

# Hypothesis testing, Regression and Classification

## Basic Statistics using RStudio

1/15/2021

```
# uploading data into the software with strings as factors
Project<-read.csv("C:/Users/asus/Desktop/TASKS/RSTUDIO TASKS/Classification task in RStudio/melbourne_housing_data.csv",stringsAsFactors=TRUE)
Project$Type<-factor(Project$Type,levels=c(1,2,3),labels=c("h","t","u"))
```

### Part A

This project focuses on hypothesis formulation as well as hypothesis testing. Exploratory data analysis was carried out through use of basic descriptive statistics of housing prices as well as their distances and how distances affect the prices of these houses. Below are some of the exploratory data analysis used to explore Melbourne housing dataset:

```
# displaying the data in the table
library(knitr)
knitr::kable(head(Project[,c(2,3,6,8,11,13)]),caption="Table 1: A table of the first six rows and six selected columns")
```

Table 1: A table of the first six rows and six selected columns

Suburb	Address	Price	SellerG	Regionname	Distance
Abbotsford	49 Lithgow St	1490000	Jellis	Northern Metropolitan	3.0
Abbotsford	59A Turner St	1220000	Marshall	Northern Metropolitan	3.0
Abbotsford	119B Yarra St	1420000	Nelson	Northern Metropolitan	3.0
Aberfeldie	68 Vida St	1515000	Barry	Western Metropolitan	7.5
Airport West	92 Clydesdale Rd	670000	Nelson	Western Metropolitan	10.4
Airport West	4/32 Earl St	530000	Jellis	Western Metropolitan	10.4

```
#summaries of price and distance variables
library(pastecs)
Desc.stat<-stat.desc(Project[,c(6,13)],basic=FALSE,desc =TRUE)
knitr::kable(Desc.stat,caption="Table 2: Summary statistics of Price and Distance")
```

Table 2: Summary statistics of Price and Distance

	Price	Distance
median	8.300000e+05	11.7000000
mean	9.978982e+05	12.7027605
SE.mean	2.696803e+03	0.0343066
CI.mean.0.95	5.285769e+03	0.0672414
var	3.522410e+11	57.0029539
std.dev	5.934989e+05	7.5500301
coef.var	5.947489e-01	0.5943614

## Hypotheses

Three hypotheses were used to explore the dataset. The null hypotheses stated as below: i) There was no significant difference in prices of houses across the regions.

ii) There was no association between house type and regions.

iii) Distance does not predict the price of a house

## Hypothesis 1

To explore the first hypothesis, a One-way ANOVA was used. The null hypothesis stated that there was no significant difference in prices of the houses across the regions. In contrast, an alternative hypothesis stated that there was a statistically significant difference in housing prices across different regions.

```
# summary table of prices by regions
library(dplyr)

##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:base':
##
##   first, last

## The following objects are masked from 'package:stats':
##
##   filter, lag

## The following objects are masked from 'package:base':
##
##   intersect, setdiff, setequal, union

Summ=Project%>%
group_by(Regionname)%>%
  summarise(Obs=n(), Mean=mean(Price,na.rm=TRUE),SD=sd(Price,na.rm=TRUE))
```

```
## `summarise()` ungrouping output (override with `.groups` argument)

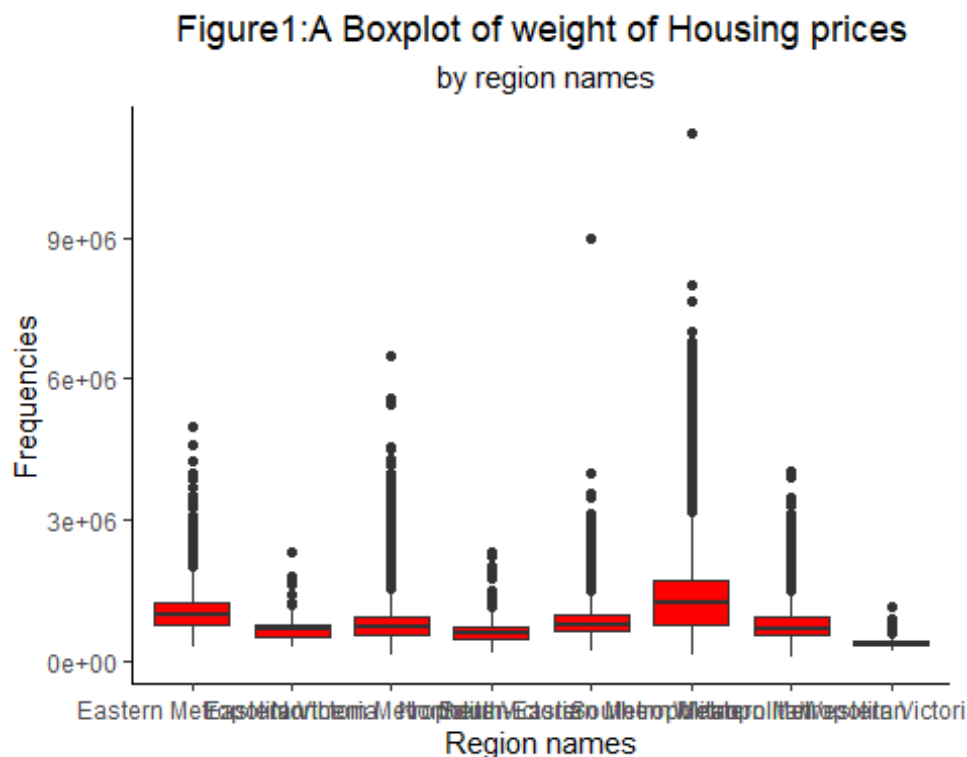
kable(Summ,caption="Table 3: summary statistics of housing prices by regions"
)
```

Table 3: summary statistics of housing prices by regions

Regionname	Obs	Mean	SD
Eastern Metropolitan	7585	1071837.5	415250.2
Eastern Victoria	374	689368.8	220134.6
Northern Metropolitan	13598	823719.8	416156.1
Northern Victoria	455	643082.2	269380.6
South-Eastern Metropolitan	4010	846235.2	359620.6
Southern Metropolitan	12549	1373221.8	829559.4
Western Metropolitan	9680	800516.3	372547.5
Western Victoria	182	412026.1	122663.2

## Boxplot of the Pricing of different regions

```
library(ggplot2)
ggplot(Project,aes(y=Price,x=Regionname))+geom_boxplot(fill="red")+theme_classic()+labs(title="Figure1:A Boxplot of weight of Housing prices",subtitle=" by region names")+theme(plot.title=element_text(hjust=0.5),plot.subtitle=element_text(hjust=0.5))+ylab("Frequencies")+xlab("Region names")
```



*# One-way ANOVA to assess significant difference in average housing prices across different*

```
library(car)
```

```
## Loading required package: carData
```

```
##
```

```
## Attaching package: 'car'
```

```
## The following object is masked from 'package:dplyr':
```

```
##
```

```
##      recode
```

```
linmodel<-lm(Price~Regionname,data=Project)
```

```
sstable<-Anova(linmodel,type=3)
```

```
kable(sstable,digits=3,caption="Table 4:One-way ANOVA of housing prices by regions")
```

*Table 4:One-way ANOVA of housing prices by regions*

	Sum Sq	Df	F value	Pr(>F)
(Intercept)	8.713918e+15	1	29688.577	0
Regionname	2.846474e+15	7	1385.432	0
Residuals	1.421326e+16	48425	NA	NA

Table 4 results illustrated that there was significant difference in the average housing prices across the regions,  $F(7, 48425)=1385.432$ ,  $p<0.001$ . A further analysis was conducted to explore significant mean differences of housing prices across regions. The main aim was to explore all the significant average differences of the housing prices in different regions. A tukeyHSD was used to explore the significant differences.

```
library(multcomp)
```

```
## Loading required package: mvtnorm
```

```
## Loading required package: survival
```

```
## Loading required package: TH.data
```

```
## Loading required package: MASS
```

```
##
```

```
## Attaching package: 'MASS'
```

```
## The following object is masked from 'package:dplyr':
```

```
##
```

```
##      select
```

```
##
```

```
## Attaching package: 'TH.data'
```

```
## The following object is masked from 'package:MASS':
##
##      geyser

f1<-aov(Price~Regionname,data=Project)
sstable1<-TukeyHSD(f1,"Regionname",ordered=TRUE)
Ran<-(sstable1)
Ran_data<-as.data.frame(Ran[1:1])
kable(Ran_data,caption="Table 5: Multiple comparisons for average housing pr
ices across regions")
```

*Table 5: Multiple comparisons for average housing prices across regions*

	Regionname.dif f	Regionname.lw r	Regionname.up r	Regionname.p.ad j
Northern Victoria- Western Victoria	231056.07	87040.687	375071.46	0.0000317
Eastern Victoria- Western Victoria	277342.71	128938.417	425747.01	0.0000004
Western Metropolitan -Western Victoria	388490.19	265636.082	511344.30	0.0000000
Northern Metropolitan -Western Victoria	411693.75	289166.699	534220.79	0.0000000
South- Eastern Metropolitan -Western Victoria	434209.07	309762.384	558655.75	0.0000000
Eastern Metropolitan -Western Victoria	659811.38	536644.559	782978.20	0.0000000
Southern Metropolitan -Western Victoria	961195.67	838601.007	1083790.34	0.0000000

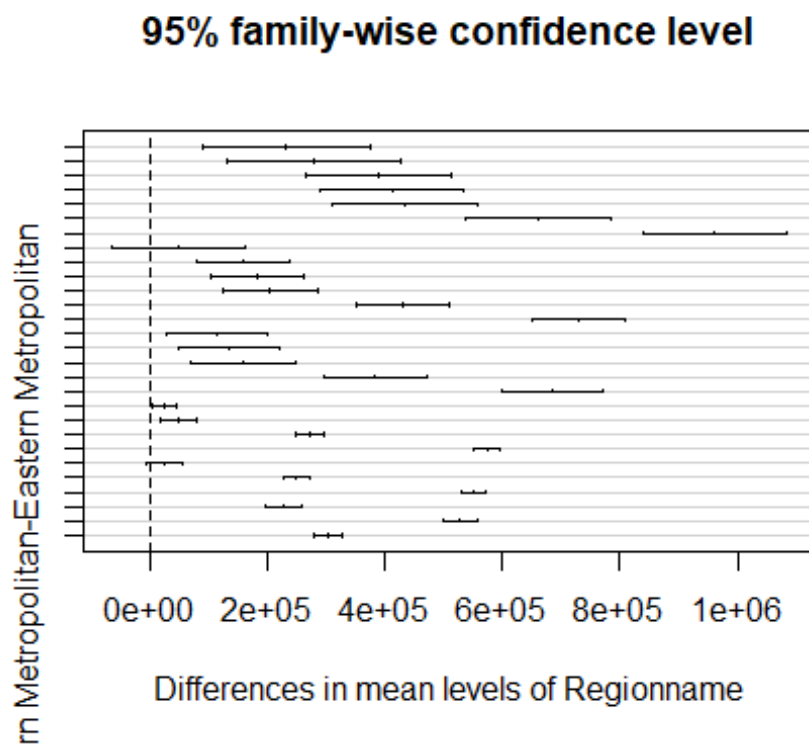
Eastern Victoria- Northern Victoria	46286.64	-68321.731	160895.01	0.9250281
Western Metropolitan -Northern Victoria	157434.12	78666.257	236201.98	0.0000000
Northern Metropolitan -Northern Victoria	180637.67	102380.911	258894.43	0.0000000
South- Eastern Metropolitan -Northern Victoria	203152.99	121923.563	284382.43	0.0000000
Eastern Metropolitan -Northern Victoria	428755.31	349500.594	508010.02	0.0000000
Southern Metropolitan -Northern Victoria	730139.60	651777.008	808502.19	0.0000000
Western Metropolitan -Eastern Victoria	111147.48	24615.524	197679.44	0.0025110
Northern Metropolitan -Eastern Victoria	134351.03	48284.060	220418.01	0.0000609
South- Eastern Metropolitan -Eastern Victoria	156866.36	68087.845	245644.87	0.0000024
Eastern Metropolitan -Eastern Victoria	382468.67	295493.311	469444.03	0.0000000

Southern Metropolitan -Eastern Victoria	683852.96	597689.749	770016.17	0.0000000
Northern Metropolitan -Western Metropolitan	23203.55	1367.295	45039.81	0.0280038
South- Eastern Metropolitan -Western Metropolitan	45718.87	14881.852	76555.90	0.0001886
Eastern Metropolitan -Western Metropolitan	271321.19	246141.613	296500.76	0.0000000
Southern Metropolitan -Western Metropolitan	572705.48	550492.936	594918.02	0.0000000
South- Eastern Metropolitan -Northern Metropolitan	22515.32	-6991.734	52022.38	0.2864201
Eastern Metropolitan -Northern Metropolitan	248117.63	224585.627	271649.64	0.0000000
Southern Metropolitan -Northern Metropolitan	549501.93	529176.044	569827.81	0.0000000
Eastern Metropolitan -South- Eastern Metropolitan	225602.31	193542.133	257662.49	0.0000000
Southern Metropolitan -South-	526986.61	497200.009	556773.20	0.0000000

Eastern Metropolitan				
Southern Metropolitan	301384.29	277502.701	325265.88	0.0000000
-Eastern Metropolitan				

## Plots of TukeyHSD

```
plot(sstable1)
```



## Hypothesis 2

This hypothesis aims at exploring statistically significant association between the type of a house and the associated region. A null hypothesis stated that there was no association between the type of the house and the region it's situated while the alternative hypothesis stated that there was a statistically significant association between the type of houses and where they are situated. A chi-square test was used to explore this hypothesis.

```
attach(Project)
freq<-table(Regionname,Type)
kable(freq,caption="Table 6: Cross-tabulation of Region names and Housing type")
```



Table 6: Cross-tabulation of Region names and Housing type

	h	t	u
Eastern Metropolitan	5971	651	963
Eastern Victoria	363	4	7
Northern Metropolitan	9639	1438	2521
Northern Victoria	444	2	9
South-Eastern Metropolitan	3023	416	571
Southern Metropolitan	6937	1607	4005
Western Metropolitan	7610	862	1208
Western Victoria	174	0	8

```
chisq.test(freq)
```

```
##
##  Pearson's Chi-squared test
##
## data:  freq
## X-squared = 2557.4, df = 14, p-value < 2.2e-16
```

From the results, it was concluded that there was an association between house types and the regions they are located,  $X^2(14) = 2557.4$ ,  $p < 0.001$ . It was noted that the type of houses built were strongly associated to the regions they were built.

### Hypothesis 3

To explore this hypothesis, a simple linear regression model was used. The null hypothesis stated that distance from where a house was located did not predict the price of the house. In contrast, an alternative hypothesis stated that the price of a house was determined by the distance from which the house was situated.

```
Linmodel<-lm(Price~Distance,data=Project)
Mod<-summary(Linmodel)
kable(Mod$coefficients,caption="Table8:Regression Coefficients")
```

Table8:Regression Coefficients

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	1251197.7	5105.700	245.05898	0
Distance	-19940.5	345.515	-57.71242	0

From the results, it was concluded that the distance from which a house was built predicted the price of the houses,  $F(1,48431) = 3330.72$ ,  $p = 0.00$ ,  $R^2 = 0.06$ ,  $\text{Adj. } R^2 = 0.06$ . It was also revealed that distance from where the house is erected explained 6% of the total variation of prices of the houses. ## Model Diagnostics

```
#Diagnostic plots
```

```
library(ggfortify)
```

```
autoplot(Linmodel)
```

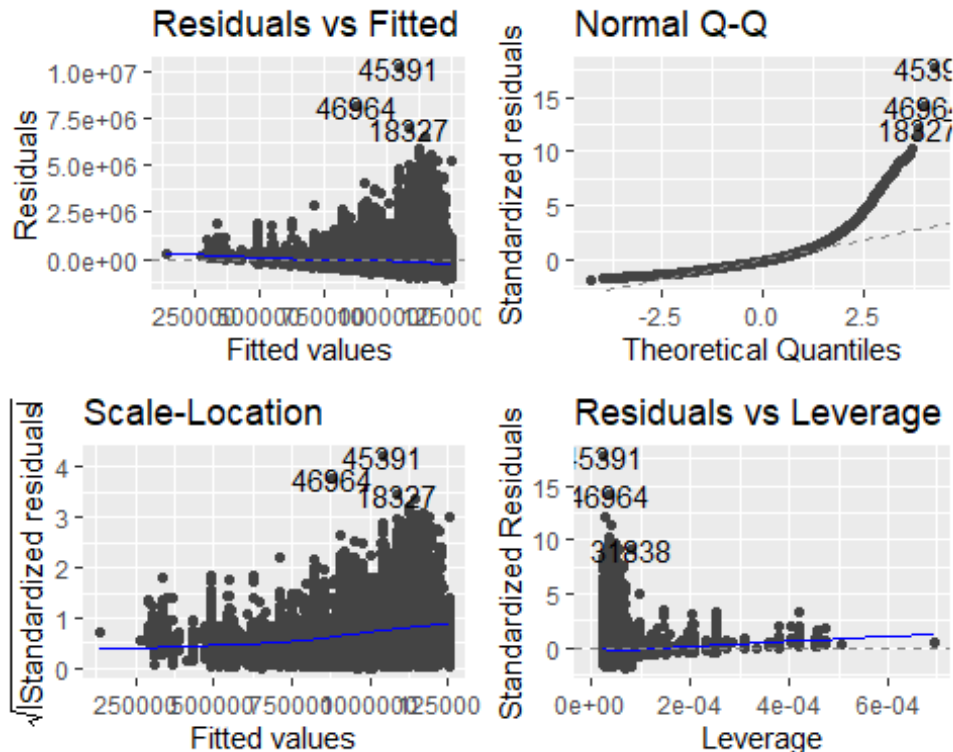
```
## Warning: `arrange()` is deprecated as of dplyr 0.7.0.
```

```
## Please use `arrange()` instead.
```

```
## See vignette('programming') for more help
```

```
## This warning is displayed once every 8 hours.
```

```
## Call `lifecycle::last_warnings()` to see where this warning was generated.
```



From the model

diagnostics, there were several outliers in the prices of the models. The assumption of linearity of the residuals was violated. Also, it was revealed that the assumption of constant variance was also violated.

## Part B

```
#splitting dataset for both training and test dataset
```

```
require(caTools)
```

```
## Loading required package: caTools
```

```
sample = sample.split(Project$Price, SplitRatio = .75)
```

```
training = subset(Project, sample == TRUE)
```

```
test = subset(Project, sample == FALSE)
```

## 1.Untransformed Multiple Regression Model

```
training<-na.omit(training)
```

```
Ful.Model<-lm(Price~Distance+Type+Rooms+Regionname+SellerG+CouncilArea,data=t
```

```
raining)
Model<-summary(Ful.Model)
kable(Model$coefficients,caption="Table9: Multiple Regression Coefficients")
```

Table9: Multiple Regression Coefficients

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	523416.625	90067.6048	5.8113750	0.0000000
Distance	-27884.436	809.1096	-34.4631150	0.0000000
Typet	-235481.502	6966.9155	-33.7999652	0.0000000
Typeu	-434735.121	6421.9272	-67.6954301	0.0000000
Rooms	236025.863	2649.8474	89.0714921	0.0000000
RegionnameEastern Victoria	-93517.819	42956.0359	-2.1770589	0.0294826
RegionnameNorthern Metropolitan	-183577.953	15059.4423	-12.1902226	0.0000000
RegionnameNorthern Victoria	8549.828	49595.6850	0.1723906	0.8631315
RegionnameSouth-Eastern Metropolitan	-121864.638	19331.4200	-6.3039672	0.0000000
RegionnameSouthern Metropolitan	-148567.263	15344.5484	-9.6820877	0.0000000
RegionnameWestern Metropolitan	-150441.698	26750.4078	-5.6239030	0.0000000
RegionnameWestern Victoria	49598.415	51812.3551	0.9572700	0.3384374
SellerGA	-104676.623	210601.369	-0.4970368	0.6191661
SellerGAbercromby's	831984.655	110647.972	7.5192038	0.0000000
SellerGAbley	-77078.042	392941.500	-0.1961565	0.8444887

SellerGAce	234755.612	210688.350	1.1142316	0.265187
		0		2
SellerGAlex	213907.698	239139.563	0.8944890	0.371066
		9		3
SellerGAlexkarbon	79548.036	97933.8986	0.8122625	0.416646
				3
SellerGAllens	17508.982	121767.633	0.1437901	0.885667
		9		0
SellerGAnderson	-47680.848	210807.859	-	0.821061
		6	0.2261815	5
SellerGAppleby	-	179674.947	-	0.383585
	156554.247	5	0.8713193	6
SellerGAquire	66052.013	120087.944	0.5500303	0.582301
		8		9
SellerGARbee	52213.301	249557.881	0.2092232	0.834275
		6		2
SellerGArea	93637.357	105890.858	0.8842818	0.376550
		6		0
SellerGAscend	431965.755	149806.701	2.8834875	0.003935
		1		3
SellerGAsh	-84298.917	170412.676	-	0.620832
		5	0.4946752	4
SellerGASL	105286.623	161517.355	0.6518595	0.514495
		6		9
SellerGAsset	92648.348	123434.216	0.7505889	0.452905
		8		0
SellerGAssisi	325157.829	237846.167	1.3670930	0.171604
		4		6
SellerGAumeca	-40629.677	392794.923	-	0.917616
		1	0.1034374	4
SellerGAusin	88371.905	392661.567	0.2250587	0.821934
		7		9
SellerGAussie	14759.175	392770.435	0.0375771	0.970025
		2		1
SellerGAustralian	-	392753.347	-	0.525835
	249155.537	2	0.6343817	7
SellerGAuv	-35019.836	392745.998	-	0.928950
		3	0.0891666	0
SellerGAvion	300741.977	392932.126	0.7653789	0.444050
		6		9

SellerGBarlow	216496.697	105480.719	2.0524765	0.040130
		9		5
SellerGBarry	53578.637	88203.9437	0.6074404	0.543562
				5
SellerGBatty	91952.965	392833.535	0.2340762	0.814927
		6		2
SellerGBayside	-87763.944	132628.439	-	0.508149
		3	0.6617279	8
SellerGBekdon	171134.840	120156.396	1.4242674	0.154377
		1		7
SellerGBell	423136.871	398581.328	1.0616074	0.288421
		7		0
SellerGBeller	-	109571.591	-	0.233732
	130480.012	3	1.1908197	1
SellerGBells	47804.939	95416.4415	0.5010136	0.616364
				6
SellerGBelmar	115444.033	285171.811	0.4048227	0.685610
		0		2
SellerGBenchmark	-66643.912	238017.038	-	0.779481
		9	0.2799964	9
SellerGBenlor	254294.379	150108.224	1.6940736	0.090259
		3		9
SellerGBesser	-	210776.857	-	0.350004
	196990.625	7	0.9345932	2
SellerGBetter	-93338.133	392712.412	-	0.812134
		7	0.2376755	1
SellerGBiggin	91955.245	89312.3463	1.0295916	0.303208
				6
SellerGBlackbird	329756.769	285307.417	1.1557946	0.247772
		0		8
SellerGBlue	888949.179	392770.282	2.2632801	0.023624
		4		3
SellerGBombay	225745.887	237874.472	0.9490127	0.342620
		2		5
SellerGBoran	-87803.229	237841.539	-	0.712005
		8	0.3691669	5
SellerGBoutique	-50731.635	156175.264	-	0.745305
		8	0.3248378	7
SellerGBowman	-3603.123	133609.943	-	0.978485
		9	0.0269675	8

SellerGBrace	-69887.046	149798.159	-	0.640830
		0	0.4665414	8
SellerGBrad	83242.420	89316.9850	0.9319887	0.351348
				6
SellerGBranon	-11180.010	145317.053	-	0.938675
		7	0.0769353	4
SellerGBuckingham	123483.708	92503.5387	1.3349079	0.181914
				8
SellerGBullen	43010.090	284605.099	0.1511220	0.879880
		1		3
SellerGBurnham	58116.682	99125.0460	0.5862966	0.557679
				8
SellerGBurns	-	238134.562	-	0.431089
	187492.165	9	0.7873371	7
SellerGBuxton	109936.653	88681.7655	1.2396760	0.215103
				3
SellerGBuxton/Advantage	-94158.664	392801.264	-	0.810555
		9	0.2397107	9
SellerGBuxton/Buxton	63120.018	284698.778	0.2217081	0.824542
		8		4
SellerGBuxton/Find	181732.076	393123.829	0.4622769	0.643885
		8		5
SellerGBuxton/Hodges	330010.541	392696.972	0.8403695	0.400706
		1		8
SellerGBuxton/Marshall	960963.525	284571.100	3.3768838	0.000733
		5		9
SellerGbuyMyplace	94322.248	161435.258	0.5842729	0.559040
		1		3
SellerGC	45642.276	285325.744	0.1599655	0.872909
		8		1
SellerGC21	8680.671	92090.2619	0.0942626	0.924901
				0
SellerGCaine	812706.168	110798.492	7.3349930	0.000000
		5		0
SellerGCalder	10759.608	141503.020	0.0760380	0.939389
		3		3
SellerGCarlinSmith	127706.110	392757.739	0.3251524	0.745067
		1		6
SellerGCarter	106078.376	105276.924	1.0076128	0.313647
		1		1

SellerGCastran	631146.972	115124.996	5.4822757	0.000000
		1		0
SellerGCayzer	314858.319	98848.9312	3.1852476	0.001447
				5
SellerGCentury	-	116804.049	-	0.342216
	110941.461	2	0.9498084	0
SellerGChambers	211617.007	120156.958	1.7611715	0.078217
		9		8
SellerGCharlton	76554.171	105290.859	0.7270733	0.467185
		4		8
SellerGCharter	43618.032	237860.005	0.1833769	0.854503
		2		3
SellerGChisholm	230948.530	94437.0675	2.4455284	0.014468
				7
SellerGChristopher	-41571.376	161540.857	-	0.796915
		4	0.2573428	6
SellerGCoad	-	237935.131	-	0.408533
	196650.170	4	0.8264865	6
SellerGCollin	81563.287	392659.315	0.2077202	0.835448
		0		6
SellerGCollings	8289.283	154953.123	0.0534954	0.957337
		0		5
SellerGCollins	295564.042	96115.1022	3.0751051	0.002105
				8
SellerGCommunity	109167.564	131466.493	0.8303832	0.406327
		2		6
SellerGCompton	166311.511	121933.519	1.3639524	0.172591
		4		0
SellerGConley	41515.430	392770.900	0.1056988	0.915821
		8		9
SellerGConquest	237292.843	392823.660	0.6040696	0.545801
		9		1
SellerGConsidine	-35171.517	101948.367	-	0.730101
		4	0.3449934	3
SellerGCoventry	-	392758.455	-	0.409976
	323611.179	7	0.8239445	5
SellerGCraig	32059.159	284627.769	0.1126354	0.910320
		4		3
SellerGCrane	72572.825	210588.276	0.3446195	0.730382
		9		4

SellerGCreate	-34367.113	210776.516	-	0.870480
		6	0.1630500	0
SellerGD'Aprano	-33379.067	169538.684	-	0.843921
		6	0.1968817	2
SellerGDaniel	90622.468	132687.899	0.6829746	0.494627
		2		2
SellerGDarras	393949.613	155413.866	2.5348421	0.011254
		7		0
SellerGDarren	189052.589	92847.3724	2.0361652	0.041741
				0
SellerGDavid	-49428.647	210754.978	-	0.814573
		6	0.2345313	8
SellerGDavita	-92019.836	392745.998	-	0.814754
		3	0.2342986	5
SellerGDawson	192166.884	284658.049	0.6750797	0.499629
		1		4
SellerGDel	-25109.667	111997.797	-	0.822604
		1	0.2241979	6
SellerGDingle	-34224.312	106696.411	-	0.748391
		3	0.3207635	5
SellerGDixon	-	192613.342	-	0.324686
	189702.389	8	0.9848871	1
SellerGDomain	-	128104.029	-	0.332294
	124198.817	6	0.9695153	6
SellerGDonovan	-	162323.529	-	0.345138
	153245.248	7	0.9440729	7
SellerGDouglas	38153.397	92594.2459	0.4120493	0.680305
				7
SellerGEdward	33164.303	103247.985	0.3212102	0.748053
		1		0
SellerGElite	355116.750	284581.351	1.2478567	0.212091
		8		6
SellerGEmerson	79730.786	284981.163	0.2797756	0.779651
		6		2
SellerGView	39161.242	92950.0155	0.4213151	0.673527
				5
SellerGEvolve	25298.901	392518.082	0.0644528	0.948610
		3		0
SellerGFirst	-58107.481	179335.181	-	0.745927
		2	0.3240161	7



