

LAMPIRAN 1

OUTPUT NILAI KOEFISIEN REGRESI

* * * * MULTIPLE REGRESSION * * * *

Listwise Deletion of Missing Data .

Equation Number 1 Dependent Variable.. DAYNALAR skor daya nalar

Block Number 1. Method: Enter UMURANAK

Variable(s) Entered on Step Number
1.. UMURANAK umur anak berucap pertama kali

Multiple R .64029
R Square .40997
Adjusted R Square .37892
Standard Error 11.02291

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	1604.08089	1604.08089
Residual	19	2308.58578	121.50451

F = 13.20182 Signif F = .0018

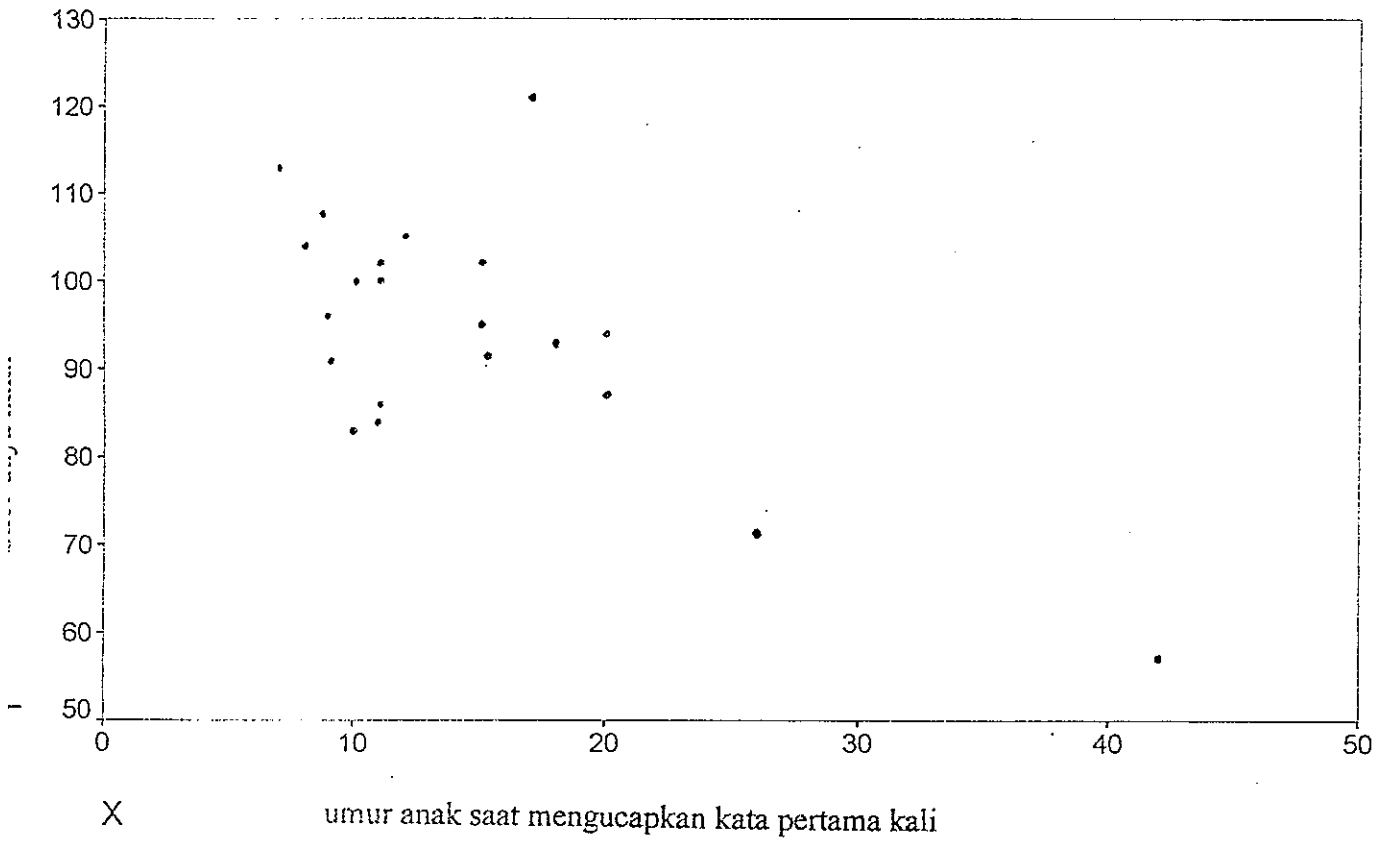
----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
UMURANAK	-1.126989	.310172	-.640290	-3.633	.0018
(Constant)	109.873841	5.067802		21.681	.0000

