

REGRESI

Raditia Fadillah Akbar(17523056)

Izzan Yattaqi(17523060)

Adhin Alifarchan(17523062)

December 3, 2018

```
In [57]: cross = read.csv("C:/Users/Lenovo/Downloads/Sac.csv", header = TRUE)
```

street	city	zip	state	beds	baths	sq_ft	type	sale_date	price	latitude	longitude
3526 HIGH ST	SACRAMENTO	95838	CA	2	1	836	Residential	Wed May 21 00:00:00 EDT 2008	59222	38.63191	-121.4349
51 OMAHA CT	SACRAMENTO	95823	CA	3	1	1167	Residential	Wed May 21 00:00:00 EDT 2008	68212	38.47890	-121.4310
2796 BRANCH ST	SACRAMENTO	95815	CA	2	1	796	Residential	Wed May 21 00:00:00 EDT 2008	68880	38.61830	-121.4438
2805 JANETTE WAY	SACRAMENTO	95815	CA	2	1	852	Residential	Wed May 21 00:00:00 EDT 2008	69307	38.61684	-121.4391
6001 MCMAHON DR	SACRAMENTO	95824	CA	2	1	797	Residential	Wed May 21 00:00:00 EDT 2008	81900	38.51947	-121.4358
5828 PEPPERMILL CT	SACRAMENTO	95841	CA	3	1	1122	Condo	Wed May 21 00:00:00 EDT 2008	89921	38.66260	-121.3278
6048 OGDEN NASH WAY	SACRAMENTO	95842	CA	3	2	1104	Residential	Wed May 21 00:00:00 EDT 2008	90895	38.68166	-121.3517
2561 19TH AVE	SACRAMENTO	95820	CA	3	1	1177	Residential	Wed May 21 00:00:00 EDT 2008	91002	38.53509	-121.4814
11150 TRINITY RIVER DR Unit 114	RANCHO CORDOVA	95670	CA	2	2	941	Condo	Wed May 21 00:00:00 EDT 2008	94905	38.62119	-121.2706
7325 10TH ST	RIO LINDA	95673	CA	3	2	1146	Residential	Wed May 21 00:00:00 EDT 2008	98937	38.70091	-121.4430
645 MORRISON AVE	SACRAMENTO	95838	CA	3	2	909	Residential	Wed May 21 00:00:00 EDT 2008	100309	38.63766	-121.4515
4085 FAWN CIR	SACRAMENTO	95823	CA	3	2	1289	Residential	Wed May 21 00:00:00 EDT 2008	106250	38.47075	-121.4589
2930 LA ROSA RD	SACRAMENTO	95815	CA	1	1	871	Residential	Wed May 21 00:00:00 EDT 2008	106852	38.61870	-121.4358
2113 KIRK WAY	SACRAMENTO	95822	CA	3	1	1020	Residential	Wed May 21 00:00:00 EDT 2008	107502	38.48221	-121.4926
4533 LOCH HAVEN WAY	SACRAMENTO	95842	CA	2	2	1022	Residential	Wed May 21 00:00:00 EDT 2008	108750	38.67291	-121.3593
7340 HAMDEN PL	SACRAMENTO	95842	CA	2	2	1134	Condo	Wed May 21 00:00:00 EDT 2008	110700	38.70005	-121.3513
6715 6TH ST	RIO LINDA	95673	CA	2	1	844	Residential	Wed May 21 00:00:00 EDT 2008	113263	38.68959	-121.4522
6236 LONGFORD DR Unit 1	CITRUS HEIGHTS	95621	CA	2	1	795	Condo	Wed May 21 00:00:00 EDT 2008	116250	38.67978	-121.3141
250 PERALTA AVE	SACRAMENTO	95833	CA	2	1	588	Residential	Wed May 21 00:00:00 EDT 2008	120000	38.61210	-121.4691
113 LEEWILL AVE	RIO LINDA	95673	CA	3	2	1356	Residential	Wed May 21 00:00:00 EDT 2008	121630	38.69000	-121.4632
