyakarta	95,2	1840916	89,95	74,50
Jawa Timur	93,3	1891567	73,40	62,10
Banten	98,2	2501203	69,22	59,54
Bali	95,5	2516971	83,84	74,73
Nusa Tenggara Barat	89,0	2207212	77,43	67,61
Nusa Tenggara Timur	94,6	1975000	75,55	56,00
Kalimantan Barat	94,0	2434328	68,72	51,87
Kalimantan Tengah	99,1	2922516	66,32	55,69
Kalimantan Selatan	98,4	2906473	69,88	59,61
Kalimantan Timur	99,0	3014497	81,43	69,10
Kalimantan Utara	97,7	3016738	76,50	65,65
Sulawesi Utara	99,8	3310723	74,33	63,30
Sulawesi Tengah	98,1	2390739	75,84	65,73
Sulawesi Selatan	93,3	3165876	70,81	60,44
Sulawesi Tenggara	95,8	2710596	74,53	64,11
Gorontalo	98,4	2800580	71,68	58,47
Sulawesi Barat	93,8	2678863	70,85	60,24
Maluku	99,4	2619313	79,03	64,57
Papua Barat	97,6	3200000	80,56	63,66
Papua	81,2	3561932	65,93	47,63

Keterangan:

X_5 : Angka Melek Huruf

X : Upah Minimum

sipasi Sekolah

sipasi Murni

Lampiran 2. Statistika Deskriptif

```
> #statistika deskriptif#
> summary(Data_IPM)
       Y               X1              X2              X3
 Min.   :61.39   Min.   :65.63   Min.   :11.14   Min.   : 7.020
 1st Qu.:70.23   1st Qu.:68.98   1st Qu.:12.83   1st Qu.: 8.088
 Median :72.19   Median :70.73   Median :13.16   Median : 8.835
 Mean   :71.97   Mean   :70.45   Mean   :13.24   Mean   : 8.839
 3rd Qu.:73.22   3rd Qu.:71.90   3rd Qu.:13.64   3rd Qu.: 9.360
 Max.   :81.65   Max.   :75.08   Max.   :15.65   Max.   :11.310
       X4              X5              X6
 Min.   : 7146   Min.   :81.20   Min.   :1812935
 1st Qu.: 9699   1st Qu.:95.28   1st Qu.:2435868
 Median :10990   Median :98.15   Median :2704768
 Mean   :11080   Mean   :96.70   Mean   :2729463
 3rd Qu.:11858   3rd Qu.:98.95   3rd Qu.:3041814
 Max.   :18927   Max.   :99.80   Max.   :4641854
       X7              X8
 Min.   :65.93   Min.   :47.63
 1st Qu.:70.83   1st Qu.:59.80
 Median :74.43   Median :62.70
 Mean   :75.14   Mean   :63.11
 3rd Qu.:78.94   3rd Qu.:66.39
 Max.   :89.95   Max.   :74.73
```

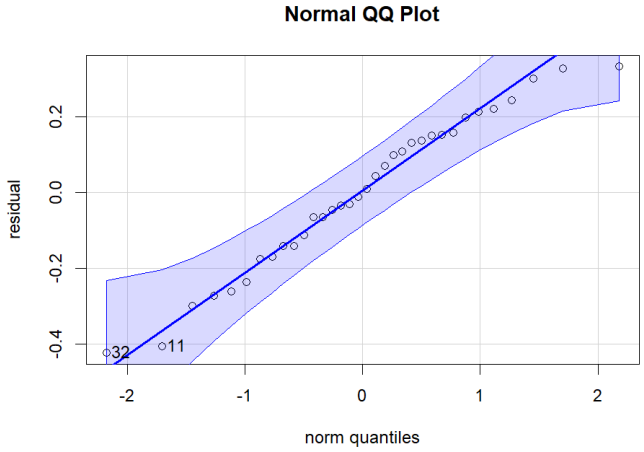
Lampiran 3. *Ordinary Least Square* (OLS)

```
> #model OLS#
> OLS <- lm(formula = Y~X1+X2+X3+X4+X5+X6+X7+X8, Data_IPM)
> summary(OLS)

Call:
lm(formula = Y ~ X1 + X2 + X3 + X4 + X5 + X6 + X7 + X8, data = Data_IPM)

Residuals:
     Min       1Q   Median       3Q      Max
-0.42186 -0.14129 -0.00111  0.15093  0.33168

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  9.353e-01  2.120e+00   0.441  0.66288
X1           5.087e-01  2.311e-02  22.008  < 2e-16 ***
X2           1.058e+00  1.009e-01  10.491 1.21e-10 ***
X3           9.999e-01  8.866e-02  11.278 2.68e-11 ***
X4           8.285e-04  2.854e-05  29.024  < 2e-16 ***
X5           3.184e-02  1.486e-02   2.143  0.04200 *
X6          -1.431e-07  1.018e-07  -1.405  0.17221
X7          -5.112e-02  1.933e-02  -2.645  0.01392 *
X8           6.851e-02  1.843e-02   3.718  0.00102 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.2354 on 25 degrees of freedom
Multiple R-squared:  0.9972,    Adjusted R-squared:  0.9964
F-statistic:  1129 on 8 and 25 DF,  p-value: < 2.2e-16
```

