Lampiran I

Penyelesaian dengan software minitab

```
MTB > retr'b:awal1'
 WORKSHEET SAVED 12/ 2/1994
 Worksheet retrieved from file: b:awal1.MTW
MTB > name c1='x1' c2='x2' c3='x3' c4='x4'
MTB > name c5='y'
MTB > print c1-c5
```

ROW	x1	x2	x3	x4	y
1	217	67	260	91	481
2	141	52	190	66	292
3	152	58	203	68	338
4	153	56	183	70	357
5	180	66	170	77	396
6	193	71	178	82	429
7	162	65	160	74	345
8	180	80	170	84	469
9	205	77	188	83	425
10	168	74	170	79	358
11	232	65	220	72	393
12	146	68	158	68	346
13	173	51	243	56	279
14	155	64	198	59	311
15	212	66	220	77	401
16	138	70	180	62	267
17	147	54	150	75	404
18	197	76	228	88	442
19	165	59	188	70	368
20	125	58	160	66	295
21	161	52	190	69	391
22	132	62	163	59	264
23	257	64	313	96	487
24	236	72	225	84	481
25	149	57	173	68	374
26	161	57	173	65	309
27	198	59	220	62	367
28	245	70	218	69	469
29	141	63	193	60	252
30	177	53	183	75	338

```
MTB > regres c5 on 4 pred c1-c4;
SUBC> hi put into c6;
SUBC> residual put into c7;
SUBC> tresidual put into c8;
SUBC> cookd put into c21.
```

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The regression equation is

x5 = - 3.6 + 1.27 x1 - 0.525 x2 - 0.505 x3 + 3.90 x4

Predictor	Coef	Stdev	t-ratio	p
Constant	-3.62	56.10	-0.06	0.949
x1	1.2676	0.2869	4.42	0.000
x2	-0.5252	0.8628	-0.61	0.548
x3	-0.5050	0.2459	-2.05	0.051
x4	3.9030	0.7477	5.22	0.000

s = 28.67 R-sq = 85.3% R-sq(adj) = 83.0%

Analysis of Variance

SOURCE	DF	SS	MS	F	p
Regression	4	119361	29840	36.30	0.000
Error	25	20551	822		
Total	29	139912			

SOURCE	DF	SEQ SS
x1	1	89117
x2	1	4680
x3	1	3165
x4	1	22399

Unusual Observations

Obs.	x1	x5	Fit	Stdev.Fit	Residual	St.Resid
23	257	487.00	505.17	20.54	-18.17	-0.91 X
30	177	338.00	393.22	12.60	-55.22	-2.14R

R denotes an obs. with a large st. resid.
X denotes an obs. whose X value gives it large influence.

```
MTB > nscore c7 c22
MTB > name c6='pii' c7='ei' c8='ri' c21='a'
MTB > name c22='nscore'
MTB > let c9=c5-c7
MTB > name c9='est y'
MTB > print c6-c9 c22
```

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ROW	pii	ei	ri	est y	nscore
1	0.249406	20.8626	0.83477	460.137	0.77339
2	0.126216	-17.4516	-0.64348	309.452	-0.38042
3	0.090372	16.5149	0.59610	321.485	0.56567
4	0.078674	15.2904	0.54777	341.710	0.47097
5	0.090342	-8.5700	-0.30767	404.570	-0.20775
6	0.110428	-4.8981	-0.17759	433.898	0.04126
7	0.084317	-30.6190	-1.12176	375.619	-1.17480
8	0.220586	44.4618	1.83819	424.538	1.61158
9	0.146796	-19.8112	-0.74129	444.811	-0.77339
10	0.128571	-34.9628	-1.32595	392.963	-1.61158
11	0.213533	-33.2460	-1.32729	426.246	-1.36095
12	0.099290	14.6468	0.53048	331.353	0.29296
13	0.297564	-5.7448	-0.23451	284.745	-0.04126
14	0.161600	21.4653	0.81205	289.535	0.89091
15	0.070425	-18.8831	-0.67563	419.883	-0.66586
16	0.231465	-18.6332	-0.73446	285.633	-0.56567
17	0.248152	32.6650	1.33426	371.335	1.02244
18	0.226653	7.4904	0.29159	434.510	0.12406
19	0.046602	15.1795	0.53441	352.820	0.38042
20	0.113993	-6.1689	-0.22420	301.169	-0.12406
21	0.119332	44.4867	1.71654	346.513	2.04332
22	0.121710	-15.1053	-0.55432	279.105	-0.29296
23	0.513319	-18.1672	-0.90498	505.167	-0.47097
24	0.143195	9.0489	0.33485	471.951	0.20775
25	0.072146	40.6420	1.50867	333.358	1.36095
26	0.084478	-27.8606	-1.01623	336.861	-1.02244
27	0.166969	19.7325	0.74736	347.268	0.66586
28	0.387501	39.5998	1.84806	429.400	1.17480
29	0.163369	-26.7412	-1.02052	278.741	-0.89091
30	0.192994	-55.2235	-2.32538	393.223	-2.04332

```
MTB > let c30=c7**2
MTB > sum c30 k30
   SUM      =        20551
MTB > let c10=c6+(c30/k30)
MTB > name c10='pzii'
MTB > print c6 c10 c21
```