End Block Number 1 All requested variables entered.

LAMPIRAN 2

DIAGRAM PENCAR
SKOR DAYA NALAR DAN UMUR ANAK SAAT MENGUCAPKAN
KATA - KATAPERTAMA KALI



LAMPIRAN 3

HASIL PERHITUNGAN UNTUK NILAI PENDUGAAN, SISAAN DAN SISAAN MUTLAK

i	x_i	y_i	\hat{y}_i	e_i	$ e_i $	i	x_i	y_i	\hat{y}_i	e_i	$ e_i $
1.	15	95	92,97	2,03	2,03	12.	9	96	99,75	-3,75	3,75
2.	26	71	80,54	-9,54	9,54	13.	10	83	98,62	-15,62	15,62
3.	10	83	98,62	-15,62	15,62	14.	11	84	97,49	-13,49	13,49
4.	9	91	99,75	-8,75	8,75	15.	11	102	97,49	4,51	4,51
5.	15	102	92,97	9,03	9,03	16.	10	100	98,62	1,38	1,38
6.	20	87	87,32	-0,32	0,32	17.	12	105	96,36	8,64	8,64
7.	18	93	89,58	3,47	3,42	18.	42	57	62,46	-5,46	5,46
8.	11	100	97,49	2,51	2,51	19.	17	121	90,71	30,29	30,29
9.	8	104	100,88	3,12	3,12	20.	11	86	97,49	-11,49	11,49
10.	20	94	87,32	6,68	6,68	21.	10	100	98,62	1,38	1,38
11.	7	113	102,01	10,99	10,99						

Tabel 2.2. Skor daya nalar (Y) dan umur anak saat mengucapkan kata pertama kali
(X, dalam bulan)

LAMPIRAN 4

OUTPUT NILAI KOEFISIEN REGRESI DARI DATA TABEL 3.5.1

04 Nov 99 SPSS for MS WINDOWS Release 6.0

***** MULTIPLE REGRESSION *****

Listwise Deletion of Missing Data

Equation Number 1 Dependent Variable.. Y Jumlah Tenaga Kerja Perjam Setia

Block Number 1. Method: Enter
 X1 X2 X3 X4 X5 X6 X7

Variable(s) Entered on Step Number
 1.. X7 Jumlah Ruangan yang Dipakai
 2.. X3 Pelayanan operasional setiap minggu
 3.. X4 Areal Lokasi yang Digunakan
 4.. X1 Rata-rata menginap harian
 5.. X5 Jumlah Pembuatan Perlengkapan Perwira
 6.. X2 Jumlah pendaftaran masuk setiap bulan
 7.. X6 Kapasitas Tempat Tidur yang digunakan

Multiple R .98044
 R Square .96126
 Adjusted R Square .94531
 Standard Error 455.16727

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	7	87387188.13704	12483884.01958
Residual	17	3522013.12053	207177.24238

F = 60.25742 Signif F = .0000

----- Variables in the Equation -----

Variable	B	SE B	Beta	T	Sig T
X1	-1.283767	.804691	-.112003	-1.595	.1291
X2	1.803510	.516236	.354729	3.494	.0028
X3	.669150	1.846399	.020156	.362	.7215
X4	-21.422630	10.171599	-.153559	-2.106	.0504
X5	5.619226	14.746094	.034770	.381	.7079
X6	-14.480251	4.220177	-.998090	-3.431	.0032
X7	29.324751	6.365904	1.755249	4.607	.0003
(Constant)	134.967902	237.814296		.568	.5778