SellerGFlanagan	272660.751	392779.882	0.6941821	0.487572
		3		5
SellerGFlannagan	92866.627	121563.511	0.7639350	0.444910
		5		9
SellerGFletchers	115077.765	89074.4613	1.2919277	0.196390
				4
SellerGFletchers/Fletchers	-	145467.293	-	0.263443
	162676.869	1	1.1183055	9
SellerGFletchers/Jellis	-	284557.066	-	0.708254
	106482.647	6	0.3742049	1
SellerGFN	115113.737	96214.3215	1.1964304	0.231536
				5
SellerGFollett	332691.576	284693.332	1.1685963	0.242574
		9		0
SellerGFor	2034470.70	392715.660	5.1805184	0.000000
	1	4		2
SellerGFrank	134671.868	96495.8835	1.3956229	0.162836
				6
SellerGFull	106691.253	392731.969	0.2716643	0.785881
		1		7
SellerGG&H	171489.339	392696.964	0.4366964	0.662334
		4		2
SellerGGalldon	-30992.609	179517.110	-	0.862932
		7	0.1726443	0
SellerGGardiner	101022.798	143746.990	0.7027820	0.482196
		4		1
SellerGGarvey	-39361.638	169532.983	-	0.816401
		0	0.2321769	9
SellerGGary	33904.237	90592.5721	0.3742496	0.708220
				8
SellerGGellibrand	-	392655.732	-	0.231248
	470075.408	0	1.1971694	4
SellerGGeoff	-	392801.812	-	0.478491
	278393.986	9	0.7087391	0
SellerGGL	-21717.458	108016.128	-	0.840654
		6	0.2010576	7
SellerGGold	57119.904	284769.823	0.2005827	0.841026
		6		0
SellerGGr8	-	394407.460	-	0.210346
	494048.285	9	1.2526342	9

SellerGGrant's	12131.213	193698.440	0.0626294	0.950062
		0		0
SellerGGrantham	-24694.582	237836.926	-	0.917304
		1	0.1038299	9
SellerGGreg	182232.278	90003.2975	2.0247289	0.042902
				5
SellerGgunn&Co	46632.935	125153.848	0.3726049	0.709444
		2		7
SellerGH	119556.712	392704.590	0.3044444	0.760791
		9		1
SellerGHall	256851.457	113404.900	2.2649061	0.023524
		8		3
SellerGHam	-70300.325	149781.848	-	0.638821
		5	0.4693514	3
SellerGHamilton	16569.532	210677.372	0.0786488	0.937312
		4		4
SellerGHAR	75480.149	90083.5662	0.8378903	0.402097
				8
SellerGHarcourts	77804.862	89342.2699	0.8708628	0.383834
				8
SellerGHarcourts/Harcourts	19190.818	393039.535	0.0488267	0.961057
		6		7
SellerGHarrington	56028.400	111222.368	0.5037512	0.614439
		3		3
SellerGHarrison	5773.038	392511.993	0.0147079	0.988265
		3		3
SellerGHaughton	-39835.321	114411.923	-	0.727711
		5	0.3481746	1
SellerGHaven	145029.303	394383.859	0.3677364	0.713071
		9		9
SellerGHayeswinckle	36382.302	284699.465	0.1277920	0.898314
		8		3
SellerGhockingstuart	65411.143	88388.3210	0.7400428	0.459278
				8
SellerGhockingstuart/Advantage	212965.231	392675.337	0.5423443	0.587584
		6		7
SellerGhockingstuart/Barry	120949.658	284531.678	0.4250833	0.670778
		7		5
SellerGhockingstuart/Biggin	102337.261	392816.292	0.2605219	0.794462
		5		7

SellerGhockingstuart/Harcourts	24751.959	392708.188	0.0630289	0.949743
		7		9
SellerGhockingstuart/hockingstuart	165504.803	106487.929	1.5542119	0.120142
		5		6
SellerGhockingstuart/Jellis	-	392651.235	-	0.714412
	143686.464	3	0.3659392	6
SellerGhockingstuart/Kerr	139390.890	392653.965	0.3549968	0.722594
		6		1
SellerGhockingstuart/Marshall	642339.399	392656.458	1.6358814	0.101873
		0		1
SellerGhockingstuart/Sweeney	113875.938	392819.110	0.2898941	0.771898
		3		9
SellerGhockingstuart/Village	363098.245	392832.888	0.9243071	0.355332
		3		6
SellerGHodges	99661.855	89860.8776	1.1090684	0.267408
				0
SellerGHodges/Buxton	531517.906	392728.552	1.3533977	0.175937
		2		0
SellerGHodges/Hodges	385268.718	284674.780	1.3533644	0.175947
		5		7
SellerGHolland	87858.018	145217.499	0.6050098	0.545176
		6		2
SellerGHome	180047.780	155519.469	1.1577186	0.246986
		9		5
SellerGHomes	-49181.419	179528.267	-	0.784126
		1	0.2739481	1
SellerGHooper	1464743.87	392662.196	3.7302900	0.000191
	4	0		6
SellerGHoskins	94139.024	132656.318	0.7096460	0.477928
		4		3
SellerGHume	-83161.488	392525.011	-	0.832215
		8	0.2118629	2
SellerGHunter	37216.568	123658.771	0.3009618	0.763445
		5		3
SellerGIcon	253772.502	392772.095	0.6461062	0.518214
		7		6
SellerGIconek	33447.355	104098.103	0.3213061	0.747980
		3		3
SellerGiHomes	145296.251	237910.428	0.6107183	0.541389
		7		9

SellerGiOne	-33207.100	392822.530	-	0.932631
		7	0.0845346	9
SellerGiProperty	203878.327	392860.835	0.5189581	0.603793
		9		1
SellerGiSell	-11698.251	100549.679	-	0.907381
		4	0.1163430	4
SellerGiTRAK	132129.265	104039.855	1.2699870	0.204097
		7		4
SellerGJ	102060.753	117892.658	0.8657091	0.386655
		9		4
SellerGJacobs	-	393034.657	-	0.786738
	106335.512	8	0.2705500	7
SellerGJamie	218651.386	392654.651	0.5568542	0.577630
		0		5
SellerGJanice	181124.787	392693.911	0.4612366	0.644631
		4		7
SellerGJas	145697.978	90664.2121	1.6070065	0.108061
				6
SellerGJason	41849.546	96529.4376	0.4335418	0.664623
				8
SellerGJellis	199412.249	88374.6376	2.2564421	0.024048
				9
SellerGJim	78334.790	238014.791	0.3291173	0.742068
		8		9
SellerGJK	244706.110	392757.739	0.6230459	0.533258
		1		3
SellerGJMRE	-56699.565	192586.009	-	0.768445
		9	0.2944117	0
SellerGJohnston	175385.665	237966.106	0.7370195	0.461115
		6		2
SellerGJoseph	140166.637	237848.517	0.5893105	0.555656
		1		6
SellerGJRW	57893.535	130178.844	0.4447231	0.656522
		4		5
SellerGJust	22727.151	212107.043	0.1071494	0.914671
		8		0
SellerGJustin	-	193043.995	-	0.000000
	1227140.93	9	6.3567941	0
	6			

SellerGJY	42692.671	284619.788	0.1499990	0.880766
		9		3
SellerGK.R.Peters	114199.202	210782.337	0.5417873	0.587968
		3		3
SellerGKay	724627.801	92046.5278	7.8724078	0.000000
				0
SellerGKaye	65991.025	247553.629	0.2665726	0.789799
		5		7
SellerGKeatings	685928.454	395520.321	1.7342433	0.082883
		6		4
SellerGKen	-93062.198	238119.343	-	0.695931
		3	0.3908217	4
SellerGKennedy	504357.857	288571.934	1.7477717	0.080512
		3		0
SellerGKontek	327256.769	393150.029	0.8323967	0.405190
		2		6
SellerGL	331469.413	180624.633	1.8351285	0.066494
		3		8
SellerGLandfield	-	392715.526	-	0.382655
	342850.594	2	0.8730253	1
SellerGLangwell	-67103.776	210630.478	-	0.750042
		5	0.3185853	8
SellerGLE	136473.904	139650.293	0.9772547	0.328449
		1		6
SellerGLeaders	-86793.776	284659.543	-	0.760441
		2	0.3049038	2
SellerGLeading	342072.861	180598.269	1.8941093	0.058218
		7		4
SellerGLEased	145293.614	192355.702	0.7553382	0.450051
		0		0
SellerGLEeburn	367931.363	121991.166	3.0160492	0.002562
		0		7
SellerGLen	464457.461	431255.224	1.0769898	0.281492
		8		0
SellerGLeyton	50221.961	136285.659	0.3685051	0.712498
		7		8
SellerGLindellas	303135.518	109351.970	2.7721084	0.005572
		5		3
SellerGLittle	-	392772.095	-	0.573270
	221227.498	7	0.5632465	5

SellerGLITTLE	-71053.446	98202.3705	-	0.469352
			0.7235411	2
SellerGLJ	30256.181	93092.5015	0.3250120	0.745173
				9
SellerGLJH	14950.895	179419.927	0.0833291	0.933590
		9		3
SellerGLLC	449821.282	130225.546	3.4541708	0.000552
		6		6
SellerGLove	85188.695	90798.8314	0.9382136	0.348140
				9
SellerGLucas	197072.982	238025.440	0.8279492	0.407704
		1		7
SellerGLuxe	-	392804.205	-	0.310549
	398336.203	6	1.0140833	7
SellerGLuxton	50594.802	284459.264	0.1778631	0.858831
		1		5
SellerGM.J	103819.007	121709.990	0.8530032	0.393663
		4		2
SellerGMaddison	-	192577.231	-	0.484114
	134747.872	6	0.6997082	0
SellerGMaitland	-37273.551	135197.090	-	0.782781
		9	0.2756979	7
SellerGMandy	89860.123	210627.876	0.4266298	0.669651
		6		5
SellerGMark	343784.822	398504.595	0.8626872	0.388315
		7		2
SellerGMarket	40126.551	392807.158	0.1021533	0.918635
		5		6
SellerGMarshall	514115.125	88942.2675	5.7803240	0.000000
				0
SellerGMason	55164.335	118647.566	0.4649428	0.641975
		3		2
SellerGMatthew	-16240.011	238007.995	-	0.945600
		8	0.0682330	5
SellerGMax	237170.530	110839.065	2.1397738	0.032379
		1		7
SellerGMcDonald	173199.908	97562.9719	1.7752627	0.075862
				9
SellerGMcEwing	291164.488	285148.415	1.0210980	0.307214
		6		8

SellerG McGrath	148350.883	89373.5651	1.6598967	0.0969439
SellerG McGrath/Langwell	-66265.406	284836.7971	- 0.2326434	0.8160396
SellerG McLennan	29991.726	121402.6033	0.2470435	0.8048759
SellerG Meadows	9390.890	392653.9656	0.0239165	0.9809194
SellerG Meallin	- 182907.694	392698.2627	- 0.4657716	0.6413818
SellerG Mega	491795.038	392687.4044	1.2523830	0.2104384
SellerG Melbourne	-94407.537	109773.3820	- 0.8600221	0.3897825
SellerG Methven	-89718.237	286731.7247	- 0.3128996	0.7543588
SellerG Metro	-48560.992	284780.4624	- 0.1705208	0.8646015
SellerG MICM	-39270.024	97986.1478	- 0.4007712	0.6885910
SellerG Miles	243497.159	90878.3980	2.6793734	0.0073793
SellerG Millership	37783.400	100386.3847	0.3763797	0.7066368
SellerG Mindacom	545757.822	394664.8288	1.3828388	0.1667228
SellerG Mitchell	-74700.978	238181.0902	- 0.3136310	0.7538031
SellerG MJ	65577.609	169523.7637	0.3868343	0.6988811
SellerG Moonee	-60609.246	98700.2771	- 0.6140737	0.5391705
SellerG Morleys	- 195838.428	145369.6590	- 1.3471754	0.1779322
SellerG Morrison	179047.449	92755.7279	1.9303115	0.0535760
SellerG Munn	-87805.106	155789.5134	- 0.5636137	0.5730205
SellerG Naison	80850.075	392802.4384	0.2058289	0.8369258

SellerGNardella	193240.116	392749.352 2	0.4920189	0.622708 9
SellerGNelson	122009.093	88403.5459	1.3801380	0.167552 7
SellerGNew	- 111138.044	149709.785 4	- 0.7423566	0.457876 1
SellerGNexus	- 164776.270	193671.437 9	- 0.8508032	0.394884 3
SellerGNguyen	61488.056	192598.957 1	0.3192544	0.749535 5
SellerGNicholls	171496.984	285074.651 2	0.6015862	0.547453 4
SellerGNicholson	161681.398	132414.617 9	1.2210238	0.222084 9
SellerGNick	525794.710	98504.3751	5.3377803	0.000000 1
SellerGNoel	97359.390	89569.7024	1.0869679	0.277058 2
SellerGNorth	692147.415	392656.858 1	1.7627284	0.077954 7
SellerGO'Brien	10804.839	90454.8670	0.1194501	0.904919 5
SellerGO'Donoghues	-72822.113	155169.541 2	- 0.4693067	0.638853 2
SellerGOak	79741.977	392932.126 6	0.2029408	0.839182 4
SellerGObrien	48662.504	126336.660 5	0.3851812	0.700105 4
SellerGOBrien	12938.125	126210.961 9	0.1025119	0.918350 9
SellerGOne	136390.169	111302.883 0	1.2253966	0.220433 8
SellerGOnly	116985.630	239380.504 6	0.4887016	0.625055 9
SellerGOpen	- 110839.096	284573.330 9	- 0.3894922	0.696914 4
SellerGOriental	-43006.273	284769.956 3	- 0.1510211	0.879959 9
SellerGOutlook	202652.521	284620.211 1	0.7120103	0.476463 0



SellerGOwen	-	210686.088	-	0.343720
	199488.361	4	0.9468511	9
SellerGP	24856.527	192559.886	0.1290847	0.897291
		4		4
SellerGPagan	52718.690	106244.474	0.4962017	0.619755
		4		1
SellerGParkes	173935.676	109068.703	1.5947350	0.110780
		8		2
SellerGParkinson	662870.034	284855.449	2.3270400	0.019968
		4		6
SellerGPaul	260675.930	130323.102	2.0002281	0.045483
		1		1
SellerGPavilion	317089.144	392824.734	0.8072026	0.419555
		6		1
SellerGPeake	526587.428	195803.977	2.6893602	0.007162
		9		2
SellerGPellegrino	-	392768.113	-	0.776567
	111466.303	4	0.2837967	8
SellerGPeople	175255.239	392693.707	0.4462899	0.655390
		2		5
SellerGPeter	2272.437	102612.372	0.0221458	0.982331
		3		7
SellerGPhilip	102965.392	92217.4969	1.1165494	0.264194
				4
SellerGPoint	28308.231	118367.309	0.2391558	0.810986
		3		1
SellerGPRD	181401.301	284642.799	0.6372945	0.523937
		2		0
SellerGPRDNationwide	-17150.457	113770.302	-	0.880176
		0	0.1507463	6
SellerGPride	121799.947	138503.106	0.8794023	0.379189
		5		0
SellerGPrime	-	392719.182	-	0.791381
	103881.831	1	0.2645194	2
SellerGPrivate/Tiernan's	399875.021	392698.218	1.0182756	0.308553
		2		8
SellerGProf	-	284459.885	-	0.247882
	328701.152	8	1.1555273	2
SellerGProf.	80313.955	94399.1993	0.8507906	0.394891
				3

SellerGProfessionals	-59813.142	117531.793	-	0.610818
		7	0.5089103	2
SellerGProperty	232070.756	128199.471	1.8102318	0.070268
		8		1
SellerGPropertyau	-	392710.064	-	0.071836
	706959.420	4	1.8002070	2
SellerGProwse	-	237938.015	-	0.515045
	154899.681	7	0.6510085	1
SellerGPSP	130706.110	392757.739	0.3327907	0.739294
		1		2
SellerGPurplebricks	-3038.518	93453.0957	-	0.974062
			0.0325138	5
SellerGQuinta	125154.789	284884.241	0.4393180	0.660433
		7		7
SellerGR&H	2174.884	169399.937	0.0128388	0.989756
		7		5
SellerGRaine	62976.648	90224.5297	0.6979992	0.485182
				2
SellerGRaine&Horne	-74653.676	284970.529	-	0.793346
		7	0.2619698	2
SellerGRay	17074.516	88277.3762	0.1934189	0.846632
				0
SellerGRe	-48038.551	154993.880	-	0.756609
		7	0.3099384	6
SellerGRE	56029.822	109672.921	0.5108811	0.609437
		4		4
SellerGReach	-	179329.521	-	0.481091
	126347.619	8	0.7045556	4
SellerGReal	77286.468	284468.333	0.2716874	0.785863
		9		9
SellerGRed	161943.042	149549.590	1.0828719	0.278872
		3		5
SellerGRedina	-54172.331	284639.048	-	0.849059
		4	0.1903194	9
SellerGReed	31063.714	284618.973	0.1091414	0.913090
		4		9
SellerGRegal	-55150.075	392512.794	-	0.888261
		4	0.1405052	7
SellerGReliance	42458.956	106638.863	0.3981565	0.690517
		0		2

SellerGREMAX	-63296.134	151395.456	-	0.675887
		7	0.4180848	6
SellerGRendina	76000.270	96073.9652	0.7910600	0.428914
				1
SellerGRexhepi	127536.538	285812.560	0.4462244	0.655437
		2		8
SellerGRichardson	-76319.753	392752.100	-	0.845926
		1	0.1943204	1
SellerGRistic	6595.448	210858.949	0.0312790	0.975047
		2		2
SellerGRodney	127293.708	118016.506	1.0786094	0.280769
		6		1
SellerGRoger	212991.183	238048.602	0.8947382	0.370933
		5		0
SellerGRombotis	82007.510	284611.179	0.2881388	0.773242
		1		2
SellerGRosin	104382.050	284568.801	0.3668078	0.713764
		8		5
SellerGRoss	-71745.239	169437.939	-	0.671983
		8	0.4234308	5
SellerGRounds	215866.803	210691.638	1.0245627	0.305576
		2		4
SellerGRT	394407.479	90429.0062	4.3615151	0.000013
				0
SellerGRuralco	116606.852	403420.036	0.2890458	0.772548
		1		0
SellerGRW	38891.759	90177.1618	0.4312817	0.666266
				1
SellerGRyder	1456.933	129993.877	0.0112077	0.991057
		1		8
SellerGS&L	172647.707	114936.489	1.5021140	0.133076
		9		4
SellerGSanctuary	113520.766	284775.000	0.3986332	0.690165
		0		8
SellerGSandhurst	-	393049.979	-	0.484367
	274860.908	9	0.6993027	4
SellerGSavoy	-39193.696	393172.305	-	0.920594
		8	0.0996858	3
SellerGSchroeder	115893.818	112836.632	1.0270939	0.304383
		2		1

SellerGScott	-	155051.429	-	0.232954
	184945.672	7	1.1928021	7
SellerGSell	232470.594	179637.222	1.2941115	0.195635
		4		1
SellerGShape	-	284827.388	-	0.344249
	269393.986	0	0.9458149	3
SellerGSilver	102383.200	392815.388	0.2606395	0.794372
		1		0
SellerGSkad	77672.274	169239.320	0.4589493	0.646273
		2		3
SellerGSN	-	392878.222	-	0.205075
	497873.061	7	1.2672452	7
SellerGSotheby's	1864229.61	149817.640	12.443325	0.000000
	6	2	2	0
SellerGSteller	209102.558	192575.477	1.0858213	0.277565
		9		3
SellerGSteveway	-6050.821	392770.282	-	0.987708
		4	0.0154055	8
SellerGStockdale	8250.010	89461.5071	0.0922185	0.926524
				9
SellerGSurreal	-	284687.602	-	0.483596
	199434.157	7	0.7005369	6
SellerGSutherland	-	393518.223	-	0.493297
	269591.958	9	0.6850813	0
SellerGSweeney	102156.155	90356.0664	1.1305954	0.258232
				9
SellerGSweeney/Burnham	73611.059	392821.142	0.1873908	0.851355
		3		3
SellerGT	772638.625	393047.734	1.9657628	0.049333
		1		6
SellerGThe	253940.989	112480.225	2.2576501	0.023973
		4		4
SellerGThomas	91211.627	128154.997	0.7117290	0.476637
		1		2
SellerGThomson	53094.709	96385.7483	0.5508564	0.581735
				5
SellerGTiernan's	-	392718.837	-	0.760902
	119503.436	2	0.3042977	8
SellerGTim	-56610.847	113384.493	-	0.617583
		2	0.4992821	7

SellerGTown	12438.248	392778.178	0.0316674	0.974737
		7		5
SellerGTrimson	36701.054	138445.425	0.2650940	0.790938
		3		5
SellerGTriwest	37311.791	124931.548	0.2986579	0.765202
		0		8
SellerGTRUE	4084.248	393339.762	0.0103835	0.991715
		2		4
SellerGTTS	-48008.556	392701.701	-	0.902700
		3	0.1222520	1
SellerGU	63827.102	116425.702	0.5482217	0.583543
		3		0
SellerGUFIRST	-64029.025	394621.442	-	0.871106
		8	0.1622543	5
SellerGUnited	168780.411	237943.469	0.7093299	0.478124
		2		3
SellerGUnity	24099.842	392798.954	0.0613541	0.951077
		5		5
SellerGUpper	613952.660	392782.140	1.5630870	0.118040
		5		8
SellerGUpSide	99368.183	149567.694	0.6643693	0.506458
		1		2
SellerGVic	36606.541	392693.654	0.0932191	0.925730
		7		0
SellerGVicHomes	-6553.905	393172.941	-	0.986700
		1	0.0166693	6
SellerGVicprop	125736.026	392784.910	0.3201142	0.748883
		7		6
SellerGVICProp	826656.499	192474.957	4.2948782	0.000017
		8		5
SellerGVICPROP	-22457.273	155119.203	-	0.884889
		7	0.1447743	9
SellerGVictory	-	392758.455	-	0.313203
	396111.179	7	1.0085363	8
SellerGVillage	155210.652	93531.6489	1.6594453	0.097034
				7
SellerGvoglwalpale	496483.994	392832.966	1.2638552	0.206290
		7		1
SellerGW.B.	-9953.393	138386.402	-	0.942662
		6	0.0719246	3

SellerGWalsh	-17979.596	192464.812	-	0.925572
		8	0.0934176	3
SellerGWalshe	46202.416	98702.2505	0.4680989	0.639716
				7
SellerGWeda	271690.666	192640.908	1.4103477	0.158445
		2		6
SellerGWeston	4853.077	237887.729	0.0204007	0.983723
		4		8
SellerGWestside	6823.816	128245.182	0.0532091	0.957565
		5		6
SellerGWhite	602965.722	392816.496	1.5349807	0.124797
		2		3
SellerGWHITEFOX	578077.856	238027.422	2.4286187	0.015161
		3		3
SellerGWhiting	-75259.552	111330.282	-	0.499043
		7	0.6760025	4
SellerGWilliam	-93294.205	115382.060	-	0.418769
		6	0.8085677	2
SellerGWilliams	209138.933	93307.7616	2.2413884	0.025006
				9
SellerGWilson	168242.046	108314.292	1.5532765	0.120365
		4		8
SellerGWin	-75870.963	100883.238	-	0.452015
		5	0.7520671	6
SellerGWood	-39497.763	237857.006	-	0.868113
		9	0.1660568	2
SellerGWoodards	92543.496	89429.1681	1.0348245	0.300757
				8
SellerGWoodards/Peter	183198.563	392679.593	0.4665345	0.640835
		6		8
SellerGWyndham	28861.265	145478.401	0.1983887	0.842742
		5		1
SellerGXynergy	-	392695.462	-	0.727031
	137082.172	2	0.3490801	2
SellerGYPA	25652.271	89068.5946	0.2880058	0.773344
				0
SellerGZahn	69797.809	285668.043	0.2443319	0.806975
		7		2
SellerGZed	329498.250	285065.854	1.1558671	0.247743
		7		1

CouncilAreaBayside City Council	719363.061	20396.9164	35.268226 3	0.000000 0
CouncilAreaBoroondara City Council	645212.677	19075.7404	33.823729 2	0.000000 0
CouncilAreaBrimbank City Council	- 127216.395	27783.4655	- 4.5788527	0.000004 7
CouncilAreaCardinia Shire Council	473967.947	83588.6870	5.6702404	0.000000 0
CouncilAreaCasey City Council	279526.439	37355.8148	7.4828093	0.000000 0
CouncilAreaDarebin City Council	160410.251	15882.2733	10.099955 3	0.000000 0
CouncilAreaFrankston City Council	530288.631	33578.3554	15.792573 1	0.000000 0
CouncilAreaGlen Eira City Council	442804.967	20226.9328	21.891849 4	0.000000 0
CouncilAreaGreater Dandenong City Council	227560.384	32532.4589	6.9948719	0.000000 0
CouncilAreaHobsons Bay City Council	62849.993	31774.8783	1.9779775	0.047938 8
CouncilAreaHume City Council	-54372.672	17873.5140	- 3.0420807	0.002351 2
CouncilAreaKingston City Council	443849.389	24186.1485	18.351387 7	0.000000 0
CouncilAreaKnox City Council	56918.859	22429.9046	2.5376327	0.011164 6
CouncilAreaMacedon Ranges Shire Council	570493.700	69356.6765	8.2255052	0.000000 0
CouncilAreaManningham City Council	177666.248	16872.7430	10.529778 6	0.000000 0
CouncilAreaMaribyrnong City Council	-16691.968	30823.7910	- 0.5415287	0.588146 5
CouncilAreaMaroondah City Council	99721.257	20883.8320	4.7750459	0.000001 8
CouncilAreaMelbourne City Council	308046.359	18381.1317	16.758835 3	0.000000 0
CouncilAreaMelton City Council	- 121063.146	34931.4159	- 3.4657383	0.000529 4
CouncilAreaMitchell Shire Council	299841.164	105675.318 4	2.8373812	0.004551 0

CouncilAreaMonash City Council	320419.151	16688.2161	19.2003237	0.0000000
CouncilAreaMoonee Valley City Council	198853.310	28839.6582	6.8951341	0.0000000
CouncilAreaMoorabool Shire Council	153800.542	184174.1596	0.8350821	0.4036770
CouncilAreaMoreland City Council	120904.422	16930.8409	7.1410760	0.0000000
CouncilAreaMurrindindi Shire Council	773257.936	385872.8329	2.0039191	0.0450861
CouncilAreaNillumbik Shire Council	-67173.422	51780.9269	-1.2972619	0.1945493
CouncilAreaPort Phillip City Council	432760.634	22436.9753	19.2878331	0.0000000
CouncilAreaStonnington City Council	675496.423	22085.2136	30.5859130	0.0000000
CouncilAreaWhitehorse City Council	177398.050	18478.7617	9.6001049	0.0000000
CouncilAreaWhittlesea City Council	1814.996	18623.1107	0.0974593	0.9223622
CouncilAreaWyndham City Council	-167685.008	29851.8991	-5.6172308	0.0000000
CouncilAreaYarra City Council	310057.206	20226.0854	15.3295707	0.0000000
CouncilAreaYarra Ranges Shire Council	166521.768	55782.5873	2.9851926	0.0028359