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ROW	pii	pzii	Ci
1	0.249406	0.270584	0.046877
2	0.126216	0.141035	0.012249
3	0.090372	0.103643	0.007247
4	0.078674	0.090051	0.005272
5	0.090342	0.093916	0.001951
6	0.110428	0.111595	0.000815
7	0.084317	0.129935	0.022937
8	0.220586	0.316777	0.174641
9	0.146796	0.165894	0.019256
10	0.128571	0.188051	0.050352
11	0.213533	0.267315	0.092835
12	0.099290	0.109729	0.006388
13	0.297564	0.299170	0.004842
14	0.161600	0.184020	0.025772
15	0.070425	0.087775	0.007070
16	0.231465	0.248359	0.033103
17	0.248152	0.300070	0.113960
18	0.226653	0.229383	0.005173
19	0.046602	0.057814	0.002874
20	0.113993	0.115844	0.001344
21	0.119332	0.215631	0.074084
22	0.121710	0.132813	0.008759
23	0.513319	0.529378	0.174022
24	0.143195	0.147179	0.003886
25	0.072146	0.152519	0.033677
26	0.084478	0.122248	0.019034
27	0.166969	0.185915	0.022793
28	0.387501	0.463805	0.394075
29	0.163369	0.198164	0.040606
30	0.192994	0.341385	0.219871

```
MTB > let c11=c7**2
MTB > name c11='ei^2'
MTB > sum c11 k1
   SUM      =        20551
MTB > let c12=c6+c11/k1
MTB > name c12='Api'
MTB > let c13=c8**2
MTB > name c13='ri^2'
MTB > let c14=(30-5-c13)
MTB > let c15=(c14/24)
MTB > raise c15 5,c16
MTB > let c17=c16/(1-c6)
MTB > name c17='VRi'
MTB > let k2=3.85/3.9
MTB > logten of k2 put into k3
    ANSWER =          -0.0056
```

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```
MTB > let k4=5/2*k3
MTB > let c18=(24/(25-c13))
MTB > logten of c18 put into c19
MTB > let c20=5/2*c19
MTB > let c21=1-c6
MTB > logten of c21 put into c22
MTB > let c23=c22/2
MTB > let c24=c23+c20+k4
MTB > name c24='CWi'
MTB > print c12 c17 c24
```

ROW	Api	VRi	CWi
1	0.270584	1.41857	-0.089936
2	0.141035	1.29114	-0.069497
3	0.103643	1.25515	-0.063357
4	0.090051	1.25317	-0.063015
5	0.093916	1.32290	-0.074774
6	0.111595	1.37000	-0.082371
7	0.129935	1.03455	-0.021386
8	0.316777	0.76131	0.045211
9	0.165894	1.28626	-0.068674
10	0.188051	0.97739	-0.009043
11	0.267315	1.08214	-0.031152
12	0.109729	1.28670	-0.068749
13	0.299170	1.72685	-0.132637
14	0.184020	1.27981	-0.067583
15	0.087775	1.20322	-0.054182
16	0.248359	1.43091	-0.091816
17	0.300070	1.12746	-0.040060
18	0.229383	1.55909	-0.110446
19	0.057814	1.21456	-0.056220
20	0.115844	1.37037	-0.082428
21	0.215631	0.74390	0.050232
22	0.132813	1.31266	-0.073085
23	0.529378	2.13340	-0.178545
24	0.147179	1.39959	-0.087010
25	0.152519	0.82012	0.029051
26	0.122248	1.08485	-0.031694
27	0.185915	1.31497	-0.073468
28	0.463805	0.96065	-0.005292
29	0.198164	1.18498	-0.050865
30	0.341385	0.44929	0.159725

```
MTB > stop
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```

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Lampiran II :

Analisa seluruh data tanpa penghapusan

```
MTB > retr'data01'
 WORKSHEET SAVED 12/ 6/1994
 Worksheet retrieved from file: data01.MTW

MTB > print c1-c5
```