Lampiran 4. Pengujian Asumsi

1. Normalitas

```
> #asumsi klasik#
> #normalitas
> residual = residuals(OLS)
> ##uji shapiro wilk
> shapiro.test(residual)

        Shapiro-Wilk normality test

data:  residual
W = 0.9706, p-value = 0.4784
```



2. Heteroskedastisitas

```
> #heteroskedastisitas
> ##uji breusch pagan
> bptest(OLS)

        studentized Breusch-Pagan test

data:  OLS
BP = 10.822, df = 8, p-value = 0.212
```

3. Multikolinearitas

```
> #non-multikolinearitas
> vif(OLS)
       X1        X2        X3        X4        X5        X6
21736 3.986324 2.448343 1.774767 2.027788
       X8
69835
```

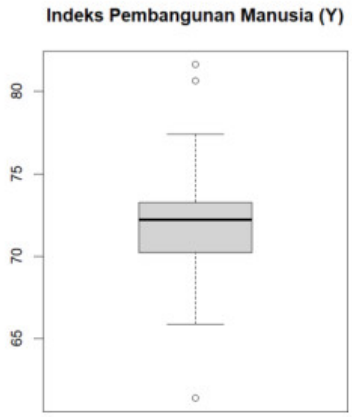
Lampiran 4. Pengujian Asumsi (lanjutan)

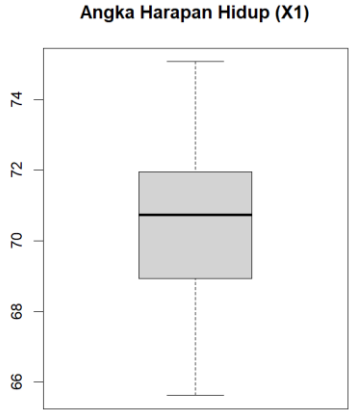
4. Autokorelasi

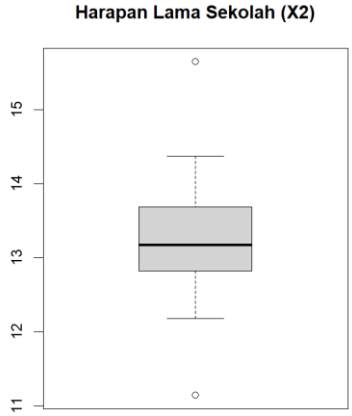
```
> #non-autokorelasi
> bgtest(OLS, order=k)

        Breusch-Godfrey test for serial correlation of
        order up to 8

data:  OLS
LM test = 11.988, df = 8, p-value = 0.1518
```

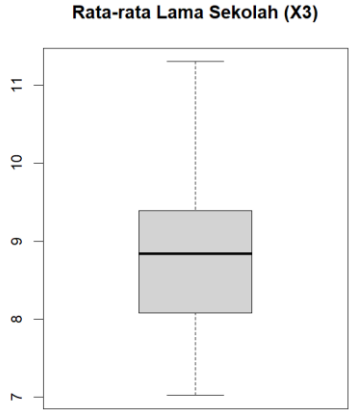
Lampiran 5. Pencilan dan Pengamatan Berpengaruh