*#Diagnostic plots*

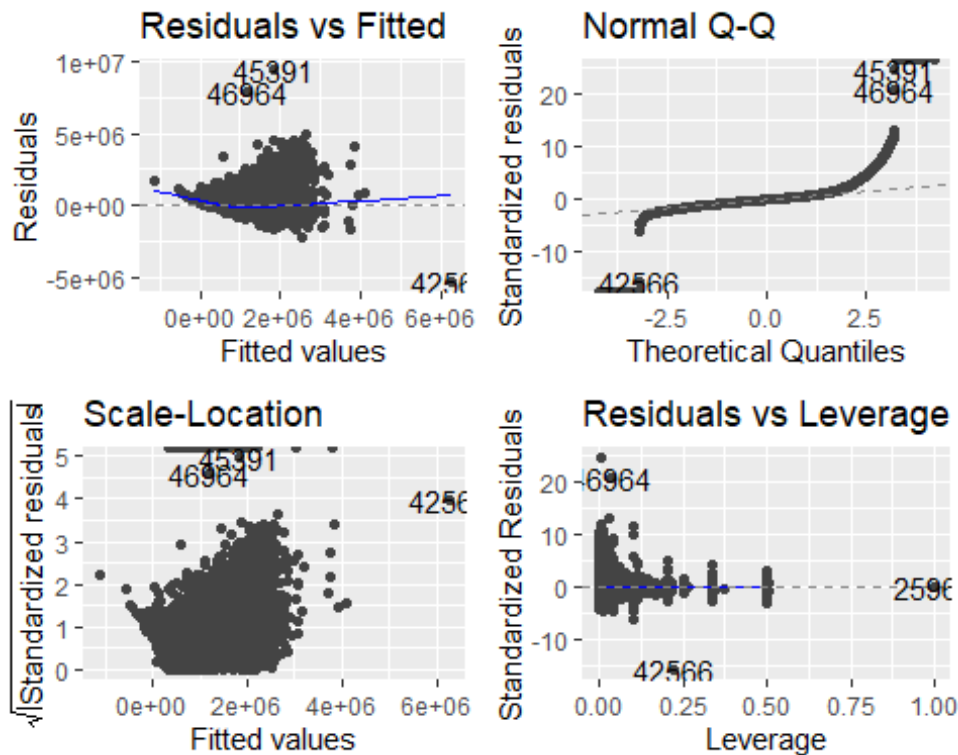
**autoplot**(Ful.Model)

## Warning: Removed 36746 row(s) containing missing values (geom\_path).

## Warning: Removed 48 rows containing missing values (geom\_point).

## Warning: Removed 186 row(s) containing missing values (geom\_path).





#Training data performance metric test

```
# Compute R^2 from true and predicted values
eval_results <- function(true, predicted, df) {
  SSE <- sum((predicted - true)^2)
  SST <- sum((true - mean(true))^2)
  R_square <- 1 - SSE / SST
  RMSE = sqrt(SSE/nrow(df))

  # Model performance metrics
  data.frame(
    RMSE = RMSE,
    Rsquare = R_square
  )
}

# Prediction and evaluation on train data
predictions_training <- predict(Ful.Model)
eval_results(training$Price, predictions_training, training)

##          RMSE  Rsquare
## 1 380306.2 0.608659
```

## Test model

```
test<-na.omit(test)
Ful.Model1<-lm(Price~Distance+Type+Rooms+Regionname+SellerG+CouncilArea,data=
```

```
test)
Modell1<-summary(Ful.Modell1)
kable(Modell1$coefficients,caption="Table10: Multiple Regression Train Coefficients")
```

Table10: Multiple Regression Train Coefficients

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	569912.219	238334.67	2.3912266	0.016808
	0	9		4
Distance	-	1240.061	-	0.000000
	26196.0759		21.124820	0
			3	
Typet	-	10846.829	-	0.000000
	224475.461		20.695031	0
	7		5	
Typeu	-	10042.674	-	0.000000
	410181.548		40.843856	0
	1		2	
Rooms	230554.252	4269.288	54.002970	0.000000
	9		9	0
RegionnameEastern Victoria	-	71411.468	-	0.327906
	69867.6303		0.9783811	7
RegionnameNorthern Metropolitan	-	23078.175	-	0.000000
	151598.562		6.5689146	0
	1			
RegionnameNorthern Victoria	116149.230	80961.694	1.4346196	0.151423
	6			1
RegionnameSouth-Eastern Metropolitan	-	29263.158	-	0.000179
	109673.308		3.7478289	3
	9			
RegionnameSouthern Metropolitan	-	24091.064	-	0.000004
	110356.782		4.5808182	7
	9			
RegionnameWestern Metropolitan	-	39921.567	-	0.003246
	117530.327		2.9440309	2
	9			
RegionnameWestern Victoria	60137.4492	79833.686	0.7532841	0.451294
				8
SellerGA	-	334761.31	-	0.916202
	35223.7702	8	0.1052206	7

SellerGAbercromby's	485369.969 1	262162.69 2	1.8514075	0.064136 9
SellerGAce	- 62805.2843	410524.73 6	- 0.1529878	0.878410 6
SellerGAIME	- 262653.651 1	410570.61 5	- 0.6397283	0.522362 2
SellerGAirport	- 491803.423 9	410359.50 4	- 1.1984697	0.230759 2
SellerGAlex	- 136916.792 9	418906.95 4	- 0.3268430	0.743792 7
SellerGAlexkarbon	- 73509.9504	249036.41 4	- 0.2951775	0.767863 7
SellerGAllan	- 203326.285 0	410233.20 6	- 0.4956359	0.620161 0
SellerGAllens	- 237618.794 1	280494.77 0	- 0.8471416	0.396934 1
SellerGAnderson	198747.518 6	335841.31 9	0.5917900	0.554003 0
SellerGAppleby	- 80334.1064	306049.04 6	- 0.2624877	0.792950 2
SellerGAquire	198647.434 1	275418.17 7	0.7212575	0.470765 9
SellerGARbee	- 19320.0703	474553.28 4	- 0.0407121	0.967526 1
SellerGArea	22162.6702	256997.31 4	0.0862370	0.931279 6
SellerGAscend	30463.7789	410050.43 8	0.0742928	0.940778 7
SellerGASL	98712.3010	334740.09 7	0.2948924	0.768081 5
SellerGAsset	59083.9325	306275.32 8	0.1929112	0.847032 0
SellerGAssisi	- 465850.626 5	334941.16 8	- 1.3908431	0.164300 3

SellerGAustralian	-	410262.99	-	0.849052
	78085.9341	6	0.1903314	8
SellerGAvion	459281.563	410232.51	1.1195640	0.262923
	1	5		3
SellerGBarlow	206311.485	251835.31	0.8192317	0.412671
	6	5		4
SellerGBarry	-	236978.47	-	0.906321
	27888.2015	5	0.1176824	4
SellerGBayside	-	273779.92	-	0.763165
	82499.2079	9	0.3013340	3
SellerGBekdon	134100.666	259493.71	0.5167781	0.605321
	7	4		1
SellerGBell	67679.9169	423900.13	0.1596601	0.873151
		1		7
SellerGBeller	-	262046.74	-	0.420249
	211214.398	3	0.8060180	3
	2			
SellerGBells	-	243087.30	-	0.795606
	62970.2302	5	0.2590437	2
SellerGBenlor	7360.9041	281059.97	0.0261898	0.979106
		7		4
SellerGBiggin	20660.7672	237981.11	0.0868168	0.930818
		1		6
SellerGBlack	278827.052	410698.82	0.6789088	0.497209
	1	4		5
SellerGBoutique	-	335541.91	-	0.866758
	56297.6779	3	0.1677814	3
SellerGBowman	-	274893.72	-	0.632775
	131354.454	6	0.4778372	3
	1			
SellerGBrace	97962.0192	305782.90	0.3203646	0.748697
		7		9
SellerGBrad	-	237962.18	-	0.961576
	11464.3091	1	0.0481770	0
SellerGBranon	-142.1415	335122.65	-	0.999661
		0	0.0004241	6
SellerGBuckingham	85289.4847	241301.81	0.3534556	0.723753
		8		5
SellerGBullen	-	335268.47	-	0.931288
	28908.6390	9	0.0862253	8

SellerGBurnham	32491.5994	248949.14	0.1305150	0.896161
		1		3
SellerGBurns	-	335521.88	-	0.452307
	252178.149	8	0.7515997	4
	7			
SellerGBustin	-	410262.99	-	0.676675
	171085.934	6	0.4170153	1
	1			
SellerGBuxton	40041.4408	237475.66	0.1686128	0.866104
		2		2
SellerGBuxton/Advantage	-	410510.06	-	0.668714
	175667.414	9	0.4279247	0
	5			
SellerGBuxton/Buxton	18472.5650	335101.35	0.0551253	0.956039
		7		6
SellerGBuxton/Marshall	277316.634	410492.97	0.6755697	0.499327
	3	5		6
SellerGBuxton/O'Brien	184364.929	410331.98	0.4493067	0.653219
	2	3		0
SellerGbuyMyplace	158165.154	273599.24	0.5780906	0.563214
	1	2		4
SellerGC	-	411363.28	-	0.776547
	116756.341	8	0.2838278	5
	3			
SellerGC21	-	240689.14	-	0.691056
	95657.4225	1	0.3974314	8
SellerGCaine	-	280401.21	-	0.624291
	137338.116	9	0.4897914	0
	4			
SellerGCalder	42194.4217	280640.45	0.1503505	0.880490
		8		8
SellerGCarter	36814.4934	246805.00	0.1491643	0.881426
		8		6
SellerGCastran	54233.6570	280493.04	0.1933512	0.846687
		5		4
SellerGCASTRAN	-	410156.42	-	0.279184
	443872.892	4	1.0822039	9
	3			
SellerGCayzer	72092.7038	244072.01	0.2953747	0.767713
		4		0

SellerGCentury	- 280649.78	- 0.654197
	125717.135 0	0.4479502 7
	4	
SellerGChambers	9424.9811 290232.98	0.0324738 0.974094
	9	7
SellerGChanging	- 335231.39	- 0.382739
	292621.267 9	0.8728934 7
	6	
SellerGCharlton	- 265335.39	- 0.920241
	26568.3672 8	0.1001313 9
SellerGChisholm	72570.5023 241946.15	0.2999448 0.764224
	4	7
SellerGChristopher	- 280421.48	- 0.466090
	204393.299 9	0.7288789 8
	7	
SellerGClairmont	86916.4221 410588.55	0.2116874 0.832354
	4	7
SellerGCocoon	- 410561.74	- 0.810510
	98441.6271 3	0.2397730 6
SellerGCollings	48362.9477 290100.97	0.1667107 0.867600
	4	6
SellerGCollins	278414.455 244000.61	1.1410400 0.253877
	0 4	4
SellerGCommercial	143301.584 410484.98	0.3491031 0.727018
	1 9	4
SellerGCommunity	- 415513.32	- 0.543151
	252662.030 5	0.6080720 9
	0	
SellerGCompton	263914.169 281096.46	0.9388740 0.347815
	1 7	4
SellerGConsidine	- 245946.18	- 0.861639
	42866.4031 7	0.1742918 3
SellerGCoventry	- 306377.74	- 0.855605
	55752.9861 0	0.1819747 9
SellerGCrane	-7181.9579 306808.73	- 0.981324
	2	0.0234086 8
SellerGCreate	- 410138.49	- 0.813268
	96881.9538 5	0.2362177 0
SellerGD'Aprano	- 306002.19	- 0.763818
	91946.7075 3	0.3004773 6

SellerGDaniel	-	273827.86	-	0.753303
	86062.5266	5	0.3142943	3
SellerGDarras	-	290439.36	-	0.780968
	80760.5139	8	0.2780632	9
SellerGDarren	127779.878	240742.24	0.5307746	0.595585
	1	6		3
SellerGDel	-	254181.07	-	0.770731
	74074.7434	6	0.2914251	6
SellerGDingle	-	250660.29	-	0.452893
	188152.222	5	0.7506263	1
	2			
SellerGDirect	-	410454.32	-	0.547479
	246912.508	1	0.6015590	7
	1			
SellerGDixon	10290.4994	305926.07	0.0336372	0.973167
		2		0
SellerGDomain	-	305993.60	-	0.554634
	180795.381	2	0.5908469	8
	1			
SellerGDonovan	-	411191.13	-	0.283736
	440802.756	1	1.0720143	4
	1			
SellerGDouglas	-	240818.52	-	0.941179
	17769.9173	0	0.0737897	1
SellerGEdward	-	250227.11	-	0.591627
	134245.279	5	0.5364937	9
	8			
SellerGElite	292413.722	410364.46	0.7125708	0.476126
	7	8		1
SellerGENrich	-	409875.19	-	0.383556
	357163.516	5	0.8713958	5
	2			
SellerGEric	-	336677.35	-	0.894336
	44717.9960	0	0.1328215	9
SellerGView	49535.3280	243092.06	0.2037719	0.838535
		7		4
SellerGFinders	521113.886	410457.21	1.2695937	0.204255
	4	7		4
SellerGFirst	510934.709	410799.56	1.2437567	0.213614
	7	0		8

SellerGFlannagan	201688.499 7	273645.53 9	0.7370429	0.461111 5
SellerGFletchers	17481.4798	237784.98 0	0.0735180	0.941395 2
SellerGFletchers/Fletchers	- 133347.683 0	268704.92 5	- 0.4962607	0.619720 1
SellerGFletchers/One	80099.7877	410146.76 1	0.1952954	0.845165 2
SellerGFN	- 30751.9391	247264.02 9	- 0.1243688	0.901025 5
SellerGFrank	103513.671 8	250048.33 7	0.4139746	0.678900 5
SellerGFree	44476.9112	335635.28 0	0.1325156	0.894578 8
SellerGGalldon	269956.149 9	410262.79 4	0.6580079	0.510546 4
SellerGGardiner	- 189497.423 2	290770.65 9	- 0.6517075	0.514603 1
SellerGGarvey	90152.4681	305934.91 2	0.2946786	0.768244 8
SellerGGary	25159.6311	239004.28 0	0.1052685	0.916164 6
SellerGGL	- 35596.2396	268900.73 6	- 0.1323769	0.894688 6
SellerGGrant's	- 183641.019 0	415276.18 0	- 0.4422142	0.658342 6
SellerGGreg	79427.6049	238775.28 3	0.3326458	0.739407 8
SellerGgunn&Co	53722.1561	335104.68 3	0.1603145	0.872636 2
SellerGH	300911.002 9	409860.01 0	0.7341800	0.462854 2
SellerGHall	- 258534.216 1	269503.84 4	- 0.9592970	0.337429 6
SellerGHam	- 219846.046 5	290365.36 3	- 0.7571359	0.448984 2



SellerGHamilton	-	334861.79	-	0.805801
	82326.5167	8	0.2458522	1
SellerGHAR	-3366.1728	238801.48	-	0.988753
		8	0.0140961	5
SellerGHarcourts	-	237993.88	-	0.842411
	47316.6057	8	0.1988144	5
SellerGHarrington	-6218.8735	259612.23	-	0.980889
		5	0.0239545	3
SellerGHaughton	-	256313.58	-	0.425955
	204066.716	0	0.7961604	5
	0			
SellerGhockingstuart	-	237187.61	-	0.947602
	15587.6621	5	0.0657187	9
SellerGhockingstuart/ASL	438337.711	410119.12	1.0688058	0.285179
	4	4		9
SellerGhockingstuart/Barry	-	410138.49	-	0.895481
	53881.9538	5	0.1313750	0
SellerGhockingstuart/Buxton	22024.9544	410389.66	0.0536684	0.957200
		9		3
SellerGhockingstuart/hockingstuart	-	253718.31	-	0.880941
	38001.6214	9	0.1497788	8
SellerGhockingstuart/Jellis	-	410257.18	-	0.647634
	187513.624	2	0.4570636	1
	1			
SellerGHodges	-8439.1057	238434.47	-	0.971766
		0	0.0353938	3
SellerGHolland	156293.496	305795.18	0.5111052	0.609287
	2	8		4
SellerGHome	467281.246	335610.82	1.3923307	0.163849
	4	7		6
SellerGHomes	-	305973.49	-	0.668487
	131029.021	5	0.4282365	1
	5			
SellerGHooper	-	410151.01	-	0.642358
	190480.740	0	0.4644161	6
	5			
SellerGHoskins	235722.529	280791.74	0.8394924	0.401210
	1	8		8
SellerGHunter	-	306772.84	-	0.790162
	81634.2004	3	0.2661063	1

SellerGIconek	-	245437.31	-	0.892246
	33248.2309	9	0.1354653	4
SellerGiHomes	-	334808.67	-	0.794811
	87074.9032	9	0.2600736	7
SellerGInner	120559.633	410516.84	0.2936777	0.769009
	5	2		6
SellerGIntegrity	537580.575	424033.92	1.2677773	0.204903
	5	7		5
SellerGiSell	30151.6774	248106.47	0.1215272	0.903275
		7		6
SellerGiTRAK	-	248986.30	-	0.799174
	63347.4823	5	0.2544216	5
SellerGJ	-	268951.76	-	0.779451
	75317.3734	9	0.2800404	6
SellerGJas	49274.6086	239321.45	0.2058930	0.836878
		9		2
SellerGJason	-	243936.41	-	0.894891
	32228.8473	2	0.1321199	8
SellerGJellis	104324.589	237102.09	0.4399986	0.659946
	6	0		5
SellerGJMRE	-	410413.01	-	0.640069
	191914.725	5	0.4676136	9
	0			
SellerGJoe	-	410468.80	-	0.935291
	33326.2970	4	0.0811908	6
SellerGJohnston	-	410436.85	-	0.170820
	562158.119	2	1.3696580	8
	4			
SellerGJoseph	-	410119.12	-	0.207772
	516662.288	4	1.2597859	5
	6			
SellerGJRW	-	334740.88	-	0.719368
	120276.407	5	0.3593120	4
	1			
SellerGJudith	93713.2617	410009.14	0.2285638	0.819212
		5		1
SellerGJust	197268.002	338089.55	0.5834786	0.559582
	3	2		8
SellerGJustin	-	410715.99	-	0.428753
	325021.989	7	0.7913546	6
	5			

SellerGK.R.Peters	118631.036 1	306357.12 6	0.3872312	0.698592 3
SellerGKaren	- 421662.288 6	410119.12 4	- 1.0281459	0.303903 1
SellerGKay	504397.581 5	240602.20 1	2.0963964	0.036069 1
SellerGKaye	29342.9112	337496.97 6	0.0869427	0.930718 6
SellerGKeatings	72960.3499	311668.96 6	0.2340957	0.814914 9
SellerGKelly	653850.816 7	280496.58 4	2.3310473	0.019768 3
SellerGKen	- 49979.4008	410235.69 2	- 0.1218309	0.903035 1
SellerGL	159825.952 2	336267.51 8	0.4752941	0.634586 5
SellerGLandfield	- 59870.7058	409876.73 2	- 0.1460700	0.883868 7
SellerGLangwell	- 251083.155 3	335019.09 8	- 0.7494592	0.453596 0
SellerGLE	- 32562.4028	281569.69 1	- 0.1156460	0.907935 2
SellerGLearning	71842.5043	291407.78 2	0.2465360	0.805271 8
SellerGLEeburn	259357.319 2	263766.96 7	0.9832820	0.325489 6
SellerGLeyton	- 25967.5050	275612.58 3	- 0.0942174	0.924938 1
SellerGLindellas	1586.1551	248714.81 4	0.0063774	0.994911 7
SellerGLITTLE	- 141062.885 2	247433.70 1	- 0.5701038	0.568618 6
SellerGLJ	- 65560.6542	241511.56 0	- 0.2714597	0.786042 4
SellerGLJH	- 108259.212 2	280287.44 1	- 0.3862435	0.699323 6

SellerGLLC	-	290397.57	-	0.951248
	17755.1973	1	0.0611410	0
SellerGLove	-	239128.10	-	0.940475
	17856.6138	8	0.0746738	5
SellerGLuxe	-	410263.01	-	0.304250
	421507.602	8	1.0274082	2
	1			
SellerGM.J	-	273983.57	-	0.942843
	19644.2216	5	0.0716985	1
SellerGMaddison	-	410302.67	-	0.893400
	54982.6358	2	0.1340051	9
SellerGMaitland	-	335229.50	-	0.606881
	172490.614	7	0.5145448	1
	7			
SellerGMandy	121624.011	410237.42	0.2964722	0.766874
	9	7		9
SellerGMarshall	376144.263	237654.52	1.5827356	0.113509
	9	2		6
SellerGMarvelli	74133.6222	410530.35	0.1805801	0.856700
		0		4
SellerGMason	-	263258.27	-	0.789294
	70351.1902	8	0.2672326	9
SellerGMatthew	-	290458.66	-	0.931655
	24910.7888	4	0.0857636	8
SellerGMax	-	259795.86	-	0.764111
	77962.9653	5	0.3000932	6
SellerGMcDonald	170576.676	245473.50	0.6948883	0.487139
	5	5		5
SellerGMcEwing	400405.079	411201.30	0.9737447	0.330204
	2	4		1
SellerGMcGrath	31008.6565	238023.97	0.1302753	0.896350
		6		9
SellerGMcGrath/First	-	410286.46	-	0.555074
	242147.339	6	0.5901909	4
	0			
SellerGMcGrath/Langwell	-	306461.03	-	0.753094
	96403.2156	4	0.3145692	5
SellerGMcLennan	-	261752.73	-	0.656039
	116584.477	0	0.4453993	7
	5			

SellerGMcNaughton	- 410481.68	- 0.876825
	63623.8967 8	0.1549981 5
SellerGMeadows	122332.585 410510.06	0.2980014 0.765707
	5 9	5
SellerGMega	287234.344 410381.89	0.6999196 0.483991
	8 1	8
SellerGMelbourne	135758.369 257358.46	0.5275069 0.597851
	2 6	9
SellerGMICM	- 248836.54	- 0.517892
	160901.961 5	0.6466171 9
	4	
SellerGMiles	130809.712 239278.53	0.5466839 0.584606
	9 8	7
SellerGMillership	- 249473.34	- 0.774508
	71471.4398 3	0.2864893 6
SellerGMitchell	114467.462 335405.50	0.3412808 0.732898
	7 0	5
SellerGMJ	313694.612 410482.09	0.7642102 0.444757
	2 9	9
SellerGMoonee	- 245769.44	- 0.392562
	210136.014 5	0.8550128 1
	8	
SellerGMorleys	- 335509.53	- 0.646616
	153824.604 1	0.4584806 0
	5	
SellerGMorrison	65840.8336 241331.34	0.2728234 0.784994
	7	0
SellerGMunn	- 307330.97	- 0.389966
	264215.823 7	0.8597110 5
	9	
SellerGNardella	- 335035.16	- 0.448241
	254082.593 4	0.7583759 7
	8	
SellerGNelson	30249.4254 237190.91	0.1275320 0.898521
	9	6
SellerGNexus	- 410282.89	- 0.884700
	59497.7919 5	0.1450165 4
SellerGNguyen	11056.2731 280730.92	0.0393839 0.968585
	2	0
SellerGNicholas	800405.079 411201.30	1.9465042 0.051618
	2 4	8

SellerGNicholls	-	412827.60	-	0.744857
	134349.049	1	0.3254362	0
	0			
SellerGNicholson	-	305780.71	-	0.501203
	205673.757	3	0.6726185	7
	0			
SellerGNick	350369.517	249490.80	1.4043384	0.160245
	0	9		5
SellerGNoel	35219.2803	238204.42	0.1478532	0.882461
		8		3
SellerGO'Brien	-	239372.68	-	0.695504
	93691.9566	0	0.3914062	3
SellerGO'Donoghues	-	335224.53	-	0.723477
	118610.364	8	0.3538236	6
	6			
SellerGObrien	43707.9394	265058.06	0.1648995	0.869026
		1		0
SellerGOBrien	22981.0181	256012.50	0.0897652	0.928475
		8		4
SellerGOne	170150.477	281362.58	0.6047374	0.545365
	8	9		6
SellerGP	-	410511.63	-	0.812734
	97252.6688	0	0.2369060	0
SellerGPagan	7077.4559	253431.67	0.0279265	0.977721
		7		3
SellerGParkes	145066.148	259339.65	0.5593674	0.575922
	8	0		0
SellerGPaul	-	274038.34	-	0.785634
	74535.8785	6	0.2719907	1
SellerGPeake	143943.291	297563.21	0.4837402	0.628579
	3	7		6
SellerGPeninsula	-	410476.35	-	0.718164
	148149.694	9	0.3609214	9
	7			
SellerGPeople	253794.845	306033.68	0.8293036	0.406950
	9	5		1
SellerGPeter	-	249048.59	-	0.673902
	104802.027	4	0.4208096	1
	0			
SellerGPhilip	-	240764.84	-	0.894439
	31947.4079	9	0.1326913	9

SellerGPoint	-	262796.57	-	0.938331
	20332.1850	0	0.0773685	7
SellerGPRDNationwide	-3368.0059	255336.51	-	0.989476
		7	0.0131905	1
SellerGPride	48370.1507	273919.54	0.1765852	0.859837
		9		3
SellerGProf	-	409868.38	-	0.400639
	344499.230	2	0.8405118	2
	6			
SellerGProf.	-	243470.14	-	0.930888
	21115.8091	2	0.0867285	8
SellerGProfessionals	-	259354.98	-	0.815025
	60676.8290	9	0.2339528	8
SellerGProperty	68481.3181	306114.23	0.2237116	0.822985
		9		7
SellerGPurplebricks	-	243537.42	-	0.814549
	57125.6917	1	0.2345664	5
SellerGR&H	-	306183.06	-	0.526399
	193976.363	2	0.6335307	9
	4			
SellerGRaine	-	238885.19	-	0.884497
	34703.5764	7	0.1452730	9
SellerGRaine&Horne	-	335833.41	-	0.544061
	203750.326	7	0.6067006	8
	7			
SellerGRay	-	237097.84	-	0.791747
	62605.1718	5	0.2640478	9
SellerGRe	-	268543.73	-	0.546577
	161908.951	7	0.6029146	5
	6			
SellerGRE	66573.7607	264759.06	0.2514504	0.801470
		4		5
SellerGReal	292058.820	290141.52	1.0066081	0.314144
	5	7		6
SellerGRealty	772824.653	410416.96	1.8830232	0.059722
	1	7		8
SellerGRed	-	409859.06	-	0.918364
	42009.0408	0	0.1024963	6
SellerGRedina	-	410570.72	-	0.850227
	77529.3250	7	0.1888331	0

SellerGReliance	-	256508.37	-	0.896518
	33362.4480	1	0.1300638	3
SellerGREMAX	-	338362.96	-	0.886734
	48196.7641	4	0.1424410	2
SellerGRendina	35345.6912	243663.47	0.1450595	0.884666
		5		5
SellerGRexhepi	72348.9761	412872.01	0.1752334	0.860899
		2		3
SellerGRistic	13531.7441	334788.36	0.0404188	0.967760
		2		0
SellerGRodney	-	280592.70	-	0.377677
	247544.143	6	0.8822187	2
	4			
SellerGRoger	-	335275.06	-	0.276384
	364956.497	8	1.0885286	9
	1			
SellerGRosin	-	410416.81	-	0.528944
	258414.079	7	0.6296381	0
	3			
SellerGRoss	-	335231.55	-	0.196759
	432755.843	3	1.2909162	0
	0			
SellerGRounds	-	410510.06	-	0.329073
	400667.414	9	0.9760234	7
	5			
SellerGRT	133040.444	239232.64	0.5561133	0.578144
	3	5		4
SellerGRW	-	238974.65	-	0.856974
	43070.5015	7	0.1802304	9
SellerGRyder	58199.8443	307979.61	0.1889730	0.850117
		2		3
SellerGS&L	137296.831	253427.24	0.5417604	0.587994
	3	2		2
SellerGSanctuary	-	410511.98	-	0.799673
	104178.149	8	0.2537761	1
	7			
SellerGSchroeder	-	251322.38	-	0.841019
	50413.9283	4	0.2005947	1
SellerGScott	67560.0808	290228.98	0.2327820	0.815934
		0		9