ROW	C1	C2	C3	C4	C5
1	217	67	260	91	481
2	141	52	190	66	292
3	152	58	203	68	338
4	153	56	183	70	357
5	180	66	170	77	396
6	193	71	178	82	429
7	162	65	160	74	345
8	180	80	170	84	469
9	205	77	188	83	425
10	168	74	170	79	358
11	232	65	220	72	393
12	146	68	158	68	346
13	173	51	243	56	279
14	155	64	198	59	311
15	212	66	220	77	401
16	138	70	180	62	267
17	147	54	150	75	404
18	197	76	228	88	442
19	165	59	188	70	368
20	125	58	160	66	295
21	161	52	190	69	391
22	132	62	163	59	264
23	257	64	313	96	487
24	236	72	225	84	481
25	149	57	173	68	374
26	161	57	173	65	309
27	198	59	220	62	367
28	245	70	218	69	469
29	141	63	193	60	252
30	177	53	183	75	338

```
MTB > regres c5 on 4 pred c1-c4
```

The regression equation is

C5 = - 3.6 + 1.27 C1 - 0.525 C2 - 0.505 C3 + 3.90 C4

Predictor	Coef	Stdev	t-ratio	p
Constant	-3.62	56.10	-0.06	0.949
C1	1.2676	0.2869	4.42	0.000
C2	-0.5252	0.8628	-0.61	0.548
C3	-0.5050	0.2459	-2.05	0.051
C4	3.9030	0.7477	5.22	0.000

s = 28.67 R-sq = 85.3% R-sq(adj) = 83.0%

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Analysis of Variance

SOURCE	DF	SS	MS	F	p
Regression	4	119361	29840	36.30	0.000
Error	25	20551	822		
Total	29	139912			

SOURCE	DF	SEQ SS
C1	1	89117
C2	1	4680
C3	1	3165
C4	1	22399

Unusual Observations

Obs.	C1	C5	Fit	Stdev.Fit	Residual	St.Resid
23	257	487.00	505.17	20.54	-18.17	-0.91 X
30	177	338.00	393.22	12.60	-55.22	-2.14R

R denotes an obs. with a large st. resid.
X denotes an obs. whose X value gives it large influence.

```
MTB > stop
```

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Lampiran III :

Analisa pada penghapusan data ke-*19*

```
MTB > retr'data01'
 WORKSHEET SAVED 12/ 6/1994
 Worksheet retrieved from file: data01.MTW
MTB > delete 19 c1-c5
MTB > print c1-c5
```

ROW	C1	C2	C3	C4	C5
1	217	67	260	91	481
2	141	52	190	66	292
3	152	58	203	68	338
4	153	56	183	70	357
5	180	66	170	77	396
6	193	71	178	82	429
7	162	65	160	74	345
8	180	80	170	84	469
9	205	77	188	83	425
10	168	74	170	79	358
11	232	65	220	72	393
12	146	68	158	68	346
13	173	51	243	56	279
14	155	64	198	59	311
15	212	66	220	77	401
16	138	70	180	62	267
17	147	54	150	75	404
18	197	76	228	88	442
19	125	58	160	66	295
20	161	52	190	69	391
21	132	62	163	59	264
22	257	64	313	96	487
23	236	72	225	84	481
24	149	57	173	68	374
25	161	57	173	65	309
26	198	59	220	62	367
27	245	70	218	69	469
28	141	63	193	60	252
29	177	53	183	75	338

```
MTB > regres c5 on 4 pred c1-c4
The regression equation is
C5 = - 7.0 + 1.27 C1 - 0.479 C2 - 0.501 C3 + 3.89 C4
```

Predictor	Coef	Stdev	t-ratio	p
Constant	-7.05	57.28	-0.12	0.903
C1	1.2673	0.2911	4.35	0.000
C2	-0.4786	0.8797	-0.54	0.591
C3	-0.5006	0.2496	-2.01	0.056

s = 29.09 R-sq = 85.5% R-sq(adj) = 83.1%

Analysis of Variance

SOURCE	DF	SS	MS	F	p
Regression	4	119593	29898	35.33	0.000

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Error	24	20310	846
Total	28	139903	

SOURCE	DF	SEQ SS
C1	1	89348
C2	1	4912
C3	1	3089
C4	1	22244

Unusual Observations

Obs.	C1	C5	Fit	Stdev.Fit	Residual	St.Resid
29	177	338.00	392.12	12.95	-54.12	-2.08R

R denotes an obs. with a large st. resid.

```
MTB > stop
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Lampiran IV :

Analisa untuk penghapusan data ke-*23*