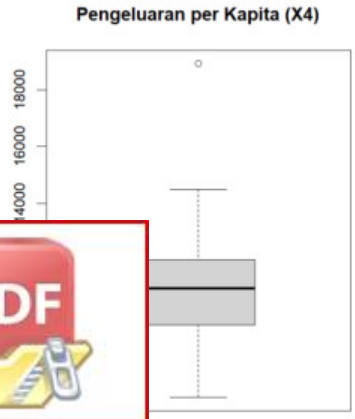
1. *Box Plot*

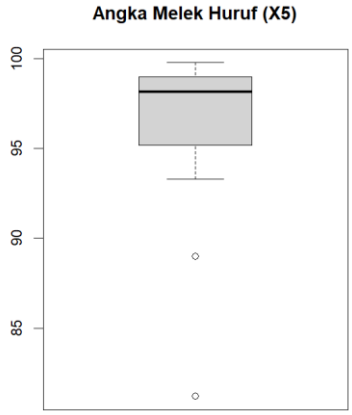




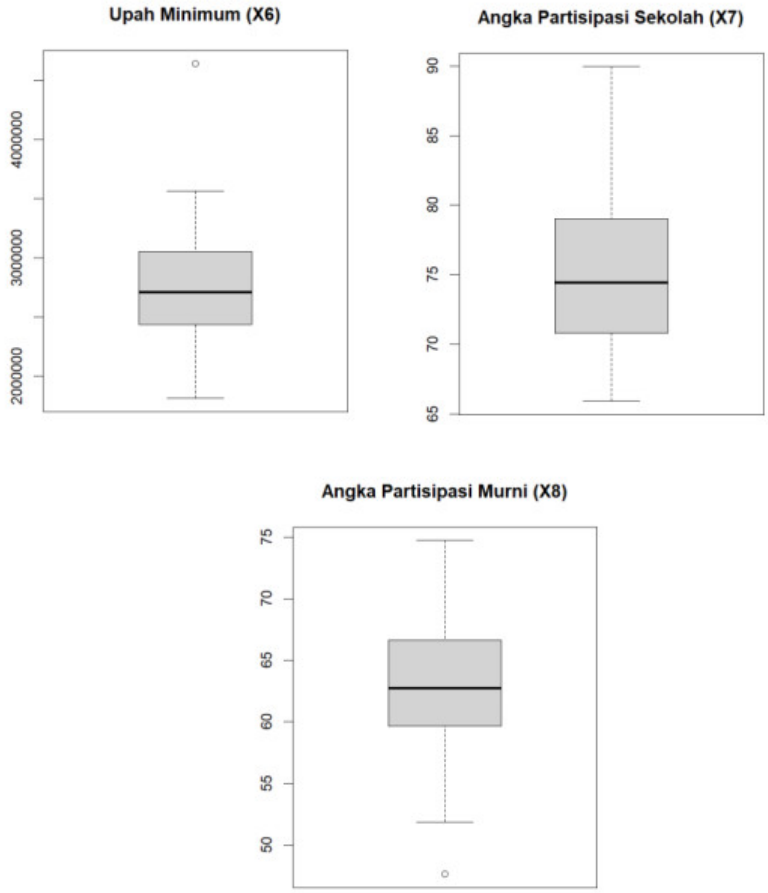








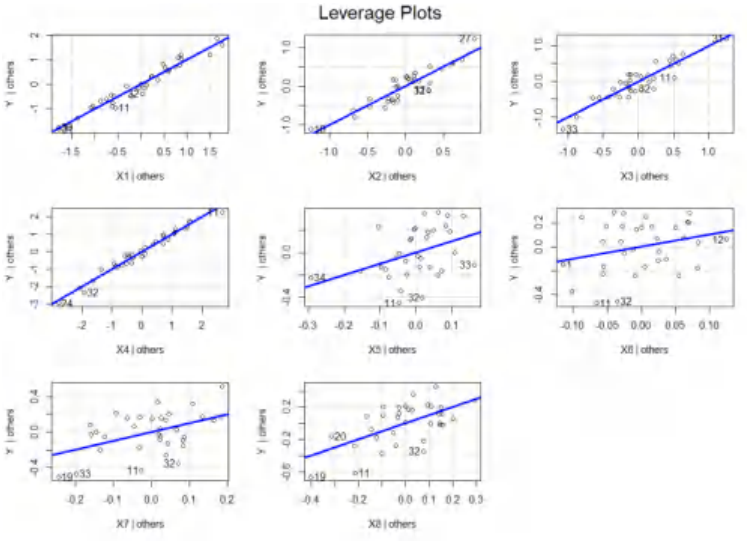
Lampiran 5. Pencilan dan Pengamatan Berpengaruh (lanjutan)