SellerGSell	- 289942.43 - 0.224792	351975.404 3 1.2139493 4	9
SellerGShape	- 306399.55 - 0.342318	290967.406 9 0.9496339 5	7
SellerGShine	- 410282.89 - 0.414925	334497.791 5 0.8152857 9	9
SellerGSkad	7373.8393 268668.66 0.0274458 0.978104	7 6	
SellerGSmart	- 334929.15 - 0.305750	343043.399 2 1.0242268 0	3
SellerGSotheby's	127693.221 305881.55 0.4174597 0.676350	6 7 1	
SellerGSpace	- 410152.13 - 0.902403	50296.4240 2 0.1226287 3	
SellerGSpencer	- 410044.43 - 0.801818	102921.318 0 0.2510004 3	2
SellerGSteller	- 335234.65 - 0.923751	32085.6113 9 0.0957109 9	
SellerGStockdale	- 238381.03 - 0.751127	75605.2663 5 0.3171614 0	
SellerGSurreal	165566.809 335781.35 0.4930792 0.621966	2 1 1	
SellerGSweeney	36817.6464 238963.06 0.1540725 0.877555	2 3	
SellerGSweeney/Advantage	- 335476.78 - 0.824605	74351.8560 5 0.2216304 6	
SellerGThe	207431.364 268520.06 0.7724986 0.439835	8 0 3	
SellerGThomas	- 268704.79 - 0.873322	42843.0508 3 0.1594428 8	
SellerGThomson	- 243080.69 - 0.609929	124016.765 3 0.5101876 9	3
SellerGTim	-5434.2511 259687.36 - 0.983305	0 0.0209261 0	

SellerGTrimson	94401.5052	265181.28	0.3559886	0.721855
		2		7
SellerGTriwest	39869.4121	256789.42	0.1552611	0.876618
		7		2
SellerGTRUE	-	411805.08	-	0.798340
	105216.934	7	0.2555018	2
	6			
SellerGU	-	281504.90	-	0.812910
	66626.3475	0	0.2366792	0
SellerGUFIRST	-	411151.78	-	0.684352
	167150.465	6	0.4065420	1
	2			
SellerGUnited	-	410481.68	-	0.954106
	23623.8967	8	0.0575516	8
SellerGUpSide	141424.378	335021.03	0.4221358	0.672933
	2	3		9
SellerGVeitch	-	411190.34	-	0.674484
	172704.718	1	0.4200116	9
	2			
SellerGVICPROP	23755.0724	334696.05	0.0709751	0.943418
		6		9
SellerGVillage	111478.207	241616.64	0.4613846	0.644531
	6	4		5
SellerGvoglwalpole	-	410588.44	-	0.758166
	126418.990	6	0.3078971	3
	2			
SellerGW.B.	-	280655.85	-	0.405231
	233602.802	6	0.8323461	1
	2			
SellerGWalsh	224987.433	335018.70	0.6715668	0.501873
	4	0		2
SellerGWalshe	-	249057.98	-	0.696876
	97020.6798	8	0.3895506	2
SellerGWeast	466065.021	335019.92	1.3911561	0.164205
	5	7		4
SellerGWeda	110571.617	410305.56	0.2694860	0.787560
	2	8		6
SellerGWeston	270233.163	410201.82	0.6587810	0.510049
	5	4		8
SellerGWestside	18637.6452	305973.49	0.0609126	0.951429
		5		9

SellerGWhiting	30628.3428	262286.22	0.1167745	0.907040
		2		8
SellerGWilliam	-	265469.38	-	0.787536
	71548.5724	0	0.2695172	6
SellerGWilliams	123616.730	242168.90	0.5104567	0.609741
	3	1		5
SellerGWilson	-	254981.67	-	0.801712
	64035.3133	4	0.2511369	8
SellerGWin	-	252697.37	-	0.517262
	163644.529	8	0.6475909	7
	5			
SellerGWoodards	-	237998.39	-	0.917859
	24545.2928	5	0.1031322	9
SellerGWoodards/hockingstuart	-	410235.75	-	0.558013
	240321.089	6	0.5858121	4
	4			
SellerGWyndham	73301.5841	410484.98	0.1785731	0.858276
		9		1
SellerGYPA	-	238003.31	-	0.812572
	56434.0192	4	0.2371144	3
SellerGZed	-	410161.61	-	0.472667
	294565.624	7	0.7181696	5
	6			
CouncilAreaBayside City Council	673070.473	31865.048	21.122531	0.000000
	9		3	0
CouncilAreaBoroondara City Council	592229.700	29882.211	19.818804	0.000000
	8		4	0
CouncilAreaBrimbank City Council	-	41183.905	-	0.000561
	142103.899		3.4504717	6
	0			
CouncilAreaCardinia Shire Council	416856.405	116745.86	3.5706309	0.000357
	7	9		6
CouncilAreaCasey City Council	309035.543	61360.884	5.0363606	0.000000
	5			5
CouncilAreaDarebin City Council	162991.940	23732.754	6.8678056	0.000000
	2			0
CouncilAreaFrankston City Council	512589.883	52540.845	9.7560266	0.000000
	5			0
CouncilAreaGlen Eira City Council	417183.906	31365.705	13.300638	0.000000
	9		7	0

CouncilAreaGreater Dandenong City Council	208951.3426	48581.749	4.3010255	0.0000171
CouncilAreaHobsons Bay City Council	49980.8159	48119.781	1.0386750	0.2989780
CouncilAreaHume City Council	-53732.1224	26890.842	-1.9981569	0.0457235
CouncilAreaKingston City Council	441027.4514	37241.868	11.8422485	0.0000000
CouncilAreaKnox City Council	95975.0746	33509.525	2.8641133	0.0041895
CouncilAreaMacedon Ranges Shire Council	434907.6932	100229.434	4.3391215	0.0000144
CouncilAreaManningham City Council	197345.3606	25912.709	7.6157751	0.0000000
CouncilAreaMaribyrnong City Council	-28842.4840	46151.687	-0.6249497	0.5320166
CouncilAreaMaroondah City Council	125591.6700	32837.457	3.8246466	0.0001317
CouncilAreaMelbourne City Council	329645.4989	28716.608	11.4792631	0.0000000
CouncilAreaMelton City Council	-152374.1715	53326.259	-2.8573947	0.0042791
CouncilAreaMitchell Shire Council	157075.6149	129464.767	1.2132692	0.2250522
CouncilAreaMonash City Council	352556.6391	25557.303	13.7947513	0.0000000
CouncilAreaMoonee Valley City Council	194089.4576	43039.172	4.5096002	0.0000066
CouncilAreaMoorabool Shire Council	179960.4899	249862.344	0.7202385	0.4713930
CouncilAreaMoreland City Council	106468.5772	25820.598	4.1233971	0.0000376
CouncilAreaNillumbik Shire Council	-102829.9825	85805.617	-1.1984062	0.2307840
CouncilAreaPort Phillip City Council	386165.4002	35037.195	11.0215842	0.0000000
CouncilAreaStonnington City Council	590986.9620	34368.300	17.1956994	0.0000000

CouncilAreaWhitehorse City Council	197038.7167	28603.360	6.8886564	0.0000000
CouncilAreaWhittlesea City Council	-2197.0535	27840.885	-0.0789146	0.9371019
CouncilAreaWyndham City Council	-185338.4373	44838.946	-4.1334254	0.0000360
CouncilAreaYarra City Council	306350.3947	31459.585	9.7379032	0.0000000
CouncilAreaYarra Ranges Shire Council	196143.4937	85917.235	2.2829353	0.0224526

## Test data performance metric test

```
# Compute R^2 from true and predicted values
eval_results <- function(true, predicted, df) {
  SSE <- sum((predicted - true)^2)
  SST <- sum((true - mean(true))^2)
  R_square <- 1 - SSE / SST
  RMSE = sqrt(SSE/nrow(df))

  # Model performance metrics
  data.frame(
    RMSE = RMSE,
    Rsquare = R_square
  )
}

# Prediction and evaluation on train data
predictions_test <- predict(Ful.Model1)
eval_results(test$Price, predictions_test, test)

##      RMSE    Rsquare
## 1 329613 0.6343633
```

## Normalizing data

```
library(caret)

## Loading required package: lattice

##
## Attaching package: 'caret'

## The following object is masked from 'package:survival':
##
##      cluster

preproc1<-preProcess(Project,method=c("center","scale"))
Project1<-predict(preproc1,Project)
```

## Splitting normalized dataset

```
sample1 = sample.split(Project1$Price, SplitRatio = .75)
training1 = subset(Project1, sample1 == TRUE)
test1 = subset(Project1, sample1 == FALSE)

training1<-na.omit(training1)
Ful.Mod<-lm(Price~Distance+Type+Rooms+Regionname+SellerG+CouncilArea,data=training1)
Mode<-summary(Ful.Mod)
kable(Mode$coefficients,caption="Table11: Multiple Regression Coefficients")
```

Table11: Multiple Regression Coefficients

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	-0.1496725	0.1563166	-1.0443908	0.2963116
Distance	-0.0102588	0.3541039	-34.5169305	0.0000000
Typet	-0.0117389	0.3956723	-33.7060135	0.0000000
Typeu	-0.0107906	0.7129607	-66.0724334	0.0000000
Rooms	0.0042223	0.3823874	90.5637281	0.0000000
RegionnameEastern Victoria	-0.0727312	0.1455448	-2.0011325	0.0453855
RegionnameNorthern Metropolitan	-0.0252731	0.2970355	-11.7530169	0.0000000
RegionnameNorthern Victoria	0.0825729	0.0561495	0.6799998	0.4965090
RegionnameSouth-Eastern Metropolitan	-0.0322266	0.1948175	-6.0452359	0.0000000
RegionnameSouthern Metropolitan	-0.0258078	0.2353497	-9.1193101	0.0000000

RegionnameWestern Metropolitan	- 0.243355 9	0.0442402	-5.5007860	0.0000000
RegionnameWestern Victoria	0.099026 7	0.0870678	1.1373514	0.2553989
SellerGA	- 0.005680 9	0.4003270	-0.0141906	0.9886780
SellerGAbercromby's	1.396893 0	0.1862351	7.5006975	0.0000000
SellerGAbley	- 0.175650 3	0.6615659	-0.2655069	0.7906205
SellerGAce	0.371856 5	0.3546828	1.0484198	0.2944522
SellerGAIME	- 0.286275 9	0.6613240	-0.4328830	0.6651023
SellerGAlex	0.293836 7	0.4044666	0.7264795	0.4675495
SellerGAlexkarbon	0.092540 1	0.1653353	0.5597116	0.5756796
SellerGAllan	- 0.244227 1	0.6611646	-0.3693892	0.7118398
SellerGAllens	- 0.042292 9	0.2007504	-0.2106738	0.8331430
SellerGAnderson	0.000454 2	0.3244713	0.0013997	0.9988832
SellerGAppleby	- 0.171617 4	0.3028067	-0.5667555	0.5708838
SellerGAquire	0.187731 6	0.2041347	0.9196457	0.3577641
SellerGARbee	0.025208 4	0.4360101	0.0578162	0.9538954
SellerGArea	0.106831 2	0.1821427	0.5865246	0.5575267
SellerGAscend	0.579844 8	0.2852012	2.0331082	0.0420489

SellerGAsh	- 0.366635 0	0.3256943	-1.1257031	0.2602987
SellerGASL	0.120332 4	0.2610296	0.4609915	0.6448075
SellerGAsset	0.132245 7	0.2103673	0.6286419	0.5295875
SellerGAssisi	0.434512 3	0.3546333	1.2252437	0.2204914
SellerGAumeca	- 0.087132 8	0.6613276	-0.1317543	0.8951794
SellerGAusin	0.130884 4	0.6611059	0.1979780	0.8430634
SellerGAustralian	- 0.023685 3	0.6611917	-0.0358222	0.9714243
SellerGAuv	- 0.088212 8	0.6612570	-0.1334017	0.8938765
SellerGAvion	0.866690 9	0.6611730	1.3108383	0.1899207
SellerGBarlow	0.389055 3	0.1740420	2.2354102	0.0253965
SellerGBarry	0.062807 7	0.1484424	0.4231114	0.6722165
SellerGBatty	0.150694 8	0.6614010	0.2278417	0.8197706
SellerGBayside	- 0.163735 1	0.2158275	-0.7586390	0.4480735
SellerGBekdon	0.259260 7	0.2043852	1.2684903	0.2046311
SellerGBell	0.376831 8	0.6705594	0.5619662	0.5741425
SellerGBeller	- 0.246196 5	0.1896471	-1.2981822	0.1942330
SellerGBells	0.033518 4	0.1609331	0.2082755	0.8350151



SellerGBelmar	0.182670 5	0.6618597	0.2759958	0.7825529
SellerGBenchmark	- 0.388466 3	0.4797437	-0.8097370	0.4180967
SellerGBenlor	0.281975 5	0.2856715	0.9870619	0.3236189
SellerGBesser	- 0.266000 2	0.6611877	-0.4023066	0.6874608
SellerGBetter	- 0.200602 2	0.6611917	-0.3033950	0.7615906
SellerGBiggin	0.115336 4	0.1503234	0.7672550	0.4429349
SellerGBlackbird	0.531784 7	0.4802964	1.1072012	0.2682143
SellerGBombay	0.351224 6	0.4005026	0.8769596	0.3805144
SellerGBoran	- 0.177832 7	0.4004353	-0.4440984	0.6569741
SellerGBoutique	- 0.090946 3	0.2456946	-0.3701600	0.7112654
SellerGBowman	- 0.049749 2	0.2172963	-0.2289463	0.8189120
SellerGBrace	- 0.054709 9	0.2611360	-0.2095074	0.8340533
SellerGBrad	0.101756 7	0.1502893	0.6770723	0.4983644
SellerGBranon	- 0.016127 5	0.2523416	-0.0639113	0.9490412
SellerGBuckingham	0.190048 4	0.1561815	1.2168430	0.2236719
SellerGBullen	- 0.592519 3	0.4791753	-1.2365398	0.2162660

SellerGBurnham	0.111513 3	0.1681528	0.6631667	0.5072280
SellerGBurns	- 0.349063 3	0.4794536	-0.7280439	0.4665914
SellerGBuxton	0.164248 1	0.1492673	1.1003619	0.2711818
SellerGBuxton/Advantage	- 0.208590 6	0.6613504	-0.3154010	0.7524590
SellerGBuxton/Buxton	0.039446 9	0.6612112	0.0596586	0.9524279
SellerGBuxton/Find	0.261444 5	0.6618986	0.3949918	0.6928513
SellerGBuxton/Hodges	0.520520 2	0.6611746	0.7872659	0.4311314
SellerGBuxton/Marshall	1.777865 4	0.4791452	3.7104936	0.0002072
SellerGBuxton/O'Brien	0.425028 2	0.6612136	0.6428002	0.5203578
SellerGbuyMyplace	0.349448 6	0.2519782	1.3868209	0.1655049
SellerGC	- 0.074534 2	0.6619197	-0.1126031	0.9103459
SellerGC21	- 0.046406 1	0.1549759	-0.2994407	0.7646055
SellerGCaine	1.507968 3	0.1938547	7.7788603	0.0000000
SellerGCalder	0.016850 9	0.2447515	0.0688492	0.9451100
SellerGCarlinSmith	0.188800 2	0.6612694	0.2855118	0.7752537
SellerGCarter	0.115363 5	0.1725039	0.6687584	0.5036539
SellerGCastran	1.273858 7	0.2047973	6.2200937	0.0000000
SellerGCayzer	0.480667 0	0.1665873	2.8853769	0.0039118

SellerGCentury	- 0.148751 5	0.1966500	-0.7564276	0.4493978
SellerGChambers	0.316935 3	0.2044611	1.5501008	0.1211260
SellerGChanging	- 0.782669 8	0.6615936	-1.1830069	0.2368142
SellerGCharlton	0.091950 5	0.1804620	0.5095281	0.6103852
SellerGCharter	- 0.008410 3	0.4790493	-0.0175562	0.9859930
SellerGChisholm	0.384913 8	0.1596399	2.4111383	0.0159078
SellerGChristopher	- 0.249402 3	0.2521062	-0.9892748	0.3225353
SellerGClairmont	0.251920 2	0.6613936	0.3808930	0.7032849
SellerGCoad	- 0.236812 8	0.6613431	-0.3580786	0.7202866
SellerGCocoon	- 0.001749 4	0.6613788	-0.0026451	0.9978895
SellerGCollin	0.109749 7	0.6611070	0.1660090	0.8681508
SellerGCollings	0.124669 6	0.2519864	0.4947471	0.6207816
SellerGCollins	0.533327 1	0.1618712	3.2947627	0.0009860
SellerGCommercial	0.343813 1	0.6612694	0.5199290	0.6031163
SellerGCommunity	0.133496 8	0.2465348	0.5414927	0.5881714
SellerGCompton	0.234501 8	0.2162783	1.0842596	0.2782569
SellerGConley	0.040714 0	0.6612958	0.0615669	0.9509080

SellerGConquest	0.398552 3	0.6613870	0.6026008	0.5467781
SellerGConsidine	- 0.106449 1	0.1681620	-0.6330152	0.5267277
SellerGCoventry	- 0.105612 3	0.3550136	-0.2974879	0.7660957
SellerGCraig	0.022582 4	0.4792009	0.0471250	0.9624138
SellerGCrane	0.088513 9	0.3019829	0.2931090	0.7694405
SellerGCreate	- 0.061491 6	0.3548675	-0.1732805	0.8624319
SellerGD'Aprano	- 0.127394 1	0.2613140	-0.4875137	0.6258973
SellerGDaniel	0.103151 1	0.2232535	0.4620359	0.6440583
SellerGDarras	0.679858 2	0.2857563	2.3791541	0.0173576
SellerGDarren	0.293673 4	0.1560135	1.8823596	0.0597952
SellerGDavid	- 0.027780 2	0.4795211	-0.0579333	0.9538021
SellerGDavita	- 0.184253 4	0.6612570	-0.2786411	0.7805218
SellerGDawson	0.630347 7	0.6611202	0.9534540	0.3403664
SellerGDel	- 0.091268 9	0.1905842	-0.4788902	0.6320196
SellerGDingle	- 0.102998 8	0.1795376	-0.5736893	0.5661816
SellerGDixon	- 0.198840 8	0.3021440	-0.6580994	0.5104784

SellerGDomain	- 0.213129 0	0.2324340	-0.9169444	0.3591779
SellerGDonovan	- 0.417143 3	0.2869816	-1.4535539	0.1460787
SellerGDouglas	0.058932 7	0.1554881	0.3790172	0.7046773
SellerGEdward	0.047157 2	0.1737940	0.2713397	0.7861313
SellerGElite	0.567969 3	0.4004666	1.4182688	0.1561209
SellerGEmerson	0.102950 1	0.4797949	0.2145711	0.8301029
SellerGEric	0.077637 3	0.4802883	0.1616472	0.8715846
SellerGEview	0.050353 7	0.1566721	0.3213957	0.7479124
SellerGEvolve	0.017572 3	0.6608942	0.0265887	0.9787879
SellerGFirst	0.054439 8	0.3546562	0.1535001	0.8780048
SellerGFlanagan	0.421543 3	0.6613071	0.6374396	0.5238426
SellerGFlannagan	0.156636 8	0.2023620	0.7740425	0.4389107
SellerGFletchers	0.154676 4	0.1498958	1.0318932	0.3021290
SellerGFletchers/Fletchers	- 0.222323 4	0.2445478	-0.9091204	0.3632926
SellerGFletchers/Jellis	0.151821 2	0.6610960	0.2296508	0.8183644
SellerGFletchers/One	0.144833 5	0.6610875	0.2190838	0.8265860
SellerGFN	0.127469 6	0.1642325	0.7761533	0.4376635
SellerGFollett	0.520092 4	0.4793146	1.0850753	0.2778955
SellerGFor	3.387586 6	0.6611970	5.1234151	0.0000003

SellerGFrank	0.218916 7	0.1652712	1.3245904	0.1853154
SellerGFree	0.197755 8	0.4795580	0.4123710	0.6800700
SellerGFull	0.150354 1	0.6612335	0.2273843	0.8201262
SellerGGalldon	- 0.084342 5	0.3021073	-0.2791807	0.7801078
SellerGGardiner	0.002292 3	0.2347163	0.0097664	0.9922077
SellerGGarvey	0.126163 7	0.2721201	0.4636325	0.6429138
SellerGGary	0.040788 5	0.1522834	0.2678459	0.7888194
SellerGGeoff	- 0.522324 5	0.6613347	-0.7898035	0.4296477
SellerGGL	- 0.050582 0	0.1885361	-0.2682881	0.7884791
SellerGGold	0.070019 8	0.4794435	0.1460439	0.8838875
SellerGGr8	- 0.911518 9	0.6641544	-1.3724502	0.1699318
SellerGGrant's	- 0.038699 5	0.3269308	-0.1183721	0.9057735
SellerGGrantham	- 0.243539 2	0.4790885	-0.5083387	0.6112189
SellerGGreg	0.286537 5	0.1515340	1.8909129	0.0586439
SellerGgunn&Co	0.045025 6	0.2136819	0.2107132	0.8331122
SellerGH	0.172782 1	0.6611723	0.2613270	0.7938418
SellerGHall	0.308415 6	0.1876055	1.6439582	0.1001935

SellerGHam	- 0.240113 7	0.2381210	-1.0083688	0.3132842
SellerGHamilton	- 0.228965 9	0.3546219	-0.6456620	0.5185023
SellerGHAR	0.101067 3	0.1516009	0.6666668	0.5049892
SellerGHarcourts	0.085238 7	0.1503079	0.5670942	0.5706537
SellerGHarcourts/Harcourts	- 0.028674 8	0.6617649	-0.0433308	0.9654381
SellerGHarrington	0.075908 5	0.1861348	0.4078145	0.6834123
SellerGHarrison	- 0.022409 8	0.6608856	-0.0339087	0.9729501
SellerGHaughton	- 0.142578 1	0.1988371	-0.7170600	0.4733417
SellerGHaven	0.186525 2	0.6641059	0.2808667	0.7788143
SellerGHayeswinckle	- 0.217252 9	0.6612844	-0.3285316	0.7425116
SellerGhockingstuart	0.083275 1	0.1487516	0.5598261	0.5756015
SellerGhockingstuart/Advantage	0.325650 9	0.6611350	0.4925635	0.6223240
SellerGhockingstuart/ASL	0.774410 1	0.6611321	1.1713394	0.2414701
SellerGhockingstuart/Barry	0.115918 0	0.4003618	0.2895332	0.7721751
SellerGhockingstuart/Biggin	0.169476 3	0.6613653	0.2562522	0.7977575
SellerGhockingstuart/Buxton	0.118224 0	0.6612093	0.1787997	0.8580959
SellerGhockingstuart/Harcourts	- 0.006161 2	0.6611841	-0.0093185	0.9925651

SellerGhockingstuart/hockingstuart	0.2155129	0.1798939	1.1979998	0.2309249
SellerGhockingstuart/Jellis	-0.2803004	0.4791959	-0.5849390	0.5585923
SellerGhockingstuart/Kerr	0.2007635	0.6610914	0.3036849	0.7613697
SellerGhockingstuart/Marshall	1.0550784	0.6610944	1.5959572	0.1105071
SellerGhockingstuart/Sweeney	0.1890167	0.6613695	0.2857959	0.7750361
SellerGhockingstuart/Village	0.5963865	0.6613951	0.9017099	0.3672170
SellerGHodges	0.1358350	0.1512536	0.8980608	0.3691591
SellerGHodges/Buxton	0.8660312	0.6612278	1.3097319	0.1902948
SellerGHodges/Hodges	0.2422337	0.6613418	0.3662761	0.7141612
SellerGHolland	0.2192600	0.2718098	0.8066669	0.4198637
SellerGHome	0.4854670	0.2858231	1.6984880	0.0894243
SellerGHomes	-0.0648564	0.2854459	-0.2272110	0.8202610
SellerGHooper	1.0888949	0.4791920	2.2723562	0.0230708
SellerGHoskins	0.1851980	0.2382955	0.7771778	0.4370589
SellerGHume	-0.1646494	0.6609042	-0.2491275	0.8032635
SellerGHunter	-0.0742424	0.2287344	-0.3245792	0.7455014
SellerGIconek	-0.0120386	0.1711695	-0.0703312	0.9439305
SellerGiHomes	0.1168208	0.3241896	0.3603471	0.7185897



SellerGInner	0.333476 5	0.6612999	0.5042742	0.6140717
SellerGIntegrity	1.141778 5	0.6706278	1.7025516	0.0886606
SellerGiOne	- 0.067083 9	0.6613829	-0.1014298	0.9192099
SellerGiProperty	0.301570 4	0.6614427	0.4559282	0.6484443
SellerGiSell	- 0.016645 5	0.1678046	-0.0991955	0.9209836
SellerGiTRAK	0.192592 6	0.1751191	1.0997805	0.2714351
SellerGJ	0.150698 5	0.1966650	0.7662700	0.4435206
SellerGJacobs	- 0.247473 0	0.6617609	-0.3739614	0.7084352
SellerGJamie	0.339039 3	0.6610956	0.5128445	0.6080632
SellerGJanice	0.267109 4	0.6611611	0.4040004	0.6862148
SellerGJas	0.231772 5	0.1527420	1.5174120	0.1291714
SellerGJason	0.035947 5	0.1614365	0.2226728	0.8237914
SellerGJellis	0.298907 7	0.1487114	2.0099851	0.0444401
SellerGJim	0.091360 2	0.4007410	0.2279781	0.8196646
SellerGJK	0.385936 2	0.6612694	0.5836293	0.5594734
SellerGJMRE	- 0.168880 3	0.3244300	-0.5205447	0.6026872
SellerGJoe	- 0.008629 2	0.6612546	-0.0130498	0.9895881

SellerGJohnston	-	0.3547686	-0.1716697	0.8636982
	0.060903			
	0			
SellerGJoseph	-	0.3546144	-0.1457141	0.8841479
	0.051672			
	3			
SellerGJRW	0.042151	0.2274196	0.1853487	0.8529565
	9			
SellerGJudith	0.299116	0.6612075	0.4523796	0.6509983
	8			
SellerGJust	0.033720	0.3572280	0.0943958	0.9247953
	8			
SellerGJustin	-	0.3028483	-6.1549945	0.0000000
	1.864029			
	4			
SellerGJY	0.031072	0.4791919	0.0648427	0.9482996
	1			
SellerGK.R.Peters	0.418435	0.3248678	1.2880187	0.1977477
	8			
SellerGKaren	-	0.6611321	-1.0204069	0.3075423
	0.674623			
	7			
SellerGKay	1.241518	0.1552121	7.9988505	0.0000000
	0			
SellerGKaye	0.189277	0.3642583	0.5196247	0.6033283
	6			
SellerGKeatings	0.701270	0.4852279	1.4452390	0.1483994
	2			
SellerGKelly	0.602190	0.4004521	1.5037771	0.1326475
	7			
SellerGKen	-	0.3548704	-0.3838226	0.7011122
	0.136207			
	3			
SellerGKennedy	1.373755	0.6654684	2.0643431	0.0389923
	0			
SellerGL	0.458911	0.3259383	1.4079716	0.1591480
	8			
SellerGLandfield	-	0.4792316	-0.6460001	0.5182834
	0.309583			
	6			

SellerGLangwell	- 0.272566 1	0.3547577	-0.7683161	0.4423044
SellerGLE	0.122025 8	0.2253544	0.5414841	0.5881773
SellerGLeaders	- 0.189738 2	0.4792594	-0.3958989	0.6921820
SellerGLeading	0.577918 9	0.2737086	2.1114387	0.0347414
SellerGLEased	0.336885 9	0.4003518	0.8414745	0.4000877
SellerGLEeburn	0.566711 1	0.1996295	2.8388150	0.0045307
SellerGLEyton	0.058568 8	0.2121090	0.2761260	0.7824528
SellerGLindellas	0.410214 6	0.1787075	2.2954526	0.0217129
SellerGLittle	- 0.424738 9	0.6612999	-0.6422788	0.5206963
SellerGLITTLE	- 0.135049 4	0.1671544	-0.8079321	0.4191350
SellerGLJ	0.027495 8	0.1565846	0.1755972	0.8606114
SellerGLJH	- 0.067160 5	0.2849976	-0.2356529	0.8137033
SellerGLLC	0.627765 9	0.2156485	2.9110601	0.0036042
SellerGLove	0.115438 9	0.1527233	0.7558698	0.4497321
SellerGLuxe	- 0.669767 8	0.4791913	-1.3977042	0.1622104
SellerGLuxton	- 0.098044 2	0.6611278	-0.1482985	0.8821081
SellerGM.J	0.149282 3	0.2072906	0.7201594	0.4714315

