Matlan Regresi

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1 Regresi

Kelompok :
Lintang Digdoyo(17523063)
Aswal Chusnan W(17523113)
Gilang Persada B(17523052)

```
In [16]: cost <- read.csv(file="C:/Users/digdo/Documents/R programming/Tugas R/costs.csv", header=TRUE, sep=",")
```

hlpi_name	year	hlpi	tot_hhs	own	own_wm	own_prop	own_wm_prop	prop_hhs	age	size	income	expenditure	eqv_income	eqv_exp
All households	2008	allhh	1560859	1087580	574406	69.7	36.8	100.0	35.9	2.7	46704	42394	26869	25132
Beneficiary	2008	benef	185965	71256	39405	38.3	21.2	11.9	29.9	2.6	23404	25270	14258	15824
Income quintile 1 (low)	2008	disq1	312376	191470	48424	61.3	15.5	20.0	40.0	2.3	16747	21145	13402	14408
Income quintile 2	2008	disq2	312333	196203	84171	62.8	26.9	20.0	34.7	2.8	31308	29855	18917	18266
Income quintile 3	2008	disq3	312240	217657	141318	69.7	45.3	20.0	31.5	3.0	49106	46561	26870	24672
Income quintile 4	2008	disq4	312336	229014	147658	73.3	47.3	20.0	35.3	2.6	61674	52776	36691	31958
Income quintile 5 (high)	2008	disq5	311574	253235	152835	81.3	49.1	20.0	39.3	2.5	96861	72822	55637	42932
Expenditure quintile 1 (low)	2008	expq1	312761	194358	49448	62.1	15.8	20.0	38.7	2.5	23680	16413	15190	11015
Expenditure quintile 2	2008	expq2	311973	206342	86390	66.1	27.7	20.0	36.1	2.7	34155	29085	20357	18121
Expenditure quintile 3	2008	expq3	311840	194361	108065	62.3	34.7	20.0	33.0	2.8	49771	42662	27203	25132
Expenditure quintile 4	2008	expq4	312257	231612	149007	74.2	47.7	20.0	35.1	2.7	60863	59015	34547	34167
Expenditure quintile 5 (high)	2008	expq5	312028	260907	181496	83.6	58.2	20.0	36.7	2.5	77434	89053	46269	51550
Maori	2008	maori	253018	119963	77076	47.4	30.5	16.2	28.9	3.2	42885	35312	23096	19797
Superannuitant	2008	super	300243	263054	15406	87.6	5.1	19.2	70.3	1.6	22367	21538	17203	17211
All households	2011	allhh	1607228	1048164	523698	65.2	32.6	100.0	36.3	2.6	53103	46098	30833	27335
Beneficiary	2011	benef	197237	56665	27129	28.7	13.8	12.3	28.0	2.7	25902	27605	16097	16685
Income quintile 1 (low)	2011	disq1	321848	166355	49952	51.7	15.5	20.0	36.3	2.4	19787	24224	15414	16221
Income quintile 2	2011	disq2	321751	187275	77561	58.2	24.1	20.0	35.0	2.9	37370	34200	21998	20586
Income quintile 3	2011	disq3	321372	204957	119746	63.8	37.3	20.0	33.4	2.9	54894	49431	30833	28130
Income quintile 4	2011	disq4	321507	226916	133454	70.6	41.5	20.0	36.8	2.6	69183	55569	42084	33019
Income quintile 5 (high)	2011	disq5	320751	262660	142986	81.9	44.6	20.0	40.9	2.4	106227	71815	63106	44712
Expenditure quintile 1 (low)	2011	expq1	321611	173327	35941	53.9	11.2	20.0	37.3	2.6	27501	18877	17612	13077
Expenditure quintile 2	2011	expq2	321894	179200	77025	55.7	23.9	20.0	35.1	2.7	38932	32790	22895	20168
Expenditure quintile 3	2011	expq3	321367	211728	108496	65.9	33.8	20.0	35.3	2.8	56117	46651	32053	27335
Expenditure quintile 4	2011	expq4	320918	224971	134525	70.1	41.9	20.0	35.3	2.7	64643	60862	38625	36203
Expenditure quintile 5 (high)	2011	expq5	321439	258938	167710	80.6	52.2	20.0	39.0	2.4	86431	90268	52895	52769