2. *Leverage Value*

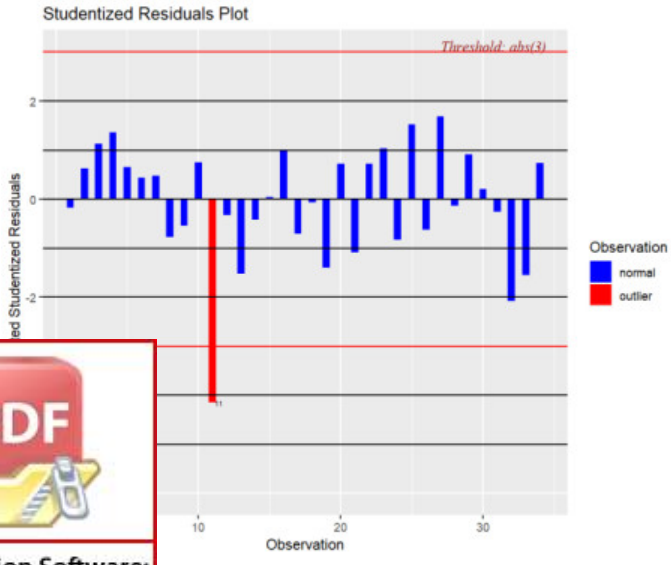
```
> #non-autokorelasi
> bgtest(OLS, order=k)

        Breusch-Godfrey test for serial correlation of
        order up to 8

data:  OLS
LM test = 11.988, df = 8, p-value = 0.1518
```

Lampiran 5. Pencilan dan Pengamatan Berpengaruh (lanjutan)



3. *Studentized Deleted Residual*

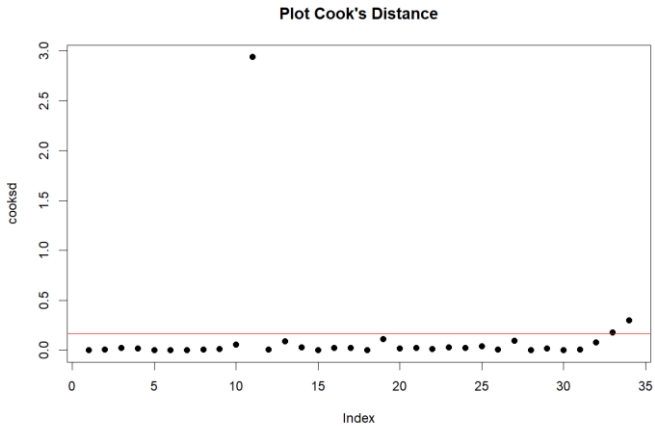
```
> ##studentized deleted residual
> t_i <- abs(as.data.frame(studres(OLS)))
> t_i <- abs(studres(OLS))
> t_i_df <- as.data.frame(t_i)
> dbg <- df.residual(OLS)  # Derajat kebebasan residual
> s_uji <- qt(0.025, df = dbg, lower.tail = FALSE)
> SDR <- t_i_df[which(t_i > s_uji), , drop = FALSE]
> SDR
        t_i
11 4.153565
32 2.081428
```



Lampiran 5. Pencilan dan Pengamatan Berpengaruh (lanjutan)

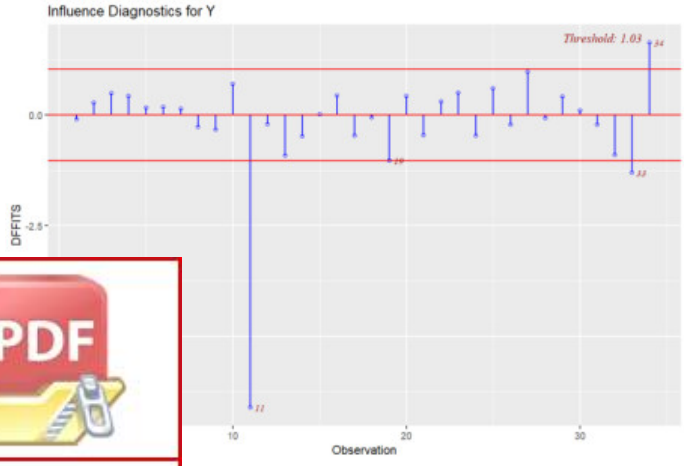
4. *Cook's Distance*

```
> #amatan berpengaruh
> ##cook's distance
> cooksd <- cooks.distance(OLS)
> s_uji = qf(0.05, df1 = k, df2 = n-p, lower.tail = FALSE)
> cooksd [which((cooksd)>s_uji)]
      11
2.941485
```