SellerGMaddison	-	0.3547496	-0.4029026	0.6870222
	0.1429295			
SellerGMaitland	-	0.2325790	-0.6095756	0.5421468
	0.1417745			
SellerGMandy	0.1201516	0.4791574	0.2507560	0.8020042
SellerGMark	0.4684190	0.6706568	0.6984481	0.4849015
SellerGMarket	0.0262808	0.6613502	0.0397382	0.9683021
SellerGMarshall	0.8261954	0.1496657	5.5202713	0.0000000
SellerGMarvelli	0.2532820	0.6613762	0.3829621	0.7017501
SellerGMason	0.0701212	0.2030802	0.3452882	0.7298797
SellerGMatthew	-	0.3243190	-0.2454723	0.8060921
	0.0796113			
SellerGMax	0.2964727	0.1843115	1.6085411	0.1077254
SellerGMcDonald	0.3066812	0.1638160	1.8721085	0.0611996
SellerGMcEwing	0.7466316	0.6617609	1.1282497	0.2592219
SellerGMcGrath	0.2009614	0.1503561	1.3365695	0.1813716
SellerGMcGrath/First	-	0.6611693	-0.4404734	0.6595969
	0.2912275			
SellerGMcGrath/Langwell	-	0.3553573	-0.3184812	0.7501218
	0.1131746			
SellerGMcLennan	-	0.1991393	-0.1964460	0.8442622
	0.0391201			
SellerGMcNaughton	-	0.6612844	-0.0227770	0.9818282
	0.0150621			

SellerGMeadows	0.137620 0	0.4791686	0.2872057	0.7739564
SellerGMega	0.575043 0	0.6611709	0.8697342	0.3844515
SellerGMelbourne	- 0.095964 7	0.1857476	-0.5166401	0.6054106
SellerGMethven	- 0.227414 5	0.4826962	-0.4711338	0.6375481
SellerGMetro	- 0.199237 2	0.6611122	-0.3013667	0.7631366
SellerGMICM	- 0.130376 2	0.1643603	-0.7932344	0.4276465
SellerGMiles	0.354589 4	0.1530407	2.3169617	0.0205114
SellerGMillership	0.034717 6	0.1683887	0.2061755	0.8366550
SellerGMindacom	0.844127 6	0.6645396	1.2702441	0.2040058
SellerGMitchell	0.023820 0	0.3244827	0.0734091	0.9414810
SellerGMJ	0.019025 9	0.3549458	0.0536022	0.9572524
SellerGMoonee	- 0.140297 8	0.1654625	-0.8479131	0.3964920
SellerGMorleys	- 0.342777 4	0.2612667	-1.3119829	0.1895342
SellerGMorrison	0.257374 8	0.1561497	1.6482568	0.0993086
SellerGMunn	- 0.342067 0	0.2625347	-1.3029400	0.1926035
SellerGNaison	0.126288 1	0.6613431	0.1909571	0.8485603

SellerGNardella	- 0.110814 8	0.4006311	-0.2766006	0.7820884
SellerGNelson	0.176177 4	0.1487884	1.1840800	0.2363892
SellerGNew	- 0.250530 7	0.2851109	-0.8787129	0.3795628
SellerGNexus	- 0.089736 2	0.3555747	-0.2523694	0.8007570
SellerGNguyen	0.191359 9	0.2855877	0.6700563	0.5028262
SellerGNicholas	1.420600 8	0.6617609	2.1466979	0.0318239
SellerGNicholls	0.129374 1	0.4018609	0.3219375	0.7475019
SellerGNicholson	0.163815 5	0.2379396	0.6884749	0.4911582
SellerGNick	0.837861 3	0.1677671	4.9941916	0.0000006
SellerGNoel	0.145102 1	0.1507182	0.9627380	0.3356854
SellerGNorth	1.139148 9	0.6610946	1.7231254	0.0848744
SellerGO'Brien	- 0.048602 7	0.1523211	-0.3190802	0.7496676
SellerGO'Donoghues	- 0.097246 7	0.2720066	-0.3575158	0.7207078
SellerGO'Brien	0.100144 4	0.2070881	0.4835836	0.6286843
SellerGO'Brien	0.083913 1	0.2023898	0.4146114	0.6784289
SellerGOne	0.246160 4	0.1939761	1.2690241	0.2044406
SellerGOnly	0.057096 4	0.4813571	0.1186156	0.9055806

SellerGOpen	- 0.618627 2	0.6612087	-0.9356006	0.3494851
SellerGOriental	- 0.132431 0	0.4794507	-0.2762140	0.7823853
SellerGOutlook	0.306561 8	0.4792022	0.6397338	0.5223497
SellerGOWen	- 0.431502 8	0.4791139	-0.9006269	0.3677927
SellerGP	- 0.002025 5	0.3021222	-0.0067044	0.9946508
SellerGPagan	0.084086 6	0.1775716	0.4735360	0.6358337
SellerGParkes	0.295262 1	0.1795859	1.6441269	0.1001587
SellerGParkinson	2.303558 7	0.6613754	3.4829823	0.0004964
SellerGPaul	0.291954 2	0.2276674	1.2823717	0.1997205
SellerGPavilion	0.507173 3	0.6613872	0.7668326	0.4431861
SellerGPeake	0.723459 4	0.3073384	2.3539503	0.0185804
SellerGPeninsula	- 0.181351 9	0.6612994	-0.2742357	0.7839051
SellerGPeople	0.472800 1	0.3548995	1.3322085	0.1828000
SellerGPeter	- 0.057195 5	0.1740800	-0.3285584	0.7424914
SellerGPhilip	0.113822 7	0.1547144	0.7356960	0.4619205
SellerGPoint	- 0.002710 5	0.1992442	-0.0136039	0.9891461
SellerGPRD	0.110492 0	0.6615244	0.1670264	0.8673502

SellerGPRDNationwide	- 0.013188 0	0.1879692	-0.0701605	0.9440663
SellerGPride	0.242753 8	0.2163945	1.1218116	0.2619500
SellerGPrime	- 0.191206 2	0.6612013	-0.2891799	0.7724453
SellerGPrivate/Tiernan's	0.635793 5	0.6611676	0.9616222	0.3362458
SellerGProf	- 0.544074 9	0.4002569	-1.3593144	0.1740554
SellerGProf.	0.114975 7	0.1599996	0.7185997	0.4723922
SellerGProfessionals	- 0.106845 3	0.1929723	-0.5536819	0.5798000
SellerGProperty	0.311525 8	0.2098164	1.4847544	0.1376176
SellerGPropertyau	- 1.228593 0	0.6611927	-1.8581466	0.0631563
SellerGProwse	- 0.434928 3	0.4792099	-0.9075946	0.3640985
SellerGPSP	0.193855 0	0.6612694	0.2931558	0.7694047
SellerGPurplebricks	- 0.029565 5	0.1573981	-0.1878392	0.8510037
SellerGQuinta	0.414576 8	0.6612888	0.6269224	0.5307140
SellerGR&H	- 0.064454 3	0.2852136	-0.2259860	0.8212136
SellerGRaine	0.076756 0	0.1518067	0.5056163	0.6131291
SellerGRaine&Horne	- 0.144165 9	0.6615294	-0.2179283	0.8274862



SellerGGray	-	0.1485725	-0.0097534	0.9922181
	0.001449			
	1			
SellerGRe	-	0.2443202	-0.5323170	0.5945097
	0.130055			
	8			
SellerGRE	0.150721	0.1878675	0.8022747	0.4223993
	4			
SellerGReach	-	0.3546405	-0.6155127	0.5382200
	0.218285			
	8			
SellerGReal	0.258104	0.3548332	0.7273971	0.4669874
	6			
SellerGRed	0.188425	0.2607521	0.7226243	0.4699154
	8			
SellerGRedina	-	0.4792267	-0.3119811	0.7550567
	0.149509			
	7			
SellerGReed	-	0.6611716	-0.1536726	0.8778687
	0.101604			
	0			
SellerGRegal	-	0.6608870	-0.1892562	0.8498931
	0.125077			
	0			
SellerGReliance	0.029320	0.1848696	0.1585994	0.8739854
	2			
SellerGREMAX	-	0.2550321	-0.6201726	0.5351480
	0.158163			
	9			
SellerGRenderina	0.099717	0.1637149	0.6090920	0.5424673
	4			
SellerGRexhepi	0.388925	0.4813690	0.8079563	0.4191210
	1			
SellerGRichardson	-	0.6612618	-0.2450621	0.8064097
	0.162050			
	2			
SellerGRistic	0.052029	0.3241752	0.1604977	0.8724900
	4			
SellerGRodney	0.082429	0.2024795	0.4071023	0.6839353
	9			

SellerGRoger	0.329146 1	0.4006062	0.8216200	0.4112986
SellerGRombotis	0.417935 3	0.6611175	0.6321650	0.5272831
SellerGRosin	- 0.012031 9	0.4004397	-0.0300467	0.9760299
SellerGRoss	- 0.318782 8	0.2719533	-1.1721969	0.2411257
SellerGRounds	0.189787 1	0.3547211	0.5350318	0.5926311
SellerGRT	0.556591 6	0.1522767	3.6551331	0.0002574
SellerGRuralco	0.145646 4	0.6781715	0.2147633	0.8299530
SellerGRW	0.049312 2	0.1517577	0.3249402	0.7452282
SellerGRyder	0.002709 1	0.2296691	0.0117955	0.9905889
SellerGS&L	0.349808 7	0.1861292	1.8793870	0.0601997
SellerGSanctuary	0.161661 6	0.4794518	0.3371801	0.7359831
SellerGSandhurst	- 0.538294 3	0.6617893	-0.8133923	0.4159985
SellerGSavoy	- 0.099619 0	0.6619310	-0.1504976	0.8803729
SellerGSchroeder	0.158522 4	0.1909395	0.8302232	0.4064181
SellerGScott	- 0.230531 3	0.2379025	-0.9690160	0.3325437
SellerGSell	0.020316 0	0.2719560	0.0747034	0.9404511
SellerGShape	- 0.507160 1	0.3553046	-1.4273955	0.1534745

SellerGShine	- 0.475460 4	0.6612094	-0.7190770	0.4720981
SellerGSilver	0.124619 8	0.6613788	0.1884242	0.8505452
SellerGSkad	0.139869 0	0.2608243	0.5362576	0.5917838
SellerGSmart	- 0.492732 1	0.4790885	-1.0284783	0.3037317
SellerGSotheby's	3.251364 9	0.2854242	11.3913430	0.0000000
SellerGSpace	- 0.030103 4	0.6611173	-0.0455341	0.9636819
SellerGSteller	0.255660 0	0.3021016	0.8462716	0.3974068
SellerGSteveway	- 0.055807 0	0.6612974	-0.0843901	0.9327467
SellerGStockdale	- 0.028260 1	0.1507195	-0.1875014	0.8512686
SellerGSurreal	0.143101 9	0.4013742	0.3565299	0.7214458
SellerGSutherland	- 0.517610 6	0.6626624	-0.7811075	0.4347444
SellerGSweeney	0.129274 9	0.1520867	0.8500082	0.3953261
SellerGSweeney/Advantage	- 0.041397 9	0.4795340	-0.0863294	0.9312051
SellerGSweeney/Burnham	0.101638 9	0.6613762	0.1536780	0.8778645
SellerGT	1.226448 2	0.6617863	1.8532390	0.0638562
SellerGThe	0.262210 5	0.1918649	1.3666411	0.1717463
SellerGThomas	0.175672 3	0.2096296	0.8380126	0.4020292

SellerGThomson	0.018370 9	0.1610038	0.1141025	0.9091572
SellerGTiernan's	- 0.234611 5	0.6612008	-0.3548265	0.7227217
SellerGTim	- 0.084766 2	0.1936399	-0.4377518	0.6615688
SellerGTown	- 0.009081 7	0.6613006	-0.0137331	0.9890430
SellerGTrimson	0.212113 0	0.2281504	0.9297071	0.3525290
SellerGTriwest	0.111820 3	0.1929365	0.5795705	0.5622079
SellerGTRUE	- 0.057333 6	0.4807984	-0.1192466	0.9050807
SellerGTTS	- 0.097657 8	0.6611411	-0.1477110	0.8825716
SellerGU	0.003506 0	0.1989243	0.0176249	0.9859382
SellerGUFIRST	- 0.189241 9	0.4808393	-0.3935657	0.6939040
SellerGUnited	0.206798 2	0.3548915	0.5827084	0.5600933
SellerGUnity	0.030561 6	0.6613379	0.0462118	0.9631417
SellerGUpper	1.002801 1	0.6613099	1.5163860	0.1294305
SellerGUpSide	0.270629 2	0.2608441	1.0375131	0.2995037
SellerGVeitch	- 0.226197 2	0.6617620	-0.3418104	0.7324955
SellerGVic	0.044780 7	0.6611278	0.0677338	0.9459979
SellerGVicprop	0.160874 2	0.6613214	0.2432618	0.8078040

SellerGVICProp	1.710690 8	0.3545908	4.8244090	0.0000014
SellerGVICPROP	0.001275 6	0.2521309	0.0050591	0.9959634
SellerGVictory	- 0.684995 8	0.6612662	-1.0358852	0.3002626
SellerGVillage	0.266473 2	0.1572446	1.6946412	0.0901521
SellerGvoglwalpole	- 0.119498 6	0.6613452	-0.1806903	0.8566117
SellerGW.B.	- 0.113204 8	0.2278997	-0.4967306	0.6193820
SellerGWalsh	- 0.094460 6	0.3239470	-0.2915927	0.7705997
SellerGWalshe	0.047742 8	0.1666069	0.2865594	0.7744514
SellerGWeast	0.787718 1	0.4791400	1.6440248	0.1001797
SellerGWeda	0.624816 6	0.4007516	1.5591118	0.1189786
SellerGWeston	0.111926 6	0.3547442	0.3155136	0.7523735
SellerGWestside	- 0.038095 7	0.2447970	-0.1556217	0.8763321
SellerGWHITEFOX	0.964220 6	0.4007417	2.4060897	0.0161293
SellerGWhiting	- 0.107012 8	0.1836067	-0.5828370	0.5600066
SellerGWilliam	- 0.188592 2	0.1992229	-0.9466388	0.3438292
SellerGWilliams	0.322333 6	0.1570241	2.0527649	0.0401025
SellerGWilson	0.263772 7	0.1822438	1.4473621	0.1478042

SellerGWin	- 0.190795 5	0.1686235	-1.1314879	0.2578573
SellerGWood	- 0.097779 8	0.4004523	-0.2441734	0.8070979
SellerGWoodards	0.110382 1	0.1504347	0.7337541	0.4631033
SellerGWoodards/hockingstuart	- 0.347887 5	0.6611611	-0.5261766	0.5987687
SellerGWoodards/Peter	0.279868 5	0.6611457	0.4233084	0.6720728
SellerGWyndham	0.069308 4	0.2526566	0.2743188	0.7838412
SellerGXynergy	- 0.258929 8	0.6611629	-0.3916278	0.6953356
SellerGYPA	0.021830 7	0.1500202	0.1455185	0.8843024
SellerGZahn	0.097208 7	0.4809149	0.2021328	0.8398140
SellerGZed	0.195625 6	0.4008418	0.4880369	0.6255267
CouncilAreaBayside City Council	1.212635 5	0.0342195	35.4369769	0.0000000
CouncilAreaBoroondara City Council	1.081720 2	0.0319996	33.8041906	0.0000000
CouncilAreaBrimbank City Council	- 0.217667 1	0.0459349	-4.7385995	0.0000022
CouncilAreaCardinia Shire Council	0.769124 6	0.1354029	5.6802676	0.0000000
CouncilAreaCasey City Council	0.497045 7	0.0635742	7.8183588	0.0000000
CouncilAreaDarebin City Council	0.264570 6	0.0262996	10.0598653	0.0000000
CouncilAreaFrankston City Council	0.924226 7	0.0565117	16.3546119	0.0000000
CouncilAreaGlen Eira City Council	0.744314 5	0.0339391	21.9309073	0.0000000

CouncilAreaGreater Dandenong City Council	0.3879229	0.0540479	7.1773874	0.0000000
CouncilAreaHobsons Bay City Council	0.1070749	0.0528603	2.0256215	0.0428109
CouncilAreaHume City Council	-0.0973703	0.0297406	-3.2739828	0.0010614
CouncilAreaKingston City Council	0.7471547	0.0406288	18.3897935	0.0000000
CouncilAreaKnox City Council	0.1156917	0.0374950	3.0855192	0.0020335
CouncilAreaMacedon Ranges Shire Council	0.9225173	0.1132179	8.1481564	0.0000000
CouncilAreaManningham City Council	0.2983779	0.0282142	10.5754336	0.0000000
CouncilAreaMaribyrnong City Council	-0.0455885	0.0510151	-0.8936281	0.3715268
CouncilAreaMaroondah City Council	0.1906067	0.0351387	5.4244081	0.0000001
CouncilAreaMelbourne City Council	0.5223520	0.0308056	16.9564137	0.0000000
CouncilAreaMelton City Council	-0.2156321	0.0582009	-3.7049620	0.0002117
CouncilAreaMitchell Shire Council	0.4938063	0.1734351	2.8472103	0.0044129
CouncilAreaMonash City Council	0.5503155	0.0278804	19.7384534	0.0000000
CouncilAreaMoonee Valley City Council	0.3304712	0.0475814	6.9453796	0.0000000
CouncilAreaMoorabool Shire Council	0.3099806	0.3459045	0.8961450	0.3701813
CouncilAreaMoreland City Council	0.2019617	0.0282590	7.1468129	0.0000000
CouncilAreaMurrindindi Shire Council	1.2707861	0.6495827	1.9563115	0.0504361
CouncilAreaNillumbik Shire Council	-0.1220442	0.0866039	-1.4092231	0.1587778

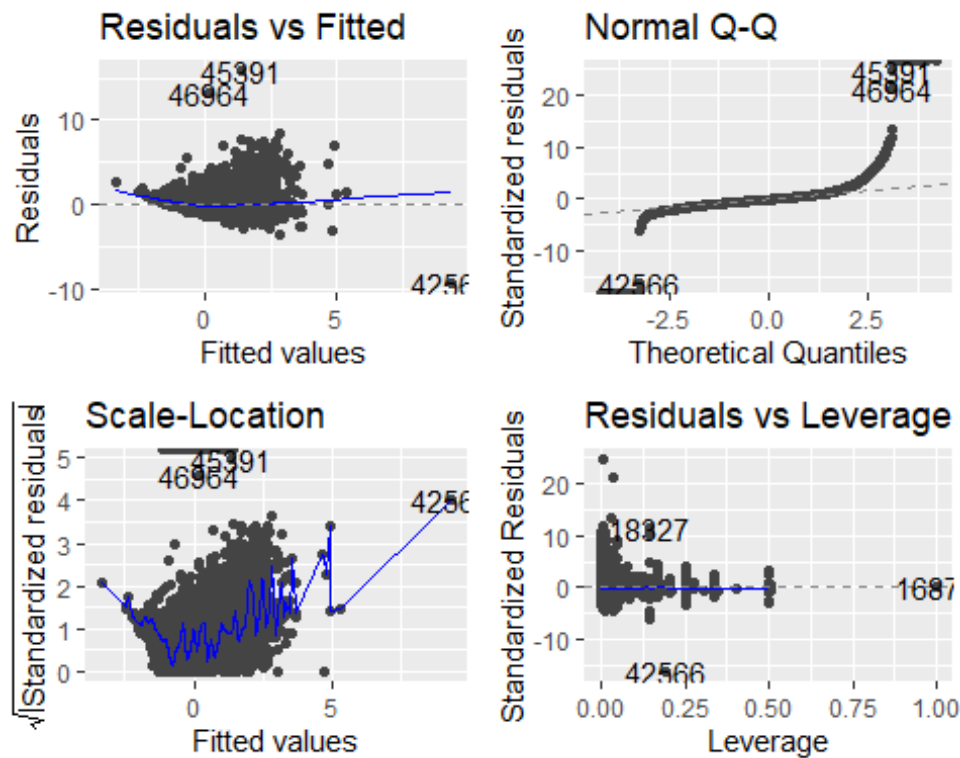
CouncilAreaPort Phillip City Council	0.698449 3	0.0378731	18.4418285	0.0000000
CouncilAreaStonnington City Council	1.146750 8	0.0369977	30.9952259	0.0000000
CouncilAreaWhitehorse City Council	0.312467 3	0.0311265	10.0386234	0.0000000
CouncilAreaWhittlesea City Council	0.006014 3	0.0307704	0.1954574	0.8450360
CouncilAreaWyndham City Council	- 0.284655 8	0.0493940	-5.7629630	0.0000000
CouncilAreaYarra City Council	0.538701 8	0.0339665	15.8598155	0.0000000
CouncilAreaYarra Ranges Shire Council	0.322013 6	0.0935163	3.4433940	0.0005751

*#Diagnostic plots*

**autoplot**(Ful.Mod)

## Warning: Removed 57 rows containing missing values (geom\_point).

## Warning: Removed 194 row(s) containing missing values (geom\_path).



#Training data performance metric test



```

# Compute R^2 from true and predicted values
eval_results <- function(true, predicted, df) {
  SSE <- sum((predicted - true)^2)
  SST <- sum((true - mean(true))^2)
  R_square <- 1 - SSE / SST
  RMSE = sqrt(SSE/nrow(df))

  # Model performance metrics
  data.frame(
    RMSE = RMSE,
    Rsquare = R_square
  )
}

# Prediction and evaluation on train data
predictions_training1<- predict(Ful.Model)
eval_results(training$Price, predictions_training1, training1)

##          RMSE  Rsquare
## 1 380306.2 0.608659

test1<-na.omit(test1)
Ful.Model1<-lm(Price~Distance+Type+Rooms+Regionname+SellerG+CouncilArea,data=test1)
Model1<-summary(Ful.Model1)
kable(Model1$coefficients,caption="Table12: Multiple Regression Train Coefficients")

```

Table12: Multiple Regression Train Coefficients

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	569912.2190	238334.679	2.3912266	0.0168084
Distance	-26196.0759	1240.061	-21.1248203	0.0000000
Typet	-224475.4617	10846.829	-20.6950315	0.0000000
Typeu	-410181.5481	10042.674	-40.8438562	0.0000000
Rooms	230554.2529	4269.288	54.0029709	0.0000000
RegionnameEastern Victoria	-69867.6303	71411.468	-0.9783811	0.3279067

RegionnameNorthern Metropolitan	- 151598.562 1	23078.175  -	- 6.5689146	0.000000 0
RegionnameNorthern Victoria	116149.230 6	80961.694	1.4346196	0.151423 1
RegionnameSouth-Eastern Metropolitan	- 109673.308 9	29263.158	- 3.7478289	0.000179 3
RegionnameSouthern Metropolitan	- 110356.782 9	24091.064	- 4.5808182	0.000004 7
RegionnameWestern Metropolitan	- 117530.327 9	39921.567	- 2.9440309	0.003246 2
RegionnameWestern Victoria	60137.4492	79833.686	0.7532841	0.451294 8
SellerGA	- 35223.7702	334761.31 8	- 0.1052206	0.916202 7
SellerGAbercromby's	485369.969 1	262162.69 2	1.8514075	0.064136 9
SellerGAce	- 62805.2843	410524.73 6	- 0.1529878	0.878410 6
SellerGAIME	- 262653.651 1	410570.61 5	- 0.6397283	0.522362 2
SellerGAirport	- 491803.423 9	410359.50 4	- 1.1984697	0.230759 2
SellerGAlex	- 136916.792 9	418906.95 4	- 0.3268430	0.743792 7
SellerGAlexkarbon	- 73509.9504	249036.41 4	- 0.2951775	0.767863 7
SellerGAllan	- 203326.285 0	410233.20 6	- 0.4956359	0.620161 0
SellerGAllens	- 237618.794 1	280494.77 0	- 0.8471416	0.396934 1
SellerGAnderson	198747.518 6	335841.31 9	0.5917900	0.554003 0

SellerGAppleby	-	306049.04	-	0.792950
	80334.1064	6	0.2624877	2
SellerGAquire	198647.434	275418.17	0.7212575	0.470765
	1	7		9
SellerGARbee	-	474553.28	-	0.967526
	19320.0703	4	0.0407121	1
SellerGArea	22162.6702	256997.31	0.0862370	0.931279
		4		6
SellerGAscend	30463.7789	410050.43	0.0742928	0.940778
		8		7
SellerGASL	98712.3010	334740.09	0.2948924	0.768081
		7		5
SellerGAsset	59083.9325	306275.32	0.1929112	0.847032
		8		0
SellerGAssisi	-	334941.16	-	0.164300
	465850.626	8	1.3908431	3
	5			
SellerGAustralian	-	410262.99	-	0.849052
	78085.9341	6	0.1903314	8
SellerGAvion	459281.563	410232.51	1.1195640	0.262923
	1	5		3
SellerGBarlow	206311.485	251835.31	0.8192317	0.412671
	6	5		4
SellerGBarry	-	236978.47	-	0.906321
	27888.2015	5	0.1176824	4
SellerGBayside	-	273779.92	-	0.763165
	82499.2079	9	0.3013340	3
SellerGBekdon	134100.666	259493.71	0.5167781	0.605321
	7	4		1
SellerGBell	67679.9169	423900.13	0.1596601	0.873151
		1		7
SellerGBeller	-	262046.74	-	0.420249
	211214.398	3	0.8060180	3
	2			
SellerGBells	-	243087.30	-	0.795606
	62970.2302	5	0.2590437	2
SellerGBenlor	7360.9041	281059.97	0.0261898	0.979106
		7		4
SellerGBiggin	20660.7672	237981.11	0.0868168	0.930818
		1		6

SellerGBlack	278827.052 1	410698.82 4	0.6789088	0.497209 5
SellerGBoutique	- 56297.6779	335541.91 3	- 0.1677814	0.866758 3
SellerGBowman	- 131354.454 1	274893.72 6	- 0.4778372	0.632775 3
SellerGBrace	97962.0192	305782.90 7	0.3203646	0.748697 9
SellerGBrad	- 11464.3091	237962.18 1	- 0.0481770	0.961576 0
SellerGBranon	-142.1415	335122.65 0	- 0.0004241	0.999661 6
SellerGBuckingham	85289.4847	241301.81 8	0.3534556	0.723753 5
SellerGBullen	- 28908.6390	335268.47 9	- 0.0862253	0.931288 8
SellerGBurnham	32491.5994	248949.14 1	0.1305150	0.896161 3
SellerGBurns	- 252178.149 7	335521.88 8	- 0.7515997	0.452307 4
SellerGBustin	- 171085.934 1	410262.99 6	- 0.4170153	0.676675 1
SellerGBuxton	40041.4408	237475.66 2	0.1686128	0.866104 2
SellerGBuxton/Advantage	- 175667.414 5	410510.06 9	- 0.4279247	0.668714 0
SellerGBuxton/Buxton	18472.5650	335101.35 7	0.0551253	0.956039 6
SellerGBuxton/Marshall	277316.634 3	410492.97 5	0.6755697	0.499327 6
SellerGBuxton/O'Brien	184364.929 2	410331.98 3	0.4493067	0.653219 0
SellerGbuyMyplace	158165.154 1	273599.24 2	0.5780906	0.563214 4
SellerGC	- 116756.341 3	411363.28 8	- 0.2838278	0.776547 5