```
MTB > retr´data01´
 WORKSHEET SAVED 12/ 6/1994
 Worksheet retrieved from file: data01.MTW
MTB > delete 23 c1-c5
MTB > print c1-c5
```

ROW	C1	C2	C3	C4	C5
1	217	67	260	91	481
2	141	52	190	66	292
3	152	58	203	68	338
4	153	56	183	70	357
5	180	66	170	77	396
6	193	71	178	82	429
7	162	65	160	74	345
8	180	80	170	84	469
9	205	77	188	83	425
10	168	74	170	79	358
11	232	65	220	72	393
12	146	68	158	68	346
13	173	51	243	56	279
14	155	64	198	59	311
15	212	66	220	77	401
16	138	70	180	62	267
17	147	54	150	75	404
18	197	76	228	88	442
19	165	59	188	70	368
20	125	58	160	66	295
21	161	52	190	69	391
22	132	62	163	59	264
23	236	72	225	84	481
24	149	57	173	68	374
25	161	57	173	65	309
26	198	59	220	62	367
27	245	70	218	69	469
28	141	63	193	60	252
29	177	53	183	75	338

```
MTB > regre c5 on 4 pred c1-c4
The regression equation is
 C5 = - 32.1 + 1.21 C1 - 0.643 C2 - 0.371 C3 + 4.19 C4
```

Predictor	Coef	Stdev	t-ratio	p
Constant	-32.09	64.50	-0.50	0.623
C1	1.2104	0.2948	4.11	0.000
C2	-0.6428	0.8756	-0.73	0.470
C3	-0.3711	0.2878	-1.29	0.209
C4	4.1943	0.8165	5.14	0.000

s = 28.78 R-sq = 84.2% R-sq(adj) = 81.6%

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Analysis of Variance

SOURCE	DF	SS	MS	F	P
Regression	4	106103	26526	32.03	0.000
Error	24	19873	828		
Total	28	125976			

SOURCE	DF	SEQ SS
C1	1	75301
C2	1	4570
C3	1	4383
C4	1	21848

Unusual Observations

Obs.	C1	C5	Fit	Stdev.Fit	Residual	St.Resid
29	177	338.00	394.73	12.75	-56.73	-2.20R

R denotes an obs. with a large st. resid.

MTB > stop

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Lampiran V :

Analisa untuk penghapusan data ke-*30*

```
MTB > retr'data01'
 WORKSHEET SAVED 12/ 6/1994
 Worksheet retrieved from file: data01.MTW

MTB > delete 30 c1-c5
MTB > print c1-c5
```

ROW	C1	C2	C3	C4	C5
1	217	67	260	91	481
2	141	52	190	66	292
3	152	58	203	68	338
4	153	56	183	70	357
5	180	66	170	77	396
6	193	71	178	82	429
7	162	65	160	74	345
8	180	80	170	84	469
9	205	77	188	83	425
10	168	74	170	79	358
11	232	65	220	72	393
12	146	68	158	68	346
13	173	51	243	56	279
14	155	64	198	59	311
15	212	66	220	77	401
16	138	70	180	62	267
17	147	54	150	75	404
18	197	76	228	88	442
19	165	59	188	70	368
20	125	58	160	66	295
21	161	52	190	69	391
22	132	62	163	59	264
23	257	64	313	96	487
24	236	72	225	84	481
25	149	57	173	68	374
26	161	57	173	65	309
27	198	59	220	62	367
28	245	70	218	69	469
29	141	63	193	60	252

```
MTB > regre c5 on 4 pred c1-c4
The regression equation is
C5 = 31.7 + 1.38 C1 - 1.32 C2 - 0.642 C3 + 4.23 C4
```

Predictor	Coef	Stdev	t-ratio	p
Constant	31.72	53.91	0.59	0.562
C1	1.3838	0.2692	5.14	0.000
C2	-1.3158	0.8651	-1.52	0.141
C3	-0.6423	0.2343	-2.74	0.011
C4	4.2275	0.7034	6.01	0.000

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s = 26.44 R-sq = 87.9% R-sq(adj) = 85.9%

Analysis of Variance

SOURCE	DF	SS	MS	F	p
Regression	4	122017	30504	43.65	0.000
Error	24	16772	699		
Total	28	138790			

SOURCE	DF	SEQ SS
C1	1	89160
C2	1	3768
C3	1	3846
C4	1	25244

Unusual Observations

Obs.	C1	C5	Fit	Stdev.Fit	Residual	St.Resid
8	180	469.00	421.45	12.49	47.55	2.04R

R denotes an obs. with a large st. resid.

MTB > stop

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