5. DFFITS

```
> ##DFFITS
> dffits <- abs(dffits(OLS))
> s_uji = 2*sqrt(p/n)
> dffits[which(dffits > s_uji)]
      11       19       33       34
6.609332 1.036917 1.304218 1.626394
```



Lampiran 6. Pendugaan Parameter Model Regresi *Robust* LMS

LMS: The 22th ordered squared residual will be minimized

Least Median of Squares (LMS) Method

Minimizing 22th Ordered Squared Residual

There are 52451256 subsets

Highest Possible Breakdown Value = 38.24 %

Random Selection of 3000 Subsets

RLS Parameter Estimates Based on LMS						
Variable	Estimate	Approx Std Err	t Value	Pr > |t|	Lower WCI	Upper WCI
VAR1	0.4773025	0.01162619	41.05	<.0001	0.45451558	0.50008942
VAR2	1.28008373	0.05176855	24.73	<.0001	1.17861923	1.38154822
VAR3	1.22477738	0.04943283	24.78	<.0001	1.1278908	1.32166395
VAR4	0.00090568	0.00001768	51.22	<.0001	0.00087103	0.00094033
VAR5	0.02250944	0.00693387	3.25	0.0042	0.00891929	0.03609958
VAR6	-8.5266E-8	5.26686E-8	-1.62	0.1219	-1.8849E-7	1.79629E-8
VAR7	-0.0339324	0.01014359	-3.35	0.0034	-0.0538134	-0.0140513
VAR8	0.00631664	0.01127126	0.56	0.5817	-0.0157746	0.0284079
Intercep	0.86445134	1.00181835	0.86	0.3990	-1.0990766	2.82797923

Weighted Sum of Squares = 0.1939191519

Degrees of Freedom = 19

RLS Scale Estimate = 0.1010260915

Weighted R-squared = 0.9993191849

F (8,19) Statistic = 3486.0906501

Probability = 2.058828E-28

There are 28 points with nonzero weight

Average Weight = 0.8235294118

Lampiran 7. Pemilihan Model Terbaik

Best Subsets Regression: y versus x1; x2; x3; x4; x5; x7

Response is y

Vars	R-Sq	R-Sq (adj)	R-Sq (pred)	Mallows Cp	S	x 1	x 2	x 3	x 4	x 5	x 7
1	77,1	76,3	71,9	1251,2	1,8973				X		
1	61,6	60,4	54,9	2114,5	2,4546	X					
2	88,8	88,1	86,6	597,1	1,3464		X		X		
2	87,6	86,8	80,8	662,1	1,4147			X	X		
3	96,1	95,7	94,3	194,3	0,81248	X	X		X		
3	95,7	95,2	92,7	216,6	0,85269	X		X	X		
4	99,4	99,3	98,6	9,5	0,32231	X	X	X	X		
4	97,7	97,3	96,0	106,9	0,63699	X		X	X		X
5	99,5	99,4	98,8	5,1	0,29522	X	X	X	X	X	
5	99,4	99,3	98,4	11,5	0,32802	X	X	X	X		X
6	99,5	99,4	98,6	7,0	0,29984	X	X	X	X	X	X

Lampiran 8. Pendugaan Parameter Model Regresi *Robust* LMS Terbaik

LMS: The 20th ordered squared residual will be minimized

Least Median of Squares (LMS) Method

Minimizing 20th Ordered Squared Residual

There are 1344904 subsets of 6 cases out of 34 cases

Highest Possible Breakdown Value = 44.12 %

Random Selection of 3000 Subsets

RLS Parameter Estimates Based on LMS						
Variable	Estimate	Approx Std Err	t Value	Pr > |t|	Lower WCI	Upper WCI
VAR1	0.47389541	0.00740502	64.00	<.0001	0.45938184	0.48840898
VAR2	0.97907391	0.02790572	35.09	<.0001	0.92437972	1.03376811
VAR3	1.16636157	0.035085	33.24	<.0001	1.09759623	1.23512691
VAR4	0.00089296	0.00001218	73.29	<.0001	0.00086908	0.00091684
VAR5	0.0454572	0.00959985	4.74	0.0002	0.02664185	0.06427256
Intercep	1.13994322	1.14027496	1.00	0.3323	-1.0949546	3.37484107

Weighted Sum of Squares = 0.0611232475

Degrees of Freedom = 16

RLS Scale Estimate = 0.0618077905

Weighted R-squared = 0.9996543773

F (5,16) Statistic = 9255.4513245

Probability = 4.303261E-27

There are 22 points with nonzero weight

Average Weight = 0.6470588235