SellerGC21	-	240689.14	-	0.691056
	95657.4225	1	0.3974314	8
SellerGCaine	-	280401.21	-	0.624291
	137338.116	9	0.4897914	0
	4			
SellerGCalder	42194.4217	280640.45	0.1503505	0.880490
		8		8
SellerGCarter	36814.4934	246805.00	0.1491643	0.881426
		8		6
SellerGCastran	54233.6570	280493.04	0.1933512	0.846687
		5		4
SellerGCASTRAN	-	410156.42	-	0.279184
	443872.892	4	1.0822039	9
	3			
SellerGCayzer	72092.7038	244072.01	0.2953747	0.767713
		4		0
SellerGCentury	-	280649.78	-	0.654197
	125717.135	0	0.4479502	7
	4			
SellerGChambers	9424.9811	290232.98	0.0324738	0.974094
		9		7
SellerGChanging	-	335231.39	-	0.382739
	292621.267	9	0.8728934	7
	6			
SellerGCharlton	-	265335.39	-	0.920241
	26568.3672	8	0.1001313	9
SellerGChisholm	72570.5023	241946.15	0.2999448	0.764224
		4		7
SellerGChristopher	-	280421.48	-	0.466090
	204393.299	9	0.7288789	8
	7			
SellerGClairmont	86916.4221	410588.55	0.2116874	0.832354
		4		7
SellerGCocoon	-	410561.74	-	0.810510
	98441.6271	3	0.2397730	6
SellerGCollings	48362.9477	290100.97	0.1667107	0.867600
		4		6
SellerGCollins	278414.455	244000.61	1.1410400	0.253877
	0	4		4
SellerGCommercial	143301.584	410484.98	0.3491031	0.727018
	1	9		4

SellerGCommunity	- 415513.32	- 0.543151
	252662.030 5	0.6080720 9
	0	
SellerGCompton	263914.169 281096.46	0.9388740 0.347815
	1 7	4
SellerGConsidine	- 245946.18	- 0.861639
	42866.4031 7	0.1742918 3
SellerGCoventry	- 306377.74	- 0.855605
	55752.9861 0	0.1819747 9
SellerGCrane	-7181.9579 306808.73	- 0.981324
	2	0.0234086 8
SellerGCreate	- 410138.49	- 0.813268
	96881.9538 5	0.2362177 0
SellerGD'Aprano	- 306002.19	- 0.763818
	91946.7075 3	0.3004773 6
SellerGDaniel	- 273827.86	- 0.753303
	86062.5266 5	0.3142943 3
SellerGDarras	- 290439.36	- 0.780968
	80760.5139 8	0.2780632 9
SellerGDarren	127779.878 240742.24	0.5307746 0.595585
	1 6	3
SellerGDel	- 254181.07	- 0.770731
	74074.7434 6	0.2914251 6
SellerGDingle	- 250660.29	- 0.452893
	188152.222 5	0.7506263 1
	2	
SellerGDirect	- 410454.32	- 0.547479
	246912.508 1	0.6015590 7
	1	
SellerGDixon	10290.4994 305926.07	0.0336372 0.973167
	2	0
SellerGDomain	- 305993.60	- 0.554634
	180795.381 2	0.5908469 8
	1	
SellerGDonovan	- 411191.13	- 0.283736
	440802.756 1	1.0720143 4
	1	
SellerGDouglas	- 240818.52	- 0.941179
	17769.9173 0	0.0737897 1

SellerGEdward	- 250227.11 134245.279 8	- 0.5364937 5	0.591627 9
SellerGElite	292413.722 7	410364.46 8	0.7125708 0.476126 1
SellerGEnrich	- 409875.19 357163.516 2	- 0.8713958 5	0.383556 5
SellerGEric	- 336677.35 44717.9960	- 0.1328215 0	0.894336 9
SellerGView	49535.3280	243092.06 7	0.2037719 0.838535 4
SellerGFinders	521113.886 4	410457.21 7	1.2695937 0.204255 4
SellerGFirst	510934.709 7	410799.56 0	1.2437567 0.213614 8
SellerGFlannagan	201688.499 7	273645.53 9	0.7370429 0.461111 5
SellerGFletchers	17481.4798	237784.98 0	0.0735180 0.941395 2
SellerGFletchers/Fletchers	- 268704.92 133347.683 0	- 0.4962607 5	0.619720 1
SellerGFletchers/One	80099.7877	410146.76 1	0.1952954 0.845165 2
SellerGFN	- 247264.02 30751.9391	- 0.1243688 9	0.901025 5
SellerGFrank	103513.671 8	250048.33 7	0.4139746 0.678900 5
SellerGFree	44476.9112	335635.28 0	0.1325156 0.894578 8
SellerGGalldon	269956.149 9	410262.79 4	0.6580079 0.510546 4
SellerGGardiner	- 290770.65 189497.423 2	- 0.6517075 9	0.514603 1
SellerGGarvey	90152.4681	305934.91 2	0.2946786 0.768244 8
SellerGGary	25159.6311	239004.28 0	0.1052685 0.916164 6

SellerGGL	-	268900.73	-	0.894688
	35596.2396	6	0.1323769	6
SellerGGrant's	-	415276.18	-	0.658342
	183641.019	0	0.4422142	6
	0			
SellerGGreg	79427.6049	238775.28	0.3326458	0.739407
		3		8
SellerGgunn&Co	53722.1561	335104.68	0.1603145	0.872636
		3		2
SellerGH	300911.002	409860.01	0.7341800	0.462854
	9	0		2
SellerGHall	-	269503.84	-	0.337429
	258534.216	4	0.9592970	6
	1			
SellerGHam	-	290365.36	-	0.448984
	219846.046	3	0.7571359	2
	5			
SellerGHamilton	-	334861.79	-	0.805801
	82326.5167	8	0.2458522	1
SellerGHAR	-3366.1728	238801.48	-	0.988753
		8	0.0140961	5
SellerGHarcourts	-	237993.88	-	0.842411
	47316.6057	8	0.1988144	5
SellerGHarrington	-6218.8735	259612.23	-	0.980889
		5	0.0239545	3
SellerGHaughton	-	256313.58	-	0.425955
	204066.716	0	0.7961604	5
	0			
SellerGhockingstuart	-	237187.61	-	0.947602
	15587.6621	5	0.0657187	9
SellerGhockingstuart/ASL	438337.711	410119.12	1.0688058	0.285179
	4	4		9
SellerGhockingstuart/Barry	-	410138.49	-	0.895481
	53881.9538	5	0.1313750	0
SellerGhockingstuart/Buxton	22024.9544	410389.66	0.0536684	0.957200
		9		3
SellerGhockingstuart/hockingstuart	-	253718.31	-	0.880941
	38001.6214	9	0.1497788	8
SellerGhockingstuart/Jellis	-	410257.18	-	0.647634
	187513.624	2	0.4570636	1
	1			



SellerGHodges	-8439.1057	238434.47	-	0.971766
		0	0.0353938	3
SellerGHolland	156293.496	305795.18	0.5111052	0.609287
	2	8		4
SellerGHome	467281.246	335610.82	1.3923307	0.163849
	4	7		6
SellerGHomes	-	305973.49	-	0.668487
	131029.021	5	0.4282365	1
	5			
SellerGHooper	-	410151.01	-	0.642358
	190480.740	0	0.4644161	6
	5			
SellerGHoskins	235722.529	280791.74	0.8394924	0.401210
	1	8		8
SellerGHunter	-	306772.84	-	0.790162
	81634.2004	3	0.2661063	1
SellerGIconek	-	245437.31	-	0.892246
	33248.2309	9	0.1354653	4
SellerGiHomes	-	334808.67	-	0.794811
	87074.9032	9	0.2600736	7
SellerGInner	120559.633	410516.84	0.2936777	0.769009
	5	2		6
SellerGIntegrity	537580.575	424033.92	1.2677773	0.204903
	5	7		5
SellerGiSell	30151.6774	248106.47	0.1215272	0.903275
		7		6
SellerGiTRAK	-	248986.30	-	0.799174
	63347.4823	5	0.2544216	5
SellerGJ	-	268951.76	-	0.779451
	75317.3734	9	0.2800404	6
SellerGJas	49274.6086	239321.45	0.2058930	0.836878
		9		2
SellerGJason	-	243936.41	-	0.894891
	32228.8473	2	0.1321199	8
SellerGJellis	104324.589	237102.09	0.4399986	0.659946
	6	0		5
SellerGJMRE	-	410413.01	-	0.640069
	191914.725	5	0.4676136	9
	0			
SellerGJoe	-	410468.80	-	0.935291
	33326.2970	4	0.0811908	6

SellerGJohnston	-	410436.85	-	0.170820
	562158.119	2	1.3696580	8
	4			
SellerGJoseph	-	410119.12	-	0.207772
	516662.288	4	1.2597859	5
	6			
SellerGJRW	-	334740.88	-	0.719368
	120276.407	5	0.3593120	4
	1			
SellerGJudith	93713.2617	410009.14	0.2285638	0.819212
		5		1
SellerGJust	197268.002	338089.55	0.5834786	0.559582
	3	2		8
SellerGJustin	-	410715.99	-	0.428753
	325021.989	7	0.7913546	6
	5			
SellerGK.R.Peters	118631.036	306357.12	0.3872312	0.698592
	1	6		3
SellerGKaren	-	410119.12	-	0.303903
	421662.288	4	1.0281459	1
	6			
SellerGKay	504397.581	240602.20	2.0963964	0.036069
	5	1		1
SellerGKaye	29342.9112	337496.97	0.0869427	0.930718
		6		6
SellerGKeatings	72960.3499	311668.96	0.2340957	0.814914
		6		9
SellerGKelly	653850.816	280496.58	2.3310473	0.019768
	7	4		3
SellerGKen	-	410235.69	-	0.903035
	49979.4008	2	0.1218309	1
SellerGL	159825.952	336267.51	0.4752941	0.634586
	2	8		5
SellerGLandfield	-	409876.73	-	0.883868
	59870.7058	2	0.1460700	7
SellerGLangwell	-	335019.09	-	0.453596
	251083.155	8	0.7494592	0
	3			
SellerGLE	-	281569.69	-	0.907935
	32562.4028	1	0.1156460	2

SellerGLeading	71842.5043	291407.78	0.2465360	0.805271
		2		8
SellerGLEeburn	259357.319	263766.96	0.9832820	0.325489
	2	7		6
SellerGLeyton	-	275612.58	-	0.924938
	25967.5050	3	0.0942174	1
SellerGLindellas	1586.1551	248714.81	0.0063774	0.994911
		4		7
SellerGLITTLE	-	247433.70	-	0.568618
	141062.885	1	0.5701038	6
	2			
SellerGLJ	-	241511.56	-	0.786042
	65560.6542	0	0.2714597	4
SellerGLJH	-	280287.44	-	0.699323
	108259.212	1	0.3862435	6
	2			
SellerGLLC	-	290397.57	-	0.951248
	17755.1973	1	0.0611410	0
SellerGLove	-	239128.10	-	0.940475
	17856.6138	8	0.0746738	5
SellerGLuxe	-	410263.01	-	0.304250
	421507.602	8	1.0274082	2
	1			
SellerGM.J	-	273983.57	-	0.942843
	19644.2216	5	0.0716985	1
SellerGMaddison	-	410302.67	-	0.893400
	54982.6358	2	0.1340051	9
SellerGMaitland	-	335229.50	-	0.606881
	172490.614	7	0.5145448	1
	7			
SellerGMandy	121624.011	410237.42	0.2964722	0.766874
	9	7		9
SellerGMarshall	376144.263	237654.52	1.5827356	0.113509
	9	2		6
SellerGMarvelli	74133.6222	410530.35	0.1805801	0.856700
		0		4
SellerGMason	-	263258.27	-	0.789294
	70351.1902	8	0.2672326	9
SellerGMatthew	-	290458.66	-	0.931655
	24910.7888	4	0.0857636	8

SellerGMax	-	259795.86	-	0.764111
	77962.9653	5	0.3000932	6
SellerGMcDonald	170576.676	245473.50	0.6948883	0.487139
	5	5		5
SellerGMcEwing	400405.079	411201.30	0.9737447	0.330204
	2	4		1
SellerGMcGrath	31008.6565	238023.97	0.1302753	0.896350
		6		9
SellerGMcGrath/First	-	410286.46	-	0.555074
	242147.339	6	0.5901909	4
	0			
SellerGMcGrath/Langwell	-	306461.03	-	0.753094
	96403.2156	4	0.3145692	5
SellerGMcLennan	-	261752.73	-	0.656039
	116584.477	0	0.4453993	7
	5			
SellerGMcNaughton	-	410481.68	-	0.876825
	63623.8967	8	0.1549981	5
SellerGMeadows	122332.585	410510.06	0.2980014	0.765707
	5	9		5
SellerGMega	287234.344	410381.89	0.6999196	0.483991
	8	1		8
SellerGMelbourne	135758.369	257358.46	0.5275069	0.597851
	2	6		9
SellerGMICM	-	248836.54	-	0.517892
	160901.961	5	0.6466171	9
	4			
SellerGMiles	130809.712	239278.53	0.5466839	0.584606
	9	8		7
SellerGMillership	-	249473.34	-	0.774508
	71471.4398	3	0.2864893	6
SellerGMitchell	114467.462	335405.50	0.3412808	0.732898
	7	0		5
SellerGMJ	313694.612	410482.09	0.7642102	0.444757
	2	9		9
SellerGMoonee	-	245769.44	-	0.392562
	210136.014	5	0.8550128	1
	8			
SellerGMorleys	-	335509.53	-	0.646616
	153824.604	1	0.4584806	0
	5			

SellerGMorrison	65840.8336	241331.34	0.2728234	0.784994
		7		0
SellerGMunn	-	307330.97	-	0.389966
	264215.823	7	0.8597110	5
	9			
SellerGNardella	-	335035.16	-	0.448241
	254082.593	4	0.7583759	7
	8			
SellerGNelson	30249.4254	237190.91	0.1275320	0.898521
		9		6
SellerGNexus	-	410282.89	-	0.884700
	59497.7919	5	0.1450165	4
SellerGNguyen	11056.2731	280730.92	0.0393839	0.968585
		2		0
SellerGNicholas	800405.079	411201.30	1.9465042	0.051618
	2	4		8
SellerGNicholls	-	412827.60	-	0.744857
	134349.049	1	0.3254362	0
	0			
SellerGNicholson	-	305780.71	-	0.501203
	205673.757	3	0.6726185	7
	0			
SellerGNick	350369.517	249490.80	1.4043384	0.160245
	0	9		5
SellerGNoel	35219.2803	238204.42	0.1478532	0.882461
		8		3
SellerGO'Brien	-	239372.68	-	0.695504
	93691.9566	0	0.3914062	3
SellerGO'Donoghues	-	335224.53	-	0.723477
	118610.364	8	0.3538236	6
	6			
SellerGO'Brien	43707.9394	265058.06	0.1648995	0.869026
		1		0
SellerGO'Brien	22981.0181	256012.50	0.0897652	0.928475
		8		4
SellerGOne	170150.477	281362.58	0.6047374	0.545365
	8	9		6
SellerGP	-	410511.63	-	0.812734
	97252.6688	0	0.2369060	0
SellerGPagan	7077.4559	253431.67	0.0279265	0.977721
		7		3

SellerGParkes	145066.148 8	259339.65 0	0.5593674	0.575922 0
SellerGPaul	- 74535.8785	274038.34 6	- 0.2719907	0.785634 1
SellerGPeake	143943.291 3	297563.21 7	0.4837402	0.628579 6
SellerGPeninsula	- 148149.694 7	410476.35 9	- 0.3609214	0.718164 9
SellerGPeople	253794.845 9	306033.68 5	0.8293036	0.406950 1
SellerGPeter	- 104802.027 0	249048.59 4	- 0.4208096	0.673902 1
SellerGPhilip	- 31947.4079	240764.84 9	- 0.1326913	0.894439 9
SellerGPoint	- 20332.1850	262796.57 0	- 0.0773685	0.938331 7
SellerGPRDNationwide	-3368.0059	255336.51 7	- 0.0131905	0.989476 1
SellerGPride	48370.1507	273919.54 9	0.1765852	0.859837 3
SellerGProf	- 344499.230 6	409868.38 2	- 0.8405118	0.400639 2
SellerGProf.	- 21115.8091	243470.14 2	- 0.0867285	0.930888 8
SellerGProfessionals	- 60676.8290	259354.98 9	- 0.2339528	0.815025 8
SellerGProperty	68481.3181	306114.23 9	0.2237116	0.822985 7
SellerGPurplebricks	- 57125.6917	243537.42 1	- 0.2345664	0.814549 5
SellerGR&H	- 193976.363 4	306183.06 2	- 0.6335307	0.526399 9
SellerGRaine	- 34703.5764	238885.19 7	- 0.1452730	0.884497 9
SellerGRaine&Horne	- 203750.326 7	335833.41 7	- 0.6067006	0.544061 8

SellerGRay	-	237097.84	-	0.791747
	62605.1718	5	0.2640478	9
SellerGRe	-	268543.73	-	0.546577
	161908.951	7	0.6029146	5
	6			
SellerGRE	66573.7607	264759.06	0.2514504	0.801470
		4		5
SellerGReal	292058.820	290141.52	1.0066081	0.314144
	5	7		6
SellerGRealty	772824.653	410416.96	1.8830232	0.059722
	1	7		8
SellerGRed	-	409859.06	-	0.918364
	42009.0408	0	0.1024963	6
SellerGRedina	-	410570.72	-	0.850227
	77529.3250	7	0.1888331	0
SellerGReliance	-	256508.37	-	0.896518
	33362.4480	1	0.1300638	3
SellerGREMAX	-	338362.96	-	0.886734
	48196.7641	4	0.1424410	2
SellerGRenderina	35345.6912	243663.47	0.1450595	0.884666
		5		5
SellerGRexhepi	72348.9761	412872.01	0.1752334	0.860899
		2		3
SellerGRistic	13531.7441	334788.36	0.0404188	0.967760
		2		0
SellerGRodney	-	280592.70	-	0.377677
	247544.143	6	0.8822187	2
	4			
SellerGRoger	-	335275.06	-	0.276384
	364956.497	8	1.0885286	9
	1			
SellerGRosin	-	410416.81	-	0.528944
	258414.079	7	0.6296381	0
	3			
SellerGRoss	-	335231.55	-	0.196759
	432755.843	3	1.2909162	0
	0			
SellerGRounds	-	410510.06	-	0.329073
	400667.414	9	0.9760234	7
	5			

SellerGRT	133040.444 3	239232.64 5	0.5561133	0.578144 4
SellerGRW	- 43070.5015	238974.65 7	- 0.1802304	0.856974 9
SellerGRyder	58199.8443	307979.61 2	0.1889730	0.850117 3
SellerGS&L	137296.831 3	253427.24 2	0.5417604	0.587994 2
SellerGSanctuary	- 104178.149 7	410511.98 8	- 0.2537761	0.799673 1
SellerGSchroeder	- 50413.9283	251322.38 4	- 0.2005947	0.841019 1
SellerGScott	67560.0808	290228.98 0	0.2327820	0.815934 9
SellerGSell	- 351975.404 9	289942.43 3	- 1.2139493	0.224792 4
SellerGShape	- 290967.406 7	306399.55 9	- 0.9496339	0.342318 5
SellerGShine	- 334497.791 9	410282.89 5	- 0.8152857	0.414925 9
SellerGSkad	7373.8393	268668.66 7	0.0274458	0.978104 6
SellerGSmart	- 343043.399 3	334929.15 2	- 1.0242268	0.305750 0
SellerGSotheby's	127693.221 6	305881.55 7	0.4174597	0.676350 1
SellerGSpace	- 50296.4240	410152.13 2	- 0.1226287	0.902403 3
SellerGSpencer	- 102921.318 2	410044.43 0	- 0.2510004	0.801818 3
SellerGSteller	- 32085.6113	335234.65 9	- 0.0957109	0.923751 9
SellerGStockdale	- 75605.2663	238381.03 5	- 0.3171614	0.751127 0



SellerGSurreal	165566.809 2	335781.35 1	0.4930792	0.621966 1
SellerGSweeney	36817.6464	238963.06 2	0.1540725	0.877555 3
SellerGSweeney/Advantage	- 74351.8560	335476.78 5	- 0.2216304	0.824605 6
SellerGThe	207431.364 8	268520.06 0	0.7724986	0.439835 3
SellerGThomas	- 42843.0508	268704.79 3	- 0.1594428	0.873322 8
SellerGThomson	- 124016.765 3	243080.69 3	- 0.5101876	0.609929 9
SellerGTim	-5434.2511	259687.36 0	- 0.0209261	0.983305 0
SellerGTrimson	94401.5052	265181.28 2	0.3559886	0.721855 7
SellerGTriwest	39869.4121	256789.42 7	0.1552611	0.876618 2
SellerGTRUE	- 105216.934 6	411805.08 7	- 0.2555018	0.798340 2
SellerGU	- 66626.3475	281504.90 0	- 0.2366792	0.812910 0
SellerGUFIRST	- 167150.465 2	411151.78 6	- 0.4065420	0.684352 1
SellerGUnited	- 23623.8967	410481.68 8	- 0.0575516	0.954106 8
SellerGUpside	141424.378 2	335021.03 3	0.4221358	0.672933 9
SellerGVeitch	- 172704.718 2	411190.34 1	- 0.4200116	0.674484 9
SellerGVICPROP	23755.0724	334696.05 6	0.0709751	0.943418 9
SellerGVillage	111478.207 6	241616.64 4	0.4613846	0.644531 5
SellerGvoglwalpole	- 126418.990 2	410588.44 6	- 0.3078971	0.758166 3

SellerGW.B.	-	280655.85	-	0.405231
	233602.802	6	0.8323461	1
	2			
SellerGWalsh	224987.433	335018.70	0.6715668	0.501873
	4	0		2
SellerGWalshe	-	249057.98	-	0.696876
	97020.6798	8	0.3895506	2
SellerGWeast	466065.021	335019.92	1.3911561	0.164205
	5	7		4
SellerGWeda	110571.617	410305.56	0.2694860	0.787560
	2	8		6
SellerGWeston	270233.163	410201.82	0.6587810	0.510049
	5	4		8
SellerGWestside	18637.6452	305973.49	0.0609126	0.951429
		5		9
SellerGWhiting	30628.3428	262286.22	0.1167745	0.907040
		2		8
SellerGWilliam	-	265469.38	-	0.787536
	71548.5724	0	0.2695172	6
SellerGWilliams	123616.730	242168.90	0.5104567	0.609741
	3	1		5
SellerGWilson	-	254981.67	-	0.801712
	64035.3133	4	0.2511369	8
SellerGWin	-	252697.37	-	0.517262
	163644.529	8	0.6475909	7
	5			
SellerGWoodards	-	237998.39	-	0.917859
	24545.2928	5	0.1031322	9
SellerGWoodards/hockingstuart	-	410235.75	-	0.558013
	240321.089	6	0.5858121	4
	4			
SellerGWyndham	73301.5841	410484.98	0.1785731	0.858276
		9		1
SellerGYPA	-	238003.31	-	0.812572
	56434.0192	4	0.2371144	3
SellerGZed	-	410161.61	-	0.472667
	294565.624	7	0.7181696	5
	6			
CouncilAreaBayside City Council	673070.473	31865.048	21.122531	0.000000
	9		3	0

CouncilAreaBoroondara City Council	592229.7008	29882.211	19.8188044	0.0000000
CouncilAreaBrimbank City Council	-142103.8990	41183.905	-3.4504717	0.0005616
CouncilAreaCardinia Shire Council	416856.4057	116745.869	3.5706309	0.0003576
CouncilAreaCasey City Council	309035.5435	61360.884	5.0363606	0.0000005
CouncilAreaDarebin City Council	162991.9402	23732.754	6.8678056	0.0000000
CouncilAreaFrankston City Council	512589.8835	52540.845	9.7560266	0.0000000
CouncilAreaGlen Eira City Council	417183.9069	31365.705	13.3006387	0.0000000
CouncilAreaGreater Dandenong City Council	208951.3426	48581.749	4.3010255	0.0000171
CouncilAreaHobsons Bay City Council	49980.8159	48119.781	1.0386750	0.2989780
CouncilAreaHume City Council	-53732.1224	26890.842	-1.9981569	0.0457235
CouncilAreaKingston City Council	441027.4514	37241.868	11.8422485	0.0000000
CouncilAreaKnox City Council	95975.0746	33509.525	2.8641133	0.0041895
CouncilAreaMacedon Ranges Shire Council	434907.6932	100229.434	4.3391215	0.0000144
CouncilAreaManningham City Council	197345.3606	25912.709	7.6157751	0.0000000
CouncilAreaMaribyrnong City Council	-28842.4840	46151.687	-0.6249497	0.5320166
CouncilAreaMaroondah City Council	125591.6700	32837.457	3.8246466	0.0001317
CouncilAreaMelbourne City Council	329645.4989	28716.608	11.4792631	0.0000000
CouncilAreaMelton City Council	-152374.1715	53326.259	-2.8573947	0.0042791
CouncilAreaMitchell Shire Council	157075.6149	129464.767	1.2132692	0.2250522

CouncilAreaMonash City Council	352556.639 1	25557.303	13.794751 3	0.000000 0
CouncilAreaMoonee Valley City Council	194089.457 6	43039.172	4.5096002	0.000006 6
CouncilAreaMoorabool Shire Council	179960.489 9	249862.34 4	0.7202385	0.471393 0
CouncilAreaMoreland City Council	106468.577 2	25820.598	4.1233971	0.000037 6
CouncilAreaNillumbik Shire Council	- 102829.982 5	85805.617	- 1.1984062	0.230784 0
CouncilAreaPort Phillip City Council	386165.400 2	35037.195	11.021584 2	0.000000 0
CouncilAreaStonnington City Council	590986.962 0	34368.300	17.195699 4	0.000000 0
CouncilAreaWhitehorse City Council	197038.716 7	28603.360	6.8886564	0.000000 0
CouncilAreaWhittlesea City Council	-2197.0535	27840.885	- 0.0789146	0.937101 9
CouncilAreaWyndham City Council	- 185338.437 3	44838.946	- 4.1334254	0.000036 0
CouncilAreaYarra City Council	306350.394 7	31459.585	9.7379032	0.000000 0
CouncilAreaYarra Ranges Shire Council	196143.493 7	85917.235	2.2829353	0.022452 6

## Test data performance metric test

```
# Compute R^2 from true and predicted values
eval_results <- function(true, predicted, df) {
  SSE <- sum((predicted - true)^2)
  SST <- sum((true - mean(true))^2)
  R_square <- 1 - SSE / SST
  RMSE = sqrt(SSE/nrow(df))

  # Model performance metrics
  data.frame(
    RMSE = RMSE,
    Rsquare = R_square
  )
}
# Prediction and evaluation on train data
```

```

predictions_test1 <- predict(Ful.Model1)
eval_results(test$Price, predictions_test1, test1)

##      RMSE    Rsquare
## 1 329613 0.6343633

```

Comparing the two models before and after transformation, the models yielded the same parametrics. Both RMSE and R Squares were equal. ## Part C

```

library(dplyr)
Project2<-Project1[c("X","Rooms","Type","Price", "Date","Postcode", "Property
count","Distance")]
sample2 = sample.split(Project2$Price, SplitRatio = .80)
training2 = subset(Project2, sample2 == TRUE)
test2 = subset(Project2, sample2 == FALSE)

```

## knn classification

```

library(class)
training.labels<-training2[,3]
test.labels<-test2[,3]

```

## Model

To build a model, the below procedure was used:

```

NROW(training.labels)

## [1] 39052

```

There were 39052 rows in the train dataset. To know how many K would be used, a squareroot was used. The squareroot of 36746=197.61. There were therefore two models to be built. The one with k=197 and k=198.

```

test2<-na.omit(test2)
training2<-na.omit(training2)
knn.191<-knn(train=training2[, -3],test=test2[, -3],cl=training.labels,k=197)
knn.192<-knn(train=training2[, -3],test=test2[, -3],cl=training.labels,k=198)

```

## Model knn.191 evaluation done using confusion matrix

```

confusionMatrix(knn.191,test.labels)

```

```

## Confusion Matrix and Statistics
##
##              Reference
## Prediction    h    t    u
##      h 6308  737  525
##      t    0    0    0
##      u  333  181 1297
##
## Overall Statistics
##

```

```

##              Accuracy : 0.8107
##              95% CI : (0.8026, 0.8186)
##      No Information Rate : 0.7079
##      P-Value [Acc > NIR] : < 2.2e-16
##
##              Kappa : 0.5161
##
##  McNemar's Test P-Value : < 2.2e-16
##
## Statistics by Class:
##
##              Class: h Class: t Class: u
## Sensitivity          0.9499  0.00000  0.7119
## Specificity          0.5394  1.00000  0.9320
## Pos Pred Value       0.8333      NaN  0.7162
## Neg Pred Value       0.8161  0.90214  0.9306
## Prevalence           0.7079  0.09786  0.1942
## Detection Rate       0.6724  0.00000  0.1383
## Detection Prevalence 0.8070  0.00000  0.1930
## Balanced Accuracy    0.7446  0.50000  0.8219

```

The model was accurately predicted with an accuracy of up to 81.26% and between 80.46% and 82.05% at an 95% confidence interval. ## Model knn.192 evaluation done using confusion matrix

```

confusionMatrix(knn.192,test.labels)

## Confusion Matrix and Statistics
##
##              Reference
## Prediction    h    t    u
##              h 6310  738  527
##              t   0    0    0
##              u  331  180 1295
##
## Overall Statistics
##
##              Accuracy : 0.8107
##              95% CI : (0.8026, 0.8186)
##      No Information Rate : 0.7079
##      P-Value [Acc > NIR] : < 2.2e-16
##
##              Kappa : 0.5158
##
##  McNemar's Test P-Value : < 2.2e-16
##
## Statistics by Class:
##
##              Class: h Class: t Class: u
## Sensitivity          0.9502  0.00000  0.7108

```

## Specificity	0.5383	1.00000	0.9324
## Pos Pred Value	0.8330	NaN	0.7171
## Neg Pred Value	0.8167	0.90214	0.9304
## Prevalence	0.7079	0.09786	0.1942
## Detection Rate	0.6726	0.00000	0.1380
## Detection Prevalence	0.8075	0.00000	0.1925
## Balanced Accuracy	0.7442	0.50000	0.8216

The model was accurately predicted with an accuracy of up to 81.26% and between 80.46% and 82.05% at an 95% confidence interval.