6118 STONEHAND AVE	CITRUS HEIGHTS	95621	CA	3	2	1118	Residential	Wed May 21 00:00:00 EDT 2008	122000	38.70785	-121.3207
4882 BANDALIN WAY	SACRAMENTO	95823	CA	4	2	1329	Residential	Wed May 21 00:00:00 EDT 2008	122682	38.46817	-121.4441
7511 OAKVALE CT	NORTH HIGHLANDS	95660	CA	4	2	1240	Residential	Wed May 21 00:00:00 EDT 2008	123000	38.70279	-121.3822
9 PASTURE CT	SACRAMENTO	95834	CA	3	2	1601	Residential	Wed May 21 00:00:00 EDT 2008	124100	38.62863	-121.4881
3729 BAINBRIDGE DR	NORTH HIGHLANDS	95660	CA	3	2	901	Residential	Wed May 21 00:00:00 EDT 2008	125000	38.70150	-121.3762
3828 BLACKFOOT WAY	ANTELOPE	95843	CA	3	2	1088	Residential	Wed May 21 00:00:00 EDT 2008	126640	38.70974	-121.3738
4108 NORTON WAY	SACRAMENTO	95820	CA	3	1	963	Residential	Wed May 21 00:00:00 EDT 2008	127281	38.53753	-121.4783
1469 JANRICK AVE	SACRAMENTO	95832	CA	3	2	1119	Residential	Wed May 21 00:00:00 EDT 2008	129000	38.47647	-121.5017
9861 CULP WAY	SACRAMENTO	95827	CA	4	2	1380	Residential	Wed May 21 00:00:00 EDT 2008	131200	38.55842	-121.3279
7825 CREEK VALLEY CIR	SACRAMENTO	95828	CA	3	2	1248	Residential	Wed May 21 00:00:00 EDT 2008	132000	38.47212	-121.4042
...
2100 BEATTY WAY	ROSEVILLE	95747	CA	3	2	1371	Residential	Thu May 15 00:00:00 EDT 2008	208250	38.73788	-121.3081
6920 GILLINGHAM WAY	NORTH HIGHLANDS	95660	CA	3	1	1310	Residential	Thu May 15 00:00:00 EDT 2008	208318	38.69428	-121.3734
82 WILDFLOWER DR	GALT	95632	CA	3	2	1262	Residential	Thu May 15 00:00:00 EDT 2008	209347	38.25971	-121.3116
8652 BANTON CIR	ELK GROVE	95624	CA	4	2	1740	Residential	Thu May 15 00:00:00 EDT 2008	211500	38.44400	-121.3710
8428 MISTY PASS WAY	ANTELOPE	95843	CA	3	2	1517	Residential	Thu May 15 00:00:00 EDT 2008	212000	38.72296	-121.3471
7958 ROSEVIEW WAY	SACRAMENTO	95828	CA	3	2	1450	Residential	Thu May 15 00:00:00 EDT 2008	213000	38.46784	-121.4104
9020 LUKEN CT	ELK GROVE	95624	CA	3	2	1416	Residential	Thu May 15 00:00:00 EDT 2008	216000	38.45140	-121.3666
7809 VALLECITOS WAY	SACRAMENTO	95828	CA	3	1	888	Residential	Thu May 15 00:00:00 EDT 2008	216021	38.50822	-121.4112
8445 OLD AUBURN RD	CITRUS HEIGHTS	95610	CA	3	2	1882	Residential	Thu May 15 00:00:00 EDT 2008	219000	38.71542	-121.2467
10085 ATKINS DR	ELK GROVE	95757	CA	3	2	1302	Residential	Thu May 15 00:00:00 EDT 2008	219794	38.39089	-121.4378
9185 CERROLINDA CIR	ELK GROVE	95758	CA	3	2	1418	Residential	Thu May 15 00:00:00 EDT 2008	220000	38.42450	-121.4266
9197 CORTINA CIR	ROSEVILLE	95678	CA	3	2	0	Condo	Thu May 15 00:00:00 EDT 2008	220000	38.79315	-121.2900
5429 HESPER WAY	CARMICHAEL	95608	CA	4	2	1319	Residential	Thu May 15 00:00:00 EDT 2008	220000	38.66510	-121.3159