Maori	2011	maori	279128	115312	77879	41.3	27.9	17.4	28.3	3.2	51486	42801	27219	22651
Superannuitant	2011	super	321988	270179	23433	83.9	7.3	20.0	69.7	1.6	28064	25436	21335	20147
All households	2014	allhh	1639405	1090671	552580	66.5	33.7	100.0	37.0	2.6	57359	49330	33426	29683
Beneficiary	2014	benef	186134	45834	27032	24.6	14.5	11.4	27.3	2.5	26569	27348	17706	17893
Income quintile 1 (low)	2014	disq1	328349	171141	52691	52.1	16.0	20.0	37.4	2.4	22822	25809	17168	17555
Income quintile 2	2014	disq2	327432	190496	84148	58.2	25.7	20.0	34.2	2.9	41107	38498	24162	22743
Income quintile 3	2014	disq3	327566	219709	118724	67.1	36.2	20.0	34.8	2.8	58007	52941	33426	30133
Income quintile 4	2014	disq4	328158	237912	145756	72.5	44.4	20.0	38.2	2.6	78889	65874	47882	38147
Income quintile 5 (high)	2014	disq5	327900	271412	151260	82.8	46.1	20.0	41.0	2.4	122881	80806	72233	49571
Expenditure quintile 1 (low)	2014	expq1	327145	179585	41640	54.9	12.7	20.0	38.5	2.6	30138	19997	19171	13678
Expenditure quintile 2	2014	expq2	328033	191455	79697	58.4	24.3	20.0	35.7	2.7	42898	35822	25743	21961
Expenditure quintile 3	2014	expq3	328959	218610	113005	66.5	34.4	20.1	36.4	2.8	60890	49330	33139	29706
Expenditure quintile 4	2014	expq4	327692	229472	138029	70.0	42.1	20.0	36.5	2.6	80597	66519	45599	39787
Expenditure quintile 5 (high)	2014	expq5	327576	271549	180208	82.9	55.0	20.0	37.9	2.5	97676	97823	60056	56910
Maori	2014	maori	287053	127885	85034	44.6	29.6	17.5	30.2	3.1	56765	43582	28428	24850
Superannuitant	2014	super	357748	315121	41565	88.1	11.6	21.8	68.8	1.7	33168	29328	25404	23456
All households	2017	allhh	1690069	1125000	557880	66.6	33.0	100.0	37.4	2.7	64066	54293	36146	31409
Beneficiary	2017	benef	132215	30080	14220	22.8	10.8	7.8	29.1	2.8	29947	30054	16822	17655
Income quintile 1 (low)	2017	disq1	337948	182696	43443	54.1	12.9	20.0	40.3	2.3	22733	26775	18859	17850
Income quintile 2	2017	disq2	338573	189146	79743	55.9	23.6	20.0	35.2	3.0	45704	43676	25815	24077
Income quintile 3	2017	disq3	337875	216720	126551	64.1	37.5	20.0	34.7	3.1	66652	58065	36146	30908
Income quintile 4	2017	disq4	337646	249553	147278	73.9	43.6	20.0	37.1	2.7	85856	68119	50425	40219
Income quintile 5 (high)	2017	disq5	338027	286886	160865	84.9	47.6	20.0	41.1	2.5	133270	90983	79607	54244
Expenditure quintile 1 (low)	2017	expq1	338025	181960	32809	53.8	9.7	20.0	40.0	2.6	33596	20167	20674	14437
Expenditure quintile 2	2017	expq2	337869	194770	80172	57.6	23.7	20.0	36.1	2.8	50561	38052	27694	22792
Expenditure quintile 3	2017	expq3	338553	217590	117386	64.3	34.7	20.0	35.7	2.9	65099	54936	35959	31409
Expenditure quintile 4	2017	expq4	338127	249664	154618	73.8	45.7	20.0	37.1	2.6	81699	72718	47432	42940
Expenditure quintile 5 (high)	2017	expq5	337496	281016	172895	83.3	51.2	20.0	38.3	2.6	109930	115746	67081	67680
Maori	2017	maori	295322	146979	89146	49.8	30.2	17.5	32.0	3.1	62193	50982	31571	26395
Superannuitant	2017	super	390232	329269	33310	84.4	8.5	23.1	69.9	1.6	33911	30486	24803	23968