LAMPIRAN 5

TABEL NILAI KRITIS UNTUK UJI OUTLIER

TABLE C.4 Continued
Critical values for the outlier test using the R-student statistic*

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	20	25	30	
6	7.53	10.87	14.46	19.20															
7	6.35	7.84	11.45	16.43	445.6														
8	5.71	6.54	8.12	11.98	32.26	507.3													
9	5.31	5.84	6.71	8.38	12.47	19.97	533.0												
10	5.04	5.41	5.96	6.87	8.61	12.92	31.60	636.6											
11	4.85	5.12	5.50	6.07	7.01	8.83	13.35	33.34	700.3										
12	4.71	4.91	5.19	5.58	6.17	7.15	9.03	13.75	34.62	763.9									
13	4.60	4.76	4.97	5.25	5.66	6.26	7.27	9.22	14.12	16.03	837.6								
14	4.51	4.64	4.81	5.02	5.32	5.73	6.35	7.35	9.50	14.48	31.40	891.3							
15	4.44	4.55	4.68	4.85	5.08	5.37	5.80	6.43	7.50	9.57	14.82	38.71	954.9						
16	4.38	4.48	4.59	4.72	4.90	5.12	5.43	5.86	6.51	7.60	9.73	15.15	39.98						
17	4.34	4.41	4.51	4.62	4.76	4.94	5.17	5.48	5.92	7.00	9.88	15.46	41.21						
18	4.30	4.36	4.44	4.54	4.66	4.80	4.98	5.21	5.53	5.98	6.66	7.80	10.03	15.76	42.41				
19	4.26	4.32	4.39	4.47	4.57	4.68	4.83	5.01	5.25	5.53	6.03	6.72	7.89	10.17	16.05				
20	4.23	4.29	4.35	4.42	4.50	4.60	4.72	4.86	5.05	5.29	5.62	6.08	7.08	10.33	16.33				
21	4.21	4.26	4.31	4.37	4.44	4.52	4.62	4.74	4.89	5.08	5.33	5.66	6.13	6.85	8.06				
22	4.19	4.23	4.28	4.33	4.39	4.46	4.55	4.65	4.73	4.92	5.11	5.36	5.70	6.18	6.91				
23	4.17	4.21	4.25	4.30	4.35	4.41	4.49	4.57	4.67	4.80	4.95	5.14	5.40	5.74	6.22	47.94			
24	4.15	4.19	4.22	4.27	4.32	4.37	4.43	4.51	4.59	4.70	4.82	4.98	5.17	5.43	5.78	12.36			
25	4.14	4.17	4.20	4.24	4.28	4.33	4.39	4.45	4.53	4.62	4.72	4.85	5.00	5.20	5.46	10.92			
26	4.12	4.15	4.18	4.22	4.26	4.30	4.35	4.41	4.47	4.55	4.64	4.74	4.87	5.03	5.23	8.43			
27	4.11	4.14	4.17	4.20	4.24	4.27	4.32	4.37	4.43	4.49	4.57	4.66	4.76	4.89	5.05	7.17			
28	4.10	4.13	4.15	4.18	4.21	4.25	4.29	4.33	4.38	4.44	4.51	4.59	4.68	4.78	4.91	6.43			