1178 WARMWOOD CT	GALT	95632	CA	4	2	1770	Residential	Thu May 15 00:00:00 EDT 2008	220000	38.28954	-121.2846
4900 ELUDE CT	SACRAMENTO	95842	CA	4	2	1627	Residential	Thu May 15 00:00:00 EDT 2008	223000	38.69674	-121.3505
3557 SODA WAY	SACRAMENTO	95834	CA	0	0	0	Residential	Thu May 15 00:00:00 EDT 2008	224000	38.63103	-121.5019
3528 SAINT GEORGE DR	SACRAMENTO	95821	CA	3	1	1040	Residential	Thu May 15 00:00:00 EDT 2008	224000	38.62947	-121.3764
7381 WASHBURN WAY	NORTH HIGHLANDS	95660	CA	3	1	960	Residential	Thu May 15 00:00:00 EDT 2008	224252	38.70355	-121.3751
2181 WINTERHAVEN CIR	CAMERON PARK	95682	CA	3	2	0	Residential	Thu May 15 00:00:00 EDT 2008	224500	38.69757	-120.9957
7540 HICKORY AVE	ORANGEVALE	95662	CA	3	1	1456	Residential	Thu May 15 00:00:00 EDT 2008	225000	38.70306	-121.2352
5024 CHAMBERLIN CIR	ELK GROVE	95757	CA	3	2	1450	Residential	Thu May 15 00:00:00 EDT 2008	228000	38.38976	-121.4462
2400 INVERNESS DR	LINCOLN	95648	CA	3	2	1358	Residential	Thu May 15 00:00:00 EDT 2008	229027	38.89781	-121.3247
5 BISHOPGATE CT	SACRAMENTO	95823	CA	4	2	1329	Residential	Thu May 15 00:00:00 EDT 2008	229500	38.46794	-121.4455
5601 REXLEIGH DR	SACRAMENTO	95823	CA	4	2	1715	Residential	Thu May 15 00:00:00 EDT 2008	230000	38.44534	-121.4415
1909 YARNELL WAY	ELK GROVE	95758	CA	3	2	1262	Residential	Thu May 15 00:00:00 EDT 2008	230000	38.41738	-121.4843
9169 GARLINGTON CT	SACRAMENTO	95829	CA	4	3	2280	Residential	Thu May 15 00:00:00 EDT 2008	232425	38.45768	-121.3596
6932 RUSKUT WAY	SACRAMENTO	95823	CA	3	2	1477	Residential	Thu May 15 00:00:00 EDT 2008	234000	38.49889	-121.4589
7933 DAFFODIL WAY	CITRUS HEIGHTS	95610	CA	3	2	1216	Residential	Thu May 15 00:00:00 EDT 2008	235000	38.70882	-121.2568
8304 RED FOX WAY	ELK GROVE	95758	CA	4	2	1685	Residential	Thu May 15 00:00:00 EDT 2008	235301	38.41700	-121.3974
3882 YELLOWSTONE LN	EL DORADO HILLS	95762	CA	3	2	1362	Residential	Thu May 15 00:00:00 EDT 2008	235738	38.65525	-121.0759

```
In [74]: model <-lm( latitude ~ longitude, data= cross)
summary(model)
coefficients(model)
```

```

Call:
lm(formula = latitude ~ longitude, data = cross)

Residuals:
    Min       1Q   Median       3Q      Max
-0.38409 -0.10328 -0.00152  0.09414  0.28276

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 88.12067    3.75215   23.48  <2e-16 ***
longitude    0.40800    0.03092   13.20  <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1341 on 983 degrees of freedom
Multiple R-squared:  0.1505, Adjusted R-squared:  0.1496
F-statistic: 174.1 on 1 and 983 DF,  p-value: < 2.2e-16