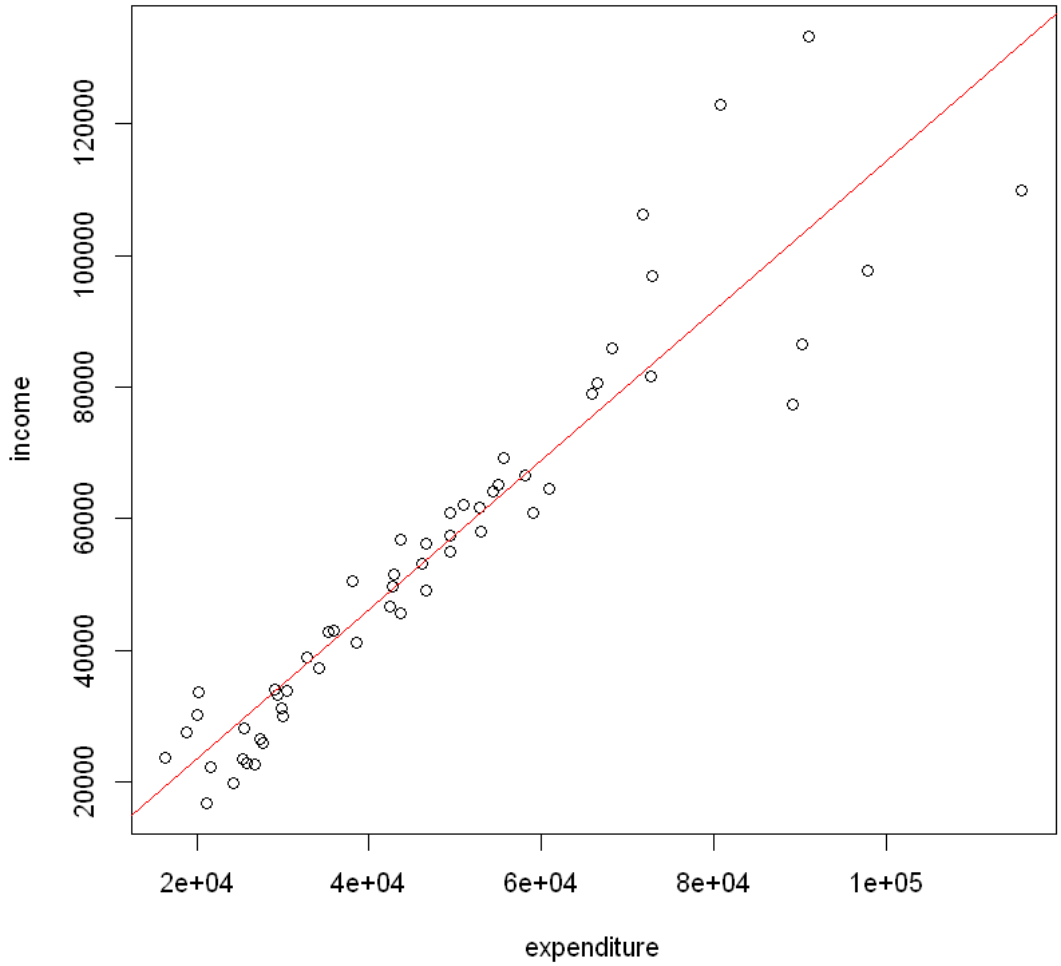
```
In [34]: model <- lm(income ~ expenditure, data = cost)
         summary(model)
         coefficients(model)
         predict(model, data.frame(expenditure = 30000))
```

```
Call:
lm(formula = income ~ expenditure, data = cost)

Residuals:
     Min       1Q   Median       3Q      Max
-24488.6  -4747.5    -50.5   3657.3  30325.8

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept) 7.704e+02  3.052e+03   0.252    0.802
expenditure 1.136e+00  5.837e-02  19.461   <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 9735 on 54 degrees of freedom
Multiple R-squared:  0.8752,Adjusted R-squared:  0.8729
F-statistic: 378.7 on 1 and 54 DF,  p-value: < 2.2e-16
```

(Intercept) 770.425496488842 **expenditure** 1.13586533959301
1: 34846.3856842791

Berdasarkan output, dapat diperoleh rumus income = 770.425496488842 + 1.13586533959301 * expenditure dengan kesalahan 9735 pada 54 derajat kebebasan

```
In [18]: plot(income ~ expenditure, data = cost)
         abline(model, col="red",lwd=1)
```



In [32]:
```
poly_model <- lm(income ~ poly(expenditure,degree=1), data = cost)
poly_model

coefficients(poly_model)
```

```
Call:
lm(formula = income ~ poly(expenditure, degree = 1), data = cost)

Coefficients:
                  (Intercept)  poly(expenditure, degree = 1)
                        54493                         189442
```

(Intercept) 54492.5357142857 **poly(expenditure, degree = 1)** 189441.649943406

Berdasarkan output, dapat diperoleh rumus income = 54492.5357142857 + 189441.649943406 * expenditure, dengan derajat 1

```
In [31]: x <- with(cost, seq(min(expenditure), max(expenditure), length.out=2000))
         y <- predict(poly_model, newdata = data.frame(expenditure = x))
         plot(income ~ expenditure, data = cost)
         lines(x, y, col = "blue")
```