29	4.09	4.12	4.14	4.17	4.20	4.23	4.26	4.30	4.35	4.40	4.46	4.53	4.60	4.69	4.80	5.94			
30	4.09	4.11	4.13	4.15	4.18	4.21	4.24	4.28	4.32	4.36	4.42	4.47	4.54	4.62	4.71	5.60			
31	4.08	4.10	4.12	4.14	4.17	4.19	4.22	4.26	4.29	4.33	4.38	4.43	4.49	4.56	4.64	5.35			
32	4.07	4.09	4.11	4.13	4.15	4.18	4.21	4.24	4.28	4.31	4.35	4.39	4.45	4.50	4.57	5.16			
33	4.07	4.08	4.10	4.12	4.14	4.17	4.19	4.22	4.25	4.28	4.32	4.36	4.41	4.46	4.53	5.01			
34	4.06	4.08	4.09	4.11	4.13	4.15	4.18	4.20	4.23	4.26	4.29	4.33	4.37	4.42	4.47	4.89			
35	4.06	4.07	4.09	4.11	4.12	4.14	4.16	4.19	4.21	4.24	4.27	4.31	4.34	4.39	4.43	4.79			
36	4.05	4.07	4.08	4.10	4.12	4.13	4.15	4.18	4.20	4.22	4.25	4.28	4.32	4.36	4.40	4.71			
37	4.05	4.06	4.08	4.09	4.11	4.13	4.14	4.16	4.19	4.21	4.24	4.26	4.29	4.33	4.37	4.71			
38	4.05	4.06	4.07	4.09	4.10	4.12	4.13	4.15	4.17	4.20	4.22	4.25	4.27	4.31	4.34	4.69			
39	4.04	4.06	4.07	4.08	4.10	4.11	4.13	4.14	4.16	4.18	4.21	4.23	4.26	4.28	4.32	4.54			
40	4.04	4.05	4.06	4.08	4.09	4.11	4.12	4.14	4.15	4.17	4.19	4.22	4.24	4.27	4.29	4.54			
50	4.03	4.03	4.04	4.05	4.06	4.07	4.08	4.09	4.10	4.11	4.12	4.13	4.14	4.15	4.16	4.28			
60	4.03	4.03	4.04	4.04	4.05	4.05	4.06	4.06	4.07	4.08	4.08	4.09	4.10	4.11	4.12	4.25			
70	4.03	4.04	4.04	4.04	4.05	4.05	4.06	4.06	4.06	4.07	4.07	4.08	4.08	4.09	4.10	4.22			
80	4.04	4.04	4.04	4.05	4.05	4.05	4.06	4.06	4.06	4.07	4.07	4.08	4.08	4.09	4.10	4.22			
90	4.05	4.05	4.05	4.05	4.05	4.06	4.06	4.06	4.07	4.07	4.07	4.08	4.08	4.09	4.10	4.22			
100	4.06	4.06	4.06	4.06	4.06	4.07	4.07	4.07	4.07	4.08	4.08	4.08	4.09	4.10	4.11	4.22			
200	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.15	4.16			
300	4.21	4.21	4.21	4.21	4.21	4.21	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22	4.22			
400	4.26	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27	4.27			
500	4.31	4.31	4.31	4.31	4.31	4.31	4.31	4.31	4.31	4.31	4.31	4.31	4.31	4.31	4.31	4.31			