```

(Intercept) 88.1206701237773 **longitude** 0.407997505564959

Berdasarkan hasil keluarannya, nilai incomenya adalah 88.12067 sebagai intersip dan 0.40800 sebagai slope(lereng), dengan kesalahan 0.1341 pada 983 derajat kebebasan, oleh karena itu prediksi persamaan untuk modelnya sebagai berikut:

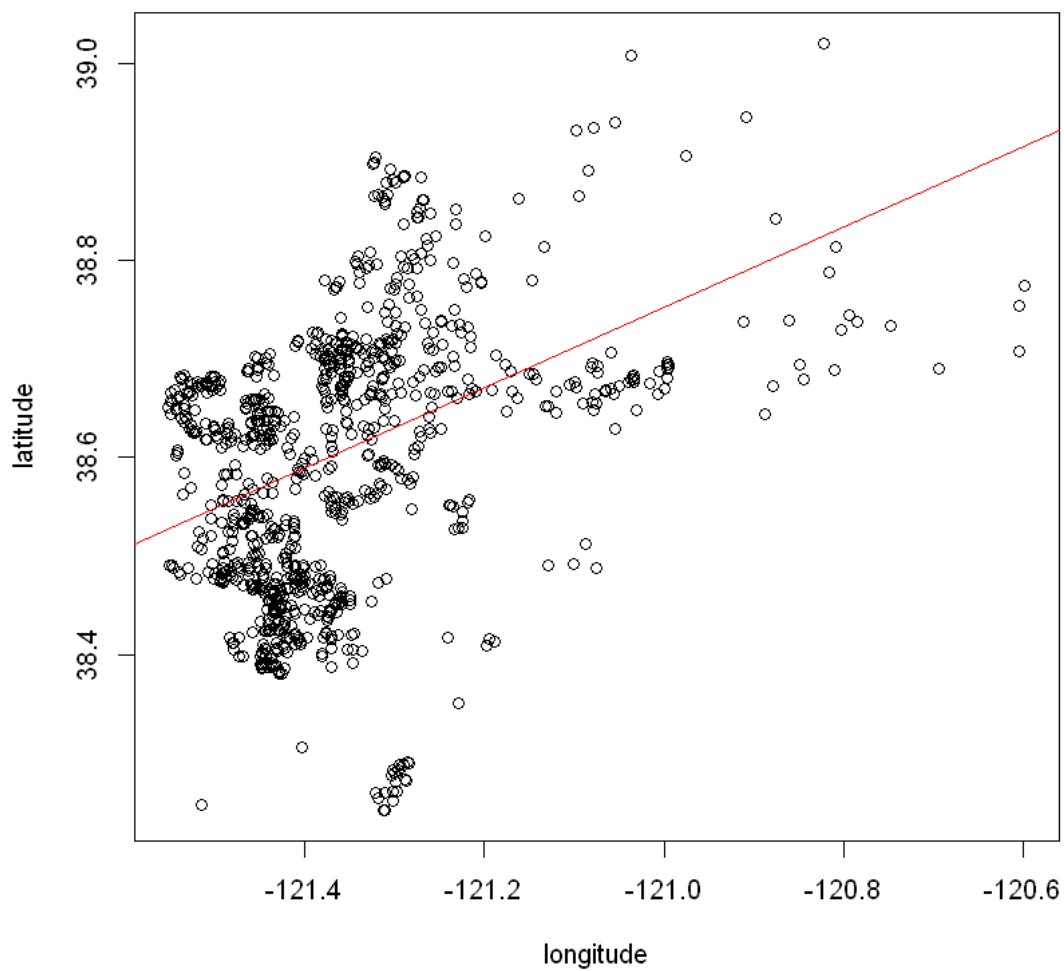
$\text{longitude} = 88.12067 + 0.40800 \cdot \text{latitude}$

Selanjutnya kita bisa menambahkan garis regresi ke dalam plot dengan rumus sbg berikut :

```

In [71]: plot( latitude ~ longitude , data= cross)
         abline(model, col = "red", lwd = 1)

```



selanjutnya kita bisa memprediksi nilai berdasarkan model yang sudah kita buat

```
In [77]: predict(model, data.frame(longitude = 3000 ))
```

```
1: 1312.11318681865
```

```
In [91]: poly_model <- lm(latitude ~ poly(longitude,degree=1), data = cross)
poly_model
```

```
coefficients(poly_model)
```

Call:

```
lm(formula = latitude ~ poly(longitude, degree = 1), data = cross)
```

Coefficients:

```
(Intercept)  poly(longitude, degree = 1)
38.61        1.77
```

(Intercept) 38.6077320862944 **poly(longitude, degree = 1)** 1.76973333661926
berdasarkan hasil keluaran, didapatkan income $38.61 + 1.77 * \text{longitude}$ dengan derajat 1

```
In [95]: x <- with(cross, seq(min(longitude), max(longitude), length.out=3000))
y <- predict(poly_model, newdata = data.frame(longitude = x))
plot(latitude ~ longitude, data = cross)
lines(x, y, col = "green")
```