## C5.0 Classification

```
library(C50)
tree_mod<-C5.0(x=training2[, -3],y=training2$Type)
summary(tree_mod)

##
## Call:
## C5.0.default(x = training2[, -3], y = training2$Type)
##
##
## C5.0 [Release 2.07 GPL Edition]      Mon Jan 18 06:23:14 2021
## -----
##
## Class specified by attribute `outcome'
##
## Read 39052 cases (8 attributes) from undefined.data
##
## Decision tree:
##
## Rooms <= -1.134389:
## : ...Price > -0.2938476:
## : : ...Distance <= -1.497048: u (26/2)
## : : : Distance > -1.497048:
## : : : ...Postcode <= -0.224721:
## : : : : ...Distance > -1.271884: h (891/59)
## : : : : : Distance <= -1.271884:
## : : : : : ...Price <= -0.1944372:
## : : : : : : ...Rooms <= -2.192917: u (3)
## : : : : : : : Rooms > -2.192917:
## : : : : : : : ...Price > -0.2365602: u (8/2)
## : : : : : : : : Price <= -0.2365602:
## : : : : : : : : ...Distance > -1.364599: t (5/2)
## : : : : : : : : : Distance <= -1.364599:
## : : : : : : : : : ...Propertycount <= -0.2966748:
## : : : : : : : : : : ...X <= -0.687992: u (2)
## : : : : : : : : : : : X > -0.687992: h (4/1)
## : : : : : : : : : : : : Propertycount > -0.2966748:
## : : : : : : : : : : : : ...Date <= 0.07262596: t (2/1)
## : : : : : : : : : : : : : Date > 0.07262596: h (3)
```

```

## : : : Price > -0.1944372:
## : : : :...Postcode > -0.4557323: h (27/1)
## : : : Postcode <= -0.4557323:
## : : : :...Price > 1.221741: h (10)
## : : : Price <= 1.221741:
## : : : :...Price > 0.8249413: u (4)
## : : : Price <= 0.8249413:
## : : : :...X > 0.5757126: h (31/8)
## : : : X <= 0.5757126:
## : : : :...Propertycount > -0.1730603: h (12/
5)
## : : : Propertycount <= -0.1730603:
## : : : :...Propertycount <= -0.9400983:
## : : : :...Price <= 0.1703487: u (4/1
)
## : : : : Price > 0.1703487: h (2)
## : : : Propertycount > -0.9400983:
## : : : :...Date > 0.4557492: h (18/1)
## : : : Date <= 0.4557492:
## : : : :...Date <= -0.5294248: h
(19/3)
## : : : Date > -0.5294248:
## : : : :...Date <= -0.4473269
: t (3)
## : : : Date > -0.4473269:
## : : : :...X <= -0.260114
5: u (6/2)
## : : : X > -0.2601145
: t (9/4)
## : : Postcode > -0.224721:
## : : :...Price > -0.00825316:
## : : :...Postcode > 0.659495:
## : : : :...Price <= 1.479534: h (65/22)
## : : : : Price > 1.479534: u (4)
## : : : Postcode <= 0.659495:
## : : : :...Price <= 0.1728761:
## : : : :...Distance <= -1.364599: h (43/11)
## : : : : Distance > -1.364599:
## : : : :...Propertycount <= 0.2769773: h (93/26)
## : : : : Propertycount > 0.2769773:
## : : : :...Price <= 0.06335607:
## : : : :...Price <= 0.005226224: h (6/1)
## : : : : Price > 0.005226224:
## : : : : :...Distance <= -0.07983551: u (13
)
## : : : : Distance > -0.07983551: h (3/1
)
## : : : : Price > 0.06335607:
## : : : :...Price > 0.1358078: u (12/5)
## : : : : Price <= 0.1358078:

```



```

## : : : : : ...Date <= -1.022012: h (3)
## : : : : : Date > -1.022012: t (13/5)
## : : : : : Price > 0.1728761:
## : : : : : ...Postcode > 0.5001768: h (150/16)
## : : : : : Postcode <= 0.5001768:
## : : : : : ...Postcode <= 0.1178132: h (199/18)
## : : : : : Postcode > 0.1178132:
## : : : : : ...Distance > -1.112944:
## : : : : : ...Price <= 1.739012: h (235/33)
## : : : : : : Price > 1.739012:
## : : : : : : ...Postcode <= 0.1656086: u (7/1)
## : : : : : : Postcode > 0.1656086: h (6)
## : : : : : Distance <= -1.112944:
## : : : : : ...Postcode <= 0.1417109:
## : : : : : ...Price > 0.7449074: h (14/1)
## : : : : : : Price <= 0.7449074:
## : : : : : : ...Price <= 0.3691696: h (7/1
)
## : : : : : : Price > 0.3691696: u (19/4
)
## : : : : : Postcode > 0.1417109:
## : : : : : ...Date > 1.249362: h (3)
## : : : : : Date <= 1.249362:
## : : : : : ...X <= 0.1237896: u (7/1)
## : : : : : X > 0.1237896:
## : : : : : ...X <= 1.066559: t (4/1)
## : : : : : X > 1.066559: u (3/1)
## : : : Price <= -0.00825316:
## : : : ...Distance > 0.6221485:
## : : : ...Postcode <= 0.4603473: h (13)
## : : : : Postcode > 0.4603473:
## : : : : ...Date <= -0.09156969:
## : : : : ...X <= 1.191123: h (10/1)
## : : : : : X > 1.191123: t (2/1)
## : : : : Date > -0.09156969:
## : : : : ...Postcode > 0.5639041:
## : : : : ...Price <= -0.1986495: t (3/1)
## : : : : : Price > -0.1986495: h (9)
## : : : : Postcode <= 0.5639041:
## : : : : ...Date <= 1.030434: t (8)
## : : : : Date > 1.030434:
## : : : : ...Price <= -0.2256082: t (2)
## : : : : : Price > -0.2256082: h (4)
## : : : Distance <= 0.6221485:
## : : : ...Propertycount <= -0.6643775:
## : : : ...X <= -1.219079: u (8)
## : : : : X > -1.219079: h (64/21)
## : : : Propertycount > -0.6643775:
## : : : ...Distance <= -1.364599:
## : : : : ...Rooms <= -2.192917: h (4)

```

```

## : : : Rooms > -2.192917:
## : : : ....Postcode > 0.3169609:
## : : : ....Price <= -0.1860125: u (4)
## : : : : Price > -0.1860125: h (5)
## : : : Postcode <= 0.3169609:
## : : : ....X > 0.4732723:
## : : : ....X <= 1.563883: h (7/1)
## : : : : X > 1.563883: u (2)
## : : : X <= 0.4732723:
## : : : ....X <= -1.520141: u (4/1)
## : : : : X > -1.520141:
## : : : ....Date <= 1.030434:
## : : : ....X <= 0.07229493: h (16
/7)
## : : : : X > 0.07229493: t (3)
## : : : : Date > 1.030434:
## : : : ....Price <= -0.1935947: u
(3/1)
## : : : : Price > -0.1935947: h
(2)
## : : : Distance > -1.364599:
## : : : ....Distance <= -0.6361247:
## : : : ....Postcode > 0.3169609: u (63/21)
## : : : : Postcode <= 0.3169609:
## : : : ....Postcode <= -0.1689596:
## : : : : ....Date <= -1.377769: u (4)
## : : : : : Date > -1.377769:
## : : : : : ....Date <= -0.09156969:
## : : : : : : ....Price <= -0.2154987: t
(2)
## : : : : : : : Price > -0.2154987: h
(4/1)
## : : : : : : : Date > -0.09156969:
## : : : : : : : ....Date <= 0.3462854: u (
4)
## : : : : : : : Date > 0.3462854: t (4
/1)
## : : : : : : : Postcode > -0.1689596:
## : : : : : : : ....Price <= -0.07562649:
## : : : : : : : ....Distance <= -0.7818195: u
(57/4)
## : : : : : : : : Distance > -0.7818195:
## : : : : : : : : ....Date <= -1.268305: h (
4/1)
## : : : : : : : : Date > -1.268305: u (2
4/4)
## : : : : : : : : Price > -0.07562649:
## : : : : : : : : ....Postcode <= 0.0700177: u (
7)
## : : : : : : : : : Postcode > 0.0700177:

```

```

## : : : : ...Date <= -0.3104972: u
(3)
## : : : : Date > -0.3104972: t (
10/3)
## : : Distance > -0.6361247:
## : : :...Date <= 0.04526002:
## : : :...Propertycount > 0.1600931: u (22/3
)
## : : : Propertycount <= 0.1600931:
## : : : :...Date <= -1.377769: h (6)
## : : : : Date > -1.377769: u (40/19)
## : : Date > 0.04526002:
## : : :...Propertycount > 0.9778333: u (6/1)
## : : Propertycount <= 0.9778333:
## : : :...Price > -0.055431:
## : : :...Postcode <= 0.5240746: u (
6/1)
## : : : : Postcode > 0.5240746: h (2
)
## : : Price <= -0.055431:
## : : :...Price > -0.08744454:
## : : :...Propertycount <= -0.31
50711: t (11/1)
## : : : : Propertycount > -0.315
0711: h (6)
## : : Price <= -0.08744454:
## : : :...Postcode <= 0.1098473:
h (6/3)
## : : : : Postcode > 0.1098473:
## : : :...Price <= -0.214656
2: [S1]
## : : : : Price > -0.2146562
:
## : : :...Price <= -0.20
20193: h (3)
## : : : : Price > -0.202
0193: [S2]
## : : Price <= -0.2938476:
## : : :...Rooms <= -2.192917:
## : : :...Distance > -0.1328154:
## : : : :...Postcode <= -0.4398005: h (9)
## : : : : : Postcode > -0.4398005:
## : : : : : :...Postcode > 0.6674609: h (4)
## : : : : : : Postcode <= 0.6674609:
## : : : : : :...Price <= -0.9299061: u (77/8)
## : : : : : : Price > -0.9299061:
## : : : : : :...Price > -0.6586335: h (3)
## : : : : : : Price <= -0.6586335:
## : : : : : :...Postcode <= -0.2326869: t (6)
## : : : : : : Postcode > -0.2326869: u (11/2)

```

```

## :      : Distance <= -0.1328154:
## :      : :...Price <= -0.7209756: u (1094/30)
## :      : Price > -0.7209756:
## :      : :...Price > -0.3831485:
## :      : :...X <= 0.1543679: t (2/1)
## :      : : X > 0.1543679: h (4)
## :      : Price <= -0.3831485:
## :      : :...Postcode > -0.2326869: u (39)
## :      : Postcode <= -0.2326869:
## :      : :...Distance <= -1.364599: u (21/1)
## :      : Distance > -1.364599:
## :      : :...Distance > -0.9672492: h (4)
## :      : Distance <= -0.9672492:
## :      : :...Propertycount <= -0.6643775: h (2/1)
## :      : Propertycount > -0.6643775: t (5)
## : Rooms > -2.192917:
## : :...Postcode > -0.2645505:
## :      :...Postcode > 0.6674609:
## :      : :...Price <= -1.00657: u (34/16)
## :      : : Price > -1.00657: h (17/3)
## :      : Postcode <= 0.6674609:
## :      : :...Distance <= -0.6493697: u (1224/57)
## :      : Distance > -0.6493697:
## :      : :...Price > -0.548271:
## :      : :...Distance <= 0.3440039:
## :      : : :...Distance > 0.277779: u (14)
## :      : : : Distance <= 0.277779:
## :      : : : :...Distance <= -0.2255303:
## :      : : : :...Propertycount > -1.163771: u (184/
45)
## :      : : : : Propertycount <= -1.163771:
## :      : : : : :...Propertycount <= -1.36658: h (
4)
## :      : : : : : Propertycount > -1.36658: u (1
3/2)
## :      : : : : Distance > -0.2255303:
## :      : : : : :...Propertycount > -0.4806383: u (96/
22)
## :      : : : : Propertycount <= -0.4806383:
## :      : : : : :...Postcode <= -0.05743685: t (4)
## :      : : : : Postcode > -0.05743685:
## :      : : : : :...Date <= -0.03683781:
## :      : : : : :...Postcode <= 0.1257791:
u (4/1)
## :      : : : : : Postcode > 0.1257791:
[S3]
## :      : : : : Date > -0.03683781:
## :      : : : : :...Price > -0.3039572: t
(2)
## :      : : : : Price <= -0.3039572:

```

```

## : : : : ...Postcode > 0.51610
86: u (12/1)
## : : : : Postcode <= 0.5161
086:
## : : : : ...Date <= 0.9757
02: u (13/3)
## : : : : Date > 0.97570
2: h (6/1)
## : : : Distance > 0.3440039:
## : : : :...Postcode > 0.4683132:
## : : : :...Propertycount <= -0.4158024:
## : : : : :...Postcode <= 0.579836: u (69/19)
## : : : : : Postcode > 0.579836: h (2)
## : : : : Propertycount > -0.4158024:
## : : : : :...Distance > 1.986381: h (2)
## : : : : : Distance <= 1.986381:
## : : : : :...X <= -1.35336: t (6)
## : : : : : X > -1.35336:
## : : : : :...Date <= -1.213573:
## : : : : :...X <= 0.6760668: h (3)
## : : : : : : X > 0.6760668: t (4)
## : : : : : Date > -1.213573:
## : : : : :...Postcode <= 0.5559382:
## : : : : :...X <= 0.4091511: u
(8/1)
## : : : : : X > 0.4091511: t (
7/2)
## : : : : Postcode > 0.5559382:
## : : : : :...Price > -0.5314218
: u (12/2)
## : : : : Price <= -0.531421
8:
## : : : : :...Price <= -0.53
98464: t (2/1)
## : : : : Price > -0.539
8464: h (6/1)
## : : : Postcode <= 0.4683132:
## : : : :...Propertycount > 1.301116: u (7)
## : : : : Propertycount <= 1.301116:
## : : : :...Propertycount > -0.1293129: h (16/
1)
## : : : : Propertycount <= -0.1293129:
## : : : :...Propertycount <= -0.8611286: h
(7)
## : : : : Propertycount > -0.8611286:
## : : : :...X <= -0.2570401: u (23/6)
## : : : : X > -0.2570401:
## : : : :...Date > 0.975702: h (7)
## : : : : Date <= 0.975702:
## : : : :...Price <= -0.455600

```

```

2:
## : : : ...Date <= -0.529
4248: t (3/1)
## : : : Date > -0.5294
248: u (11/3)
## : : : Price > -0.4556002
:
## : : : ...Date <= 0.7294
086: h (9/1)
## : : : Date > 0.72940
86: [S4]
## : : Price <= -0.548271:
## : : ...Distance <= 0.251289: u (455/29)
## : : Distance > 0.251289:
## : : ...Postcode > 0.5878018:
## : : ...Price <= -0.9770839: u (23/2)
## : : : Price > -0.9770839: h (31/13)
## : : Postcode <= 0.5878018:
## : : ...Postcode > 0.4922109: u (264/36)
## : : Postcode <= 0.4922109:
## : : ...Propertycount > 0.9199522:
## : : ...Distance <= 0.913538: u (5/1)
## : : : Distance > 0.913538:
## : : : ...Postcode <= 0.2452677:
## : : : ...Date > -0.2557653: u (
7/2)
## : : : : Date <= -0.2557653:
## : : : : ...X <= -0.3627743: h
(2)
## : : : : X > -0.3627743: t
(3/1)
## : : : Postcode > 0.2452677:
## : : : ...Price <= -0.8919953: u
(12/2)
## : : : Price > -0.8919953:
## : : : ...Price <= -0.725187
9: t (8/1)
## : : : Price > -0.7251879
: h (2/1)
## : : Propertycount <= 0.9199522:
## : : ...Distance <= 0.7545983: u (110/
30)
## : : Distance > 0.7545983:
## : : ...Distance > 1.694992: h (8/
2)
## : : Distance <= 1.694992:
## : : ...Date <= -0.3104972:
## : : ...Price > -0.7218181
: h (10/3)
## : : : Price <= -0.721818

```

```

1:
## : : : :...Postcode <= 0.
3886541: [S5]
## : : : Postcode > 0.3
886541: [S6]
## : : Date > -0.3104972:
## : : :...Distance > 1.46982
7: u (31/2)
## : : Distance <= 1.4698
27:
## : : :...Date <= 0.0452
6002: u (15)
## : : Date > 0.04526
002: [S7]
## : Postcode <= -0.2645505:
## : :...Postcode <= -0.9177551: u (130/3)
## : : Postcode > -0.9177551:
## : :...Price <= -0.679695:
## : :...Distance <= -0.5698998:
## : : :...Distance <= -1.205659: u (128/2)
## : : : Distance > -1.205659:
## : : :...Price <= -0.8085916: u (541/56)
## : : : Price > -0.8085916:
## : : :...Propertycount > -0.5818182:
## : : :...Propertycount <= -0.2295954: u (46
/4)
## : : : : Propertycount > -0.2295954:
## : : : :...Propertycount > -0.07008559:
## : : : :...Distance <= -0.9010243:
## : : : : :...Date <= -1.702251: h (
2)
## : : : : : Date > -1.702251: u (3
6/1)
## : : : : : Distance > -0.9010243:
## : : : : :...Date <= -1.319128: t (
6/2)
## : : : : : Date > -1.319128: u (5
0/14)
## : : : : Propertycount <= -0.07008559:
## : : : :...Price > -0.7074962: t (5)
## : : : : Price <= -0.7074962:
## : : : :...X <= -1.603092: h (2)
## : : : : X > -1.603092:
## : : : :...X > 0.6978065: t (
8/4)
## : : : : X <= 0.6978065:
## : : : :...X <= -0.760842
1: t (4/1)
## : : : : X > -0.7608421
: u (11/2)

```

```

## :      :      :      Propertycount <= -0.5818182:
## :      :      :      :...Postcode > -0.4398005: u (4)
## :      :      :      Postcode <= -0.4398005:
## :      :      :      :...Propertycount <= -1.063937: u
(6/1)
## :      :      :      Propertycount > -1.063937:
## :      :      :      :...Propertycount <= -0.713284
8:
## :      :      :      :...X <= -0.6389678: t (5)
## :      :      :      :   X > -0.6389678: h (13/
6)
## :      :      :      Propertycount > -0.7132848
:
## :      :      :      :...Price <= -0.7799479: u
(5/1)
## :      :      :      Price > -0.7799479:
## :      :      :      :...Price <= -0.747934
4: t (5)
## :      :      :      Price > -0.7479344
:
## :      :      :      :...X > -0.0413995
2: u (3)
## :      :      :      X <= -0.041399
52: [S8]
## :      :      :      Distance > -0.5698998:
## :      :      :      :...Distance > 0.9665179:
## :      :      :      :...Distance > 1.112213: h (3/1)
## :      :      :      :   Distance <= 1.112213:
## :      :      :      :   :...Date <= -1.295671: u (3/1)
## :      :      :      :   Date > -1.295671:
## :      :      :      :   :...Propertycount > 0.675864:
## :      :      :      :   :...Price <= -1.012467: t (12/1)
## :      :      :      :   :   Price > -1.012467: h (2)
## :      :      :      :   Propertycount <= 0.675864:
## :      :      :      :   :...Price <= -1.091659: h (2)
## :      :      :      :   Price > -1.091659:
## :      :      :      :   :...Price <= -1.051119: t (3/1
)
## :      :      :      :   Price > -1.051119: h (3/1)
## :      :      :      Distance <= 0.9665179:
## :      :      :      :...Postcode > -0.3203119:
## :      :      :      :...Date <= -1.815624: h (2/1)
## :      :      :      :   Date > -1.815624: u (53/8)
## :      :      :      Postcode <= -0.3203119:
## :      :      :      :...Price <= -0.8860981:
## :      :      :      :   :...Price <= -1.146419:
## :      :      :      :   :   :...Propertycount > -1.051823: u (
46/4)
## :      :      :      :   :   Propertycount <= -1.051823:
## :      :      :      :   :   :...Price <= -1.192754: u (2)

```



```
## : : : Price > -1.192754: t (2)
## : : : Price > -1.146419:
## : : : ....Distance <= 0.02612433:
## : : : ....Date > -0.09156969:
## : : : ....Propertycount > -1.197
199: u (73/5)
## : : : : Propertycount <= -1.19
7199:
## : : : : ....Date <= 0.5925789:
t (3)
## : : : : Date > 0.5925789:
u (4/1)
## : : : : Date <= -0.09156969:
## : : : : ....Propertycount > 1.7892
92: u (53/13)
## : : : : Propertycount <= 1.789
292:
## : : : : ....Date <= -0.9399139
: u (67/34)
## : : : : Date > -0.9399139:
## : : : : ....Distance <= -0
.2255303:
## : : : : ....X <= -1.39
7443: t (3/1)
## : : : : : X > -1.397
443: u (9)
## : : : : Distance > -0.
2255303: [S9]
## : : : Distance > 0.02612433:
## : : : ....Date > -0.6115226:
## : : : ....Price <= -0.9636045: u
(88/30)
## : : : : Price > -0.9636045:
## : : : : ....Date <= 0.2641875:
[S10]
## : : : : Date > 0.2641875:
[S11]
## : : : Date <= -0.6115226:
## : : : ....Postcode > -0.3840392:
h (8)
## : : : Postcode <= -0.3840392
:
## : : : ....Price <= -1.121145
: u (4)
## : : : Price > -1.121145:
[S12]
## : : Price > -0.8860981:
## : : ....Postcode <= -0.7186074:
## : : ....Postcode <= -0.838096: u (8/1)
## : : : Postcode > -0.838096:
```

```

## : : : ....Price > -0.7774205: h (33/
6)
## : : Price <= -0.7774205:
## : : ....Price > -0.794691: u (
7/1)
## : : Price <= -0.794691:
## : : ....Postcode <= -0.734
5392:
## : : : ....X <= -0.848679
5: h (8/1)
## : : : X > -0.8486795
: t (13/7)
## : : Postcode > -0.7345
392:
## : : ....Price <= -0.82
03861: u (4)
## : : Price > -0.820
3861: t (2)
## : Postcode > -0.7186074:
## : ....Date <= -0.9399139:
## : ....Postcode <= -0.6309823: u
(29/15)
## : : Postcode > -0.6309823:
## : : ....Propertycount <= 1.656
255: h (24/7)
## : : Propertycount > 1.6562
55:
## : : ....Date <= -1.022012:
t (14/6)
## : : Date > -1.022012:
u (2)
## : Date > -0.9399139:
## : ....Postcode > -0.4557323:
## : ....Price > -0.7580439: t
(48/25)
## : : Price <= -0.7580439:
## : : ....Date <= 0.3189195:
[S13]
## : : Date > 0.3189195:
## : : ....Date <= 0.8115
064: u (16)
## : : Date > 0.81150
64:
## : : : ....X > 1.3164
01: t (3)
## : : X <= 1.316
401: [S14]
## : Postcode <= -0.4557323:
## : ....Propertycount <= -1.16
3771:

```

```

## : : : ...Postcode <= -0.630
9823: u (3) : : Postcode > -0.6309
## : : Propertycount > -1.163
771: : : ...Postcode > -0.6309
## : : Postcode <= -0.630
823: t (54/16) :
## :
9823: [S15]
## : Price > -0.679695:
## : : ...Distance <= -1.139434:
## : : : ...Price <= -0.5651202: u (73/6)
## : : : Price > -0.5651202:
## : : : : ...Postcode <= -0.6548801:
## : : : : : ...Price <= -0.3578747: t (25/9)
## : : : : : Price > -0.3578747: h (3)
## : : : : Postcode > -0.6548801:
## : : : : : ...Date <= -1.561512:
## : : : : : : ...Postcode > -0.4557323: h (4)
## : : : : : : Postcode <= -0.4557323:
## : : : : : : : ...Price <= -0.3578747: t (3)
## : : : : : : : Price > -0.3578747: h (2)
## : : : : : Date > -1.561512:
## : : : : : : ...Distance <= -1.205659: u (84/26)
## : : : : : : Distance > -1.205659:
## : : : : : : : ...Price <= -0.5272095: u (4/1)
## : : : : : : : Price > -0.5272095:
## : : : : : : : : ...Price <= -0.4084224: t (6)
## : : : : : : : : Price > -0.4084224: h (4/1)
)
## : Distance > -1.139434:
## : : ...Price <= -0.4682237:
## : : : ...Postcode <= -0.7345392:
## : : : : ...Postcode <= -0.838096:
## : : : : : : ...Postcode > -0.8858914: u (46/29)
## : : : : : : : Postcode <= -0.8858914:
## : : : : : : : : ...Propertycount <= -1.063937: h
(8/2)
## : : : : : Propertycount > -1.063937:
## : : : : : : ...Date <= -0.9125479: h (10/
4)
## : : : : : : Date > -0.9125479: t (39/1
7)
## : : : : : : Postcode > -0.838096:
## : : : : : : : ...Distance > -0.397715: h (34/2)
## : : : : : : : Distance <= -0.397715:
## : : : : : : : : ...Postcode <= -0.8062324:
## : : : : : : : : : ...X <= 0.7824597: h (6)
## : : : : : : : : : X > 0.7824597: t (2)

```

```

## : : Postcode > -0.8062324:
## : : :...Price <= -0.6493664: h (2/
1)
## : : : Price > -0.6493664: t (3)
## : : Postcode > -0.7345392:
## : : :...Postcode <= -0.662846:
## : : :...Propertycount <= -0.516758:
## : : : :...Distance <= -0.5566548: t (5/2
)
## : : : : Distance > -0.5566548: h (2)
## : : : : Propertycount > -0.516758:
## : : : :...Postcode > -0.7265733: u (48/7
)
## : : : : Postcode <= -0.7265733:
## : : : : :...Price <= -0.6064008: u (3/
1)
## : : : : Price > -0.6064008:
## : : : : :...Date <= -0.5294248: u
(3/1)
## : : : : Date > -0.5294248: t (
3)
## : : : : Postcode > -0.662846:
## : : : : :...Propertycount > 1.272848:
## : : : : :...Date <= -0.9946458: h (16/3)
## : : : : : : Date > -0.9946458:
## : : : : : : :...Date <= 1.221995: t (67/27
)
## : : : : Date > 1.221995:
## : : : : :...Price <= -0.548271: u
(13/5)
## : : : : Price > -0.548271: h (
5/1)
## : : : : Propertycount <= 1.272848:
## : : : : :...Distance <= -0.5434098:
## : : : : :...Date <= -1.733526:
## : : : : : : :...X <= -1.102474: t (2)
## : : : : : : : : X > -1.102474: h (7)
## : : : : : : Date > -1.733526:
## : : : : : : :...Postcode > -0.4716642:
u (71/26)
## : : : : Postcode <= -0.4716642
:
## : : : : :...Price <= -0.615667
9: [S16]
## : : : : Price > -0.6156679
: [S17]
## : : : : Distance > -0.5434098:
## : : : : :...Postcode <= -0.3282778:
## : : : : :...Propertycount > -1.102
749: h (76/18)