n is the sample size, p is the total number of parameters in the model.

*Used with permission. Sanford Weisberg, *Applied Linear Regression*, (New York: John Wiley and Sons, 1980), pp. 264-267.

Lampiran 6

Program Perhitungan Koefisien Regresi Robust

```
program tugas_akhir;

uses crt,dos,math,printer;

const maxdata = 25;

type
  Ffile = file of real;
  matrik1 = array[1..maxdata,1..maxdata] of real;
  matrik2 = array[1..maxdata] of real;
  matrik3 = array[0..7] of real;

var
  vfile1 : Ffile;
  vfile2 : Ffile;
  vfile3 : Ffile;
  vfile4 : text;
  i,j,k,l,m,n : integer;
  counter      : integer;
  mxt,nxt,nx,
  mw,nw       : integer;
  y_aprox,Snol: real;
  terus       : integer;
  median      : real;
  X,XA        : matrik1;
  bnol,y,error: matrik2;
  C           : matrik3;
  error_t     : real;
  w,error1    : matrik2;
  matrik_w,BR : matrik1;
  XT,X_one,XW,
  X_two,XTWX  : matrik1;
  XTWXInv,MY  : matrik1;
```

```
procedure Kali(D,E:matrikl;var
F:matrikl;m1,n1,p1:integer);
var i,j,k : integer;
begin
  for i:=1 to m1 do
    for j:=1 to p1 do
      begin
        F[i,j]:=0.;
        for k:=1 to n1 do
          F[i,j] := F[i,j] + D[i,k]*E[k,j];
        end;
      end;
    end;
  end;
```

```
procedure tranpose(D:matrikl;var
E:matrikl;m1,n1:integer);
var i,j : integer;

begin
  for i:=1 to n1 do
    for j:=1 to m1 do
      E[i,j] := D[j,i];
    end;
  end;
```

```
procedure Cetak(A:matrikl;m1,n1:integer);
var i,j : integer;
begin
  for i:=1 to m1 do
    begin
      for j:=1 to n1 do
        begin
          write(vfile4,A[i,j]:10:5)
        end;
        writeln(vfile4);
      end;
    end;
  end;
```

```
Procedure QuickSort(var A:matrik2;Lo,Hi:Integer);
```

```
Procedure Sort(l, r: Integer);
var
  i, j : integer;
  x,y : real;
```



```
begin
  i := 1; j := r; x := a[(1+r) DIV 2];
  repeat
    while a[i] < x do i := i + 1;
    while x < a[j] do j := j - 1;
    if i <= j then
      begin
        y := a[i]; a[i] := a[j]; a[j] := y;
        i := i + 1; j := j - 1;
      end;
    until i > j;
    if l < j then Sort(l, j);
    if i < r then Sort(i, r);
  end;

begin {QuickSort};
  Sort(Lo,Hi);
end;

Function shee(e:real):real;
const c = 1.;
var temp : real;
begin
  if abs(e) <= c then temp := e
  else if e > c then temp := c
  else temp := -c;
  shee:=temp;
end;

{main program}
Begin
  clrscr;
  assign(vfile1,'c:\atin\program\bnol.dat');
  reset(vfile1);
  assign(vfile2,'c:\atin\program\datax.dat');
  reset(vfile2);
  assign(vfile3,'c:\atin\program\datay.dat');
  reset(vfile3);
  assign(vfile4,'c:\atin\program\hasil2.dat');
  rewrite(vfile4);

  m:=25;
  n:=7;
```

```
{mengambil elemen b_nol}
i:=0;
while i<8 do
begin
  read(vfile1,bnol[i]);
  inc(i);
end;

{ambil elemen X[i,j]}
for i:=1 to m do
  for j:=1 to n do
    read(vfile2,X[i,j]);

{mengambil elemen y}
i:=1;
while i<26 do
begin
  read(vfile3,y[i]);
  inc(i);
end;

{memulai perhitungan regresi}
terus := 1;
while terus <= 9 do
begin
  counter := 1;
  while counter <= maxdata do
  begin
    {membuat elemen regresi dari data x}
    C[0]:=1;
    for i:=1 to 7 do C[i] := X[counter,i];
    {persamaan regresi}
    y_aprox := 0;
    for i:=0 to 7 do
    begin
      y_aprox := y_aprox + (bnol[i]*C[i]);
    end;

    {menghitung error}
    error[counter] := y[counter] - y_aprox;
    error1[counter]:=abs(error[counter]);
    inc(counter);
  end;

  {sorting nilai sisaan}
  QuickSort(error1,1,maxdata);
```

```

{menghitung nilai median dan Snol}
median := error1[13];
Snol := 1.5 * (median);

{menghitung nilai wi}
for i:= 1 to 25 do
begin
  error_t := error[i] / Snol;
  w[i] := shee(error_t)/error_t;
end;

{membuat matrik W dengan elemen diagonal wi}
for i:=1 to 25 do
  for j:=1 to 25 do
  begin
    if i=j then matrik_w[i,j] := w[i]
    else matrik_w[i,j] := 0.;
  end;

mw:=m;
nw:=mw;

{penambahan kolom satuan}
nx := n+1;
for i := 1 to m do
  for j := 1 to n+1 do
    if j = 1 then XA[i,j]:=1.
    else XA[i,j] := X[i,j-1];

{tranpose matrik X yang baru}
Tranpose(XA,XT,m,nx);
mxt:=nx;
nxt:=m;

{perkalian matrik (X'WoX)}
Kali(XT,matrik_w,XW,mxt,nxt,mw);
Kali(XW,XA,XTWX,mxt,nxt,nx);

{mencari invers}
for i:=1 to mxt do
  for j:=1 to nx do
    A[i,j]:=XTWX[i,j];
Invers(A,B,nx);
for i:=1 to mxt do
  for j:=1 to nx do
    XTWXInv[i,j]:=B[i,j];

```

```
for i:=1 to 25 do
  for j:=1 to 1 do
    MY[i,j]:=y[i];

    {perkalian matrik (X'WoY)}
    Kali(matrik_w,MY,X_one,mw,nw,1);
    Kali(XT,X_one,X_two,mxt,nxt,1);
    Kali(XTWXInv,X_two,BR,mxt,mxt,1);

    {cetak hasil regresi}
    writeln(vfile4,'koefisien regresi robust (bRo)');
    writeln(vfile4);
    Cetak(BR,mxt,1);

    {set BRo menjadi bnol untuk iterasi berikutnya}
    for i:=1 to 8 do
      for j := 1 to 1 do
        bnol[i-1] := BR[i,j];

      terus := terus + 1;
    end;

    close(vfile1);
    close(vfile2);
    close(vfile3);
    close(vfile4);
  end.
```


Lampiran 8

OUTPUT HASIL PERHITUNGAN KOEFISIEN REGRESI ROBUST

- iterasi ke- 1

nilai median = 184.3264
nilai Snol = 276.4895

koefisien regresi robust (bRo)

140.32291
-1.46764
2.07494
0.42421
-18.74281
1.81304
-13.44116
27.90847

- iterasi ke- 2

nilai median = 175.2337
nilai Snol = 262.8506

koefisien regresi robust (bRo)

137.05861
-1.56468
2.26161
0.41268
-17.82325
0.00811
-13.48626
27.75281

- iterasi ke- 3

nilai median = 156.7623
nilai Snol = 235.1434

koefisien regresi robust (bRo)

128.90433
-1.62761
2.36330
0.44254
-16.84892
-1.20185
-13.69019
27.83401

- iterasi ke- 4

nilai median = 137.7265
nilai Snol = 206.5897

koefisien regresi robust (bRo)

120.79167
-1.66808
2.41187
0.47519
-16.35091
-2.16345
-13.85023
27.98610

- iterasi ke- 5

nilai median = 126.6456
nilai Snol = 189.9683

koefisien regresi robust (bRo)

115.92114
-1.69041
2.43526
0.49435
-16.08866
-2.72010
-13.94261
28.08785

- iterasi ke- 6

nilai median = 117.9230
nilai Snol = 176.8844

koefisien regresi robust (bRo)

112.42857
-1.70580
2.44941
0.50636
-15.91894
-3.11633
-14.00435
28.16441

- iterasi ke- 7

nilai median = 111.3797

nilai Snol = 167.0695

koefisien regresi robust (bRo)

109.86920

-1.71689

2.45904

0.51484

-15.79983

-3.40541

-14.04820

28.22124

- iterasi ke- 8

nilai median = 106.5799

nilai Snol = 159.8699

koefisien regresi robust (bRo)

108.21348

-1.72516

2.46515

0.52583

-15.73601

-3.61902

-14.08148

28.26548

iterasi ke- 9

nilai median = 103.1604
nilai Snol = 154.7407

koefisien regresi robust (bRo)

107.73540
-1.73117
2.46923
0.53131
-15.70037
-3.77556
-14.10679
28.29990

iterasi ke-10

nilai median = 100.5893
nilai Snol = 150.8840

koefisien regresi robust (bRo)

107.58227
-1.73568
2.47211
0.53468
-15.67769
-3.89350
-14.12620
28.32680

iterasi ke-11

nilai median = 98.6204
nilai Snol = 147.9306

koefisien regresi robust (bRo)

107.52209
-1.73913
2.47425
0.53704
-15.66163
-3.98363
-14.14111
28.34764

iterasi ke-12

nilai median = 97.1062
nilai Snol = 145.6593

koefisien regresi robust (bRo)

107.68243
-1.74179
2.47585
0.53771
-15.64944
-4.05333
-14.15261
28.36384