```

```

## :                               : Propertycount <= -1.10
2749:
## :                               : ...Date > 0.1820897:
u (16/5)
## :                               : Date <= 0.1820897:
[S18]
## :                               : Postcode > -0.3282778:
## :                               : ...Postcode > -0.3043801:
## :                               : ...Date <= -0.3104972
: h (6/2)
## :                               : Date > -0.3104972:
u (24/10)
## :                               : Postcode <= -0.3043801
:
## :                               : ...Postcode <= -0.320
3119:
## :                               : ...Price <= -0.56
74791: u (2)
## :                               : Price > -0.567
4791: h (3/1)
## :                               : Postcode > -0.3203
119: [S19]
## : Price > -0.4682237:
## : ...Distance > -0.5698998:
## : ...Postcode <= -0.3203119: h (98/6)
## : Postcode > -0.3203119:
## : ...Price <= -0.4379085:
## : ...Date <= -0.9125479: h (2)
## : Date > -0.9125479: t (2)
## : Price > -0.4379085:
## : ...Distance <= -0.2520203: u (5/1
)
## : Distance > -0.2520203: h (8/1)
## : Distance <= -0.5698998:
## : ...Postcode <= -0.7106414:
## : ...Distance > -0.8480444: h (21)
## : Distance <= -0.8480444:
## : ...Date <= 0.1547238: h (41/4)
## : Date > 0.1547238:
## : ...X > -0.2345318: t (11/2)
## : X <= -0.2345318:
## : ...Date <= 0.7841405: h (
7)
## : Date > 0.7841405:
## : ...Date <= 1.386191:
t (4)
## : Date > 1.386191: h
(2)
## : Postcode > -0.7106414:
## : ...Propertycount > 1.272848:

```

```

## :                               :...Price > -0.3519775: h (5)
## :                               :   Price <= -0.3519775:
## :                               :   :...Date <= 0.5104811: h (10/1
)
## :                               :       Date > 0.5104811: t (8)
## :                               Propertycount <= 1.272848:
## :                               :...Postcode > -0.4716642:
## :                               :...Postcode <= -0.3920051: t
(28/12)
## :                               :   Postcode > -0.3920051:
## :                               :   :...Price <= -0.4235867: u
(4)
## :                               :       Price > -0.4235867: t
(17/9)
## :                               Postcode <= -0.4716642:
## :                               :...Postcode > -0.5274255: h (
22/5)
## :                               Postcode <= -0.5274255:
## :                               :...Propertycount > 0.1145
509:
## :                               :...Date > 0.3736513:
## :                               :   :...X <= 1.39496:
u (15/4)
## :                               :   :   X > 1.39496:
## :                               :   :   :...X <= 1.665
554: t (2)
## :                               :   :       X > 1.6655
54: u (2)
## :                               :   Date <= 0.3736513:
## :                               :   :...Postcode <= -0
.5991187: [S20]
## :                               :       Postcode > -0.
5991187:
## :                               :       :...X > 0.2664
154: t (8/2)
## :                               :       X <= 0.266
4154: [S21]
## :                               Propertycount <= 0.114
5509:
## :                               :...Price <= -0.438751
: [S22]
## :                               Price > -0.438751:
[S23]
## Rooms > -1.134389:
## :...Rooms > -0.07586051:
## :   :...Rooms > 0.9826678: h (2190/25)
## :   Rooms <= 0.9826678:
## :   :...Distance > 0.2115541: h (4536/186)
## :   Distance <= 0.2115541:
## :   :...Postcode <= 0.1815404:

```

```
## : :...Distance > -1.271884: h (3570/271)
## : : Distance <= -1.271884:
## : : :...Distance <= -1.589763: u (4)
## : : Distance > -1.589763:
## : : :...Price <= 0.2444853: u (3/1)
## : : Price > 0.2444853: h (90/4)
## : Postcode > 0.1815404:
## : :...Price <= 0.6589764:
## : : :...Distance <= 0.1718191:
## : : : :...Distance <= -0.43745: h (18/2)
## : : : : Distance > -0.43745: t (295/129)
## : : Distance > 0.1718191:
## : : :...X <= 1.570306: h (100/22)
## : : X > 1.570306:
## : : :...Postcode <= 0.3567905: u (2)
## : : Postcode > 0.3567905: t (2)
## : Price > 0.6589764:
## : :...Distance > -0.43745: h (590/67)
## : : Distance <= -0.43745:
## : : :...Distance <= -0.5963898: h (141/8)
## : : Distance > -0.5963898:
## : : :...Price > 1.161083: h (15/1)
## : : Price <= 1.161083:
## : : :...X <= 0.8235786: t (7)
## : : X > 0.8235786: h (4/1)
## Rooms <= -0.07586051:
## :...Postcode <= -0.9177551:
## : :...Propertycount > -0.4158024: u (45/2)
## : : Propertycount <= -0.4158024:
## : : :...Postcode > -0.9655505:
## : : :...Price <= 0.007753609: u (6/1)
## : : : Price > 0.007753609: h (14/6)
## : : Postcode <= -0.9655505:
## : : :...Date <= 0.6746767: h (4)
## : : Date > 0.6746767:
## : : :...Date <= 1.249362: u (3)
## : : Date > 1.249362: h (2)
## Postcode > -0.9177551:
## :...Distance > 0.6883733:
## : :...Price > -0.4294839: h (1140/168)
## : : Price <= -0.4294839:
## : : :...Propertycount > 0.9778333:
## : : :...Distance <= 3.01949:
## : : : :...Price > -0.8456599: h (311/1)
## : : : : Price <= -0.8456599:
## : : : : :...Price <= -0.8515571: h (247/17)
## : : : : Price > -0.8515571:
## : : : : :...Price <= -0.8473448: h (5)
## : : : : Price > -0.8473448: t (4)
## : : : Distance > 3.01949:
```

```
##      :      :      : ....Date <= 0.5104811: h (72/3)
##      :      :      : Date > 0.5104811:
##      :      :      : ....Date > 0.6746767: h (27/1)
##      :      :      : Date <= 0.6746767:
##      :      :      : ....Price > -0.635887: h (8)
##      :      :      : Price <= -0.635887:
##      :      :      : ....Price <= -0.7487769: h (4)
##      :      :      : Price > -0.7487769: t (10)
##      : Propertycount <= 0.9778333:
##      : ....Postcode > 0.5957677: h (601/35)
##      : Postcode <= 0.5957677:
##      : ....Postcode <= 0.4364496:
##      :      : ....Distance > 1.827442: h (122/1)
##      :      : Distance <= 1.827442:
##      :      : ....Price <= -0.9686593:
##      :      :      : ....Date > 0.3462854:
##      :      :      :      : ....Distance <= 0.9797629:
##      :      :      :      :      : ....Date <= 1.413557: u (13/1)
##      :      :      :      :      : Date > 1.413557: t (2)
##      :      :      :      :      : Distance > 0.9797629:
##      :      :      :      :      : ....X <= -0.7260366: t (2)
##      :      :      :      :      : X > -0.7260366: h (3)
##      :      :      :      : Date <= 0.3462854:
##      :      :      :      : ....Price <= -1.135467:
##      :      :      :      : ....Postcode <= -0.05743685: t
(2)
##      :      :      :      :      : Postcode > -0.05743685: u
(2)
##      :      :      :      : Price > -1.135467:
##      :      :      :      : ....X > -0.04826181: h (27/5)
##      :      :      :      : X <= -0.04826181:
##      :      :      :      : ....Date <= -1.295671: u (
9/3)
##      :      :      :      : Date > -1.295671: h (1
9/2)
##      :      :      : Price > -0.9686593:
##      :      :      : ....Postcode <= -0.3282778: h (452/31)
##      :      :      : Postcode > -0.3282778:
##      :      :      : ....Postcode > 0.4045859: h (100/6
)
##      :      :      : Postcode <= 0.4045859:
##      :      :      : ....Price > -0.7032839: h (452
/90)
##      :      :      : Price <= -0.7032839:
##      :      :      : ....Distance <= 0.8075781:
u (6/1)
##      :      :      : Distance > 0.8075781:
##      :      :      : ....Date <= -0.1463016
: h (42/12)
##      :      :      : Date > -0.1463016:
```



```

##          :          :          :...Date <= 1.4409
23: u (12/2)
##          :          :          Date > 1.44092
3: h (2)
##          :          Postcode > 0.4364496:
##          :          :...Price > -0.438751: u (6)
##          :          Price <= -0.438751:
##          :          :...Distance > 2.7281: h (49/10)
##          :          Distance <= 2.7281:
##          :          :...Price > -0.592079: h (69/23)
##          :          Price <= -0.592079:
##          :          :...Distance <= 1.628767: u (8/2)
##          :          Distance > 1.628767:
##          :          :...X > 0.8044739:
##          :          :...Price <= -0.6830648: u
(4)
##          :          : Price > -0.6830648: h
(6/1)
##          :          X <= 0.8044739:
##          :          :...Price <= -0.6308322: [
S24]
##          :          Price > -0.6308322:
##          :          :...Postcode > 0.57983
6: t (3)
##          :          Postcode <= 0.5798
36: [S25]
##          Distance <= 0.6883733:
##          :...Price > -0.03184208:
##          :...Postcode <= -0.216755:
##          : :...Distance > -1.271884: h (1868/107)
##          : : Distance <= -1.271884:
##          : : :...X <= 0.4491171:
##          : : :...Propertycount > -0.9919222: h (85/12)
##          : : : Propertycount <= -0.9919222:
##          : : : :...X <= -0.3401013: h (3/1)
##          : : : X > -0.3401013: t (2)
##          : : X > 0.4491171:
##          : : :...Price > 0.7381678: h (25/4)
##          : : Price <= 0.7381678:
##          : : :...Distance > -1.364599:
##          : : :...Date <= 0.5652129: h (5)
##          : : : Date > 0.5652129: t (4/2)
##          : : Distance <= -1.364599:
##          : : :...X <= 1.09302: u (9/1)
##          : : X > 1.09302:
##          : : :...Propertycount <= -0.7879919: u
(2)
##          : : Propertycount > -0.7879919: t
(9/3)
##          : Postcode > -0.216755:

```

```
##      : ....Price > 1.058303: h (1190/124)
##      : Price <= 1.058303:
##      : ....Distance > -0.2917552:
##      :       ....Distance <= 0.3440039:
##      :         : ....Distance <= 0.277779: h (1013/183)
##      :           : Distance > 0.277779:
##      :             : ....Price > 0.4500459: h (21/6)
##      :               : Price <= 0.4500459:
##      :                 : ....Price <= 0.3624299: t (12/2)
##      :                   : Price > 0.3624299: u (2)
##      :                     Distance > 0.3440039:
##      :                       ....Postcode > 0.5479723:
##      :                         : ....Propertycount > -0.7879919: h (46/
11)
##      :           : Propertycount <= -0.7879919:
##      :             : ....Price <= 0.1846705: h (2/1)
##      :               : Price > 0.1846705:
##      :                 : ....Price <= 0.8527425: t (9/1
)
##      :           : Price > 0.8527425: h (5/1)
##      :             Postcode <= 0.5479723:
##      :               ....Postcode > -0.0176073: h (449/41)
##      :                 Postcode <= -0.0176073:
##      :                   ....Price > 0.295033: h (18)
##      :                     Price <= 0.295033:
##      :                       ....X > -0.2783956: h (9/1)
##      :                         X <= -0.2783956:
##      :                           ....Date <= -0.5294248: h
(2)
##      :           Date > -0.5294248: t (
7)
##      : Distance <= -0.2917552:
##      :       ....Distance > -0.3050002: h (47/31)
##      :         Distance <= -0.3050002:
##      :           ....Price <= 0.470265:
##      :             ....Price <= 0.1012668:
##      :               : ....Postcode > -0.0176073:
##      :                 : ....Distance <= -0.3182452:
##      :                   : ....Postcode <= 0.659495:
u (48/22)
##      :           : Postcode > 0.659495: h
(3)
##      :           : Distance > -0.3182452:
##      :             : ....X <= -0.5758348: u (3/
1)
##      :           : X > -0.5758348: h (5)
##      :             Postcode <= -0.0176073:
##      :               ....Date <= 0.4557492:
##      :                 : ....Date > -0.3925951: t (
8/1)
```

```

##          :          :          :          : Date <= -0.3925951:
##          :          :          :          : :...Postcode <= -0.097
2664: h (6/1)
##          :          :          :          : Postcode > -0.0972
664: t (3/1)
##          :          :          :          : Date > 0.4557492:
##          :          :          :          : :...Postcode > -0.0972664:
h (5)
##          :          :          :          : Postcode <= -0.0972664
:
##          :          :          :          : :...Price <= 0.0414520
7: u (2)
##          :          :          :          : Price > 0.04145207
: h (2)
##          :          :          :          : Price > 0.1012668:
##          :          :          :          : :...Distance <= -1.364599: h (66/1
8)
##          :          :          :          : Distance > -1.364599:
##          :          :          :          : :...Distance > -0.6361247:
##          :          :          :          : :...Distance <= -0.397715:
##          :          :          :          : :...Distance <= -0.503
6749: h (29/7)
##          :          :          :          : : Distance > -0.5036
749:
##          :          :          :          : : :...X <= -1.362528
: h (4)
##          :          :          :          : : X > -1.362528:
[S26]
##          :          :          :          : Distance > -0.397715:
##          :          :          :          : :...Propertycount <= -
0.07008559: [S27]
##          :          :          :          : Propertycount > -0
.07008559:
##          :          :          :          : :...Date > 0.45574
92: h (6)
##          :          :          :          : Date <= 0.4557
492:
##          :          :          :          : :...X <= -0.42
33821: u (6/1)
##          :          :          :          : X > -0.423
3821: [S28]
##          :          :          :          : Distance <= -0.6361247:
##          :          :          :          : :...Distance <= -1.006984:
##          :          :          :          : :...Postcode > 0.30102
91: h (35/10)
##          :          :          :          : Postcode <= 0.3010
291:
##          :          :          :          : :...X <= 0.7686803
: u (10/2)
##          :          :          :          : X > 0.7686803:

```

```

h (2)
##           :           :           Distance > -1.006984:
##           :           :           :...Date > -0.9125479:
h (66/38)
##           :           :           Date <= -0.9125479
:
##           :           :           :...Date <= -1.432
501: t (8/2)
##           :           :           Date > -1.4325
01: [S29]
##           :           Price > 0.470265:
##           :           :...Propertycount <= -0.4236545: h (22
4/30)
##           :           Propertycount > -0.4236545:
##           :           :...Propertycount > 1.642345: h (6
7/9)
##           :           Propertycount <= 1.642345:
##           :           :...Distance > -1.112944:
##           :           :...Propertycount > -0.336
8327: h (331/85)
##           :           : Propertycount <= -0.33
68327:
##           :           : :...Date <= 0.3736513:
##           :           : :...X <= -0.057374
93: t (6/3)
##           :           :           : X > -0.0573749
3: h (8)
##           :           :           Date > 0.3736513:
##           :           :           :...X <= -0.463073
6: t (5/2)
##           :           :           X > -0.4630736
: u (5)
##           :           Distance <= -1.112944:
##           :           :...X <= -1.335902: h (15/
1)
##           :           X > -1.335902:
##           :           :...Distance > -1.2056
59:
##           :           :...Price <= 0.561
2508: t (5)
##           :           : Price > 0.5612
508: u (10/1)
##           :           Distance <= -1.205
659:
##           :           :...Date <= 0.3736
513: h (31/10)
##           :           Date > 0.37365
13: [S30]
##           Price <= -0.03184208:
##           :...Postcode > -0.216755:

```

```
##      ....Distance <= -0.6361247:  
##      :      ....Price <= -0.2045467:  
##      :      :      ....Distance <= -0.9804942: u (59/2)  
##      :      :      Distance > -0.9804942:  
##      :      :      ....Postcode <= 0.484245: u (36/6)  
##      :      :      Postcode > 0.484245:  
##      :      :      ....Price <= -0.3570322: u (3)  
##      :      :      Price > -0.3570322: t (5/1)  
##      :      Price > -0.2045467:  
##      :      ....Price <= -0.1514716:  
##      :      :      ....Distance <= -1.271884: h (5)  
##      :      :      Distance > -1.271884:  
##      :      :      ....Price <= -0.1818002: h (3)  
##      :      :      Price > -0.1818002: u (6/1)  
##      :      Price > -0.1514716:  
##      :      ....Date <= -0.9125479:  
##      :      :      ....Date <= -1.268305: t (7/4)  
##      :      :      Date > -1.268305:  
##      :      :      ....X <= 1.171634: h (4)  
##      :      :      X > 1.171634: t (2)  
##      :      Date > -0.9125479:  
##      :      ....Price <= -0.07986239: u (28/6)  
##      :      Price > -0.07986239:  
##      :      ....Date <= -0.1736675: u (3)  
##      :      Date > -0.1736675: h (7/2)  
##      :      Distance > -0.6361247:  
##      :      ....Price > -0.3662976:  
##      :      ....Distance <= 0.2115541:  
##      :      :      ....Price > -0.1971533:  
##      :      :      :      ....Distance > -0.2917552: h (232/107)  
##      :      :      :      Distance <= -0.2917552:  
##      :      :      :      ....Date > -0.5294248: t (33/11)  
##      :      :      :      Date <= -0.5294248:  
##      :      :      :      ....Distance <= -0.3447351: h  
(12/5)  
##      :      :      :      Distance > -0.3447351:  
##      :      :      :      ....Price <= -0.1026089: h  
(6/1)  
##      :      :      :      Price > -0.1026089: t  
(5)  
##      :      :      Price <= -0.1971533:  
##      :      :      ....Postcode > 0.1098473:  
##      :      :      ....Postcode <= 0.1974723:  
##      :      :      :      ....Postcode > 0.1895064: t (1  
3/2)  
##      :      :      :      :      Postcode <= 0.1895064:  
##      :      :      :      :      ....Date > 0.4557492: t (4  
/1)  
##      :      :      :      :      Date <= 0.4557492:  
##      :      :      :      :      ....Price <= -0.202861
```

```

8: h (6/1)
##           :           :           :           :           Price > -0.2028618
: t (2/1)
##           :           :           :           :   Postcode > 0.1974723:
##           :           :           :           :   ....Price <= -0.3384981:
##           :           :           :           :   ....X <= 0.01157737: t (8)
##           :           :           :           :   :   X > 0.01157737: u (5/1
)
##           :           :           :           :   Price > -0.3384981:
##           :           :           :           :   ....Postcode > 0.2611995:
##           :           :           :           :   ....Postcode <= 0.4125
518: h (64/35)
##           :           :           :           :           :   Postcode > 0.41255
18: u (24/13)
##           :           :           :           :           Postcode <= 0.2611995:
##           :           :           :           :   ....Date > -0.5294248:
u (16/4)
##           :           :           :           :           Date <= -0.5294248
:
##           :           :           :           :           ....Date <= -0.963
3704: h (5/1)
##           :           :           :           :           Date > -0.9633
704: t (5)
##           :           :           :           :   Postcode <= 0.1098473:
##           :           :           :           :   ....Distance <= -0.3182452:
##           :           :           :           :   ....X <= 0.2232653: u (4)
##           :           :           :           :   :   X > 0.2232653: t (2)
##           :           :           :           :   Distance > -0.3182452:
##           :           :           :           :   ....Postcode <= -0.12913: u (1
2/4)
##           :           :           :           :   Postcode > -0.12913:
##           :           :           :           :   ....Postcode <= -0.0574368
5:
##           :           :           :           :   ....X <= -1.521129: t
(2)
##           :           :           :           :   :   X > -1.521129:
##           :           :           :           :   :   ....Price <= -0.25
76218: u (10/2)
##           :           :           :           :           :   Price > -0.257
6218: h (16/3)
##           :           :           :           :           Postcode > -0.05743685
: [S31]
##           :           :   Distance > 0.2115541:
##           :           :   ....Postcode > 0.4444155:
##           :           :   ....Postcode > 0.5479723: t (15/3)
##           :           :   :   Postcode <= 0.5479723:
##           :           :   :   ....Price <= -0.2938476:
##           :           :   :   ....Price > -0.3250187: t (13/
1)
##           :           :           :           :   :   Price <= -0.3250187:

```

```

##          :          :          :          :      ....X <= -0.4484706: t (5/
1)
##          :          :          :          :      X > -0.4484706: h (4)
##          :          :          :          :      Price > -0.2938476:
##          :          :          :          :      ....Date <= 0.2915535:
##          :          :          :          :      ....Date > -0.9125479: t (
22/7)
##          :          :          :          :      Date <= -0.9125479: [S
32]
##          :          :          :          :      Date > 0.2915535:
##          :          :          :          :      ....Postcode <= 0.5320405:
##          :          :          :          :      ....Date <= 0.7567745:
h (3/1)
##          :          :          :          :      Date > 0.7567745:
##          :          :          :          :      ....Price <= -0.13
12525: t (2)
##          :          :          :          :      Price > -0.131
2525: u (2)
##          :          :          :          :      Postcode > 0.5320405:
##          :          :          :          :      ....Date <= 0.6746767:
h (14)
##          :          :          :          :      Date > 0.6746767:
##          :          :          :          :      ....Date <= 0.8936
042: t (4/1)
##          :          :          :          :      Date > 0.89360
42: h (10/2)
##          :          :          :          :      Postcode <= 0.4444155:
##          :          :          :          :      ....Propertycount <= -0.6354368: h (13
6/25)
##          :          :          :          :      Propertycount > -0.6354368:
##          :          :          :          :      ....Price <= -0.1944372:
##          :          :          :          :      ....Price <= -0.3233338: t (29
/15)
##          :          :          :          :      Price > -0.3233338: h (75/
33)
##          :          :          :          :      Price > -0.1944372:
##          :          :          :          :      ....Propertycount <= 0.839412:
##          :          :          :          :      ....Date <= -0.5567907: h
(30)
##          :          :          :          :      Date > -0.5567907:
##          :          :          :          :      ....Postcode <= 0.2930
632: [S33]
##          :          :          :          :      Postcode > 0.29306
32:
##          :          :          :          :      ....Price <= -0.11
27184: h (3/1)
##          :          :          :          :      Price > -0.112
7184: t (4)
##          :          :          :          :      Propertycount > 0.839412:
##          :          :          :          :      ....X <= 0.002079963: h (1

```

```

0/2)
##          :          :          X > 0.002079963:
##          :          :          :...Price <= -0.173375
6: h (2)
##          :          :          Price > -0.1733756
:
##          :          :          :...Date <= -1.702
251: h (2/1)
##          :          :          Date > -1.7022
51: [S34]
##          :          Price <= -0.3662976:
##          :          :...Distance > 0.6089035:
##          :          :...Price <= -0.646839: u (6)
##          :          :    Price > -0.646839:
##          :          :    :...Postcode > 0.4523814:
##          :          :    :...Date <= -1.561512: h (6/1)
##          :          :    :    Date > -1.561512: u (19/11)
##          :          :    Postcode <= 0.4523814:
##          :          :    :...Date <= -0.009471867: h (21/1)
##          :          :    Date > -0.009471867:
##          :          :    :...Price > -0.4324325: h (12/
1)
##          :          :          Price <= -0.4324325:
##          :          :          :...Date <= 1.495655: u (1
4/2)
##          :          :          Date > 1.495655: t (3)
##          :          Distance <= 0.6089035:
##          :          :...Propertycount > 0.7633588:
##          :          :...Distance <= 0.3704938: u (32/12)
##          :          :    Distance > 0.3704938:
##          :          :    :...X <= -0.03777622: u (5/1)
##          :          :    X > -0.03777622: t (7/1)
##          :          Propertycount <= 0.7633588:
##          :          :...Distance <= 0.09234923:
##          :          :...Propertycount <= -1.327095: h
(2)
##          :          :    Propertycount > -1.327095: u (
104/40)
##          :          Distance > 0.09234923:
##          :          :...Distance <= 0.277779:
##          :          :...Price <= -0.6266199: u (7/
3)
##          :          :    Price > -0.6266199:
##          :          :    :...Price <= -0.5693325: t
(3)
##          :          :          Price > -0.5693325:
##          :          :          :...Date <= -0.9125479
: h (14/6)
##          :          :          Date > -0.9125479:
##          :          :          :...Date <= -0.365

```



```

2291: u (4)
##          :          :          Date > -0.3652
291:
##          :          :          :...X <= -0.38
40749: t (7/2)
##          :          :          X > -0.384
0749: h (9/1)
##          :          Distance > 0.277779:
##          :          :...Postcode > 0.2134041:
##          :          :...Date > -1.487233: u (3
4/14)
##          :          : Date <= -1.487233:
##          :          : :...Price <= -0.383991
: h (3)
##          :          : Price > -0.383991:
t (2)
##          :          Postcode <= 0.2134041:
##          :          :...Propertycount <= -0.67
60434: t (22/11)
##          :          Propertycount > -0.676
0434: [S35]
##          Postcode <= -0.216755:
##          :...Distance <= -0.5301648:
##          :...Price <= -0.3941005:
##          : :...Price <= -0.7095181: u (70/32)
##          : : Price > -0.7095181:
##          : : :...Distance <= -0.8612894:
##          : : :...Distance <= -1.139434:
##          : : : :...Postcode <= -0.6548801: t (3)
##          : : : : Postcode > -0.6548801: u (6)
##          : : : Distance > -1.139434:
##          : : : :...Date > 0.5104811:
##          : : : :...Date <= 1.605119: t (23/2)
##          : : : : Date > 1.605119:
##          : : : : :...Price <= -0.5727023: u
(2)
##          : : : : Price > -0.5727023: t
(2)
##          : : : Date <= 0.5104811:
##          : : : :...Date <= -1.342584:
##          : : : :...Price > -0.4261141: h
(3/1)
##          : : : : Price <= -0.4261141:
##          : : : : :...Distance <= -0.967
2492: t (11/2)
##          : : : : Distance > -0.9672
492: [S36]
##          : : : Date > -1.342584:
##          : : : :...Postcode > -0.7664028:
u (27/13)

```

```

##          :      :      :      Postcode <= -0.7664028
:
##          :      :      :      :...Price <= -0.524682
:
##          :      :      :      :...Date <= -0.447
3269: t (5/1)
##          :      :      :      :   Date > -0.4473
269: u (3)
##          :      :      :      Price > -0.524682:
[S37]
##          :      :      Distance > -0.8612894:
##          :      :      :...Date > -0.4473269:
##          :      :      :...Propertycount > -0.1293129: t
(75/33)
##          :      :      :   Propertycount <= -0.1293129:
##          :      :      :   :...Postcode > -0.750471: h (2
1/6)
##          :      :      :      Postcode <= -0.750471:
##          :      :      :      :...Propertycount <= -0.70
09458: t (64/22)
##          :      :      :      Propertycount > -0.700
9458: h (17/4)
##          :      :      :      Date <= -0.4473269:
##          :      :      :...Distance <= -0.7288396:
##          :      :      :...X > 0.1709472: h (15)
##          :      :      :   X <= 0.1709472:
##          :      :      :   :...X > -0.2650553: t (8/1
)
##          :      :      :      X <= -0.2650553:
##          :      :      :      :...Price > -0.5061479
: h (13/1)
##          :      :      :      Price <= -0.506147
9:
##          :      :      :      :...Date <= -0.912
5479: h (10/3)
##          :      :      :      Date > -0.9125
479: t (4)
##          :      :      :      Distance > -0.7288396:
##          :      :      :...Distance <= -0.5963898:
##          :      :      :...X > 0.4402235: u (5/1)
##          :      :      :   X <= 0.4402235:
##          :      :      :   :...Date <= -1.561512:
t (3)
##          :      :      :      Date > -1.561512:
h (6/2)
##          :      :      :      Distance > -0.5963898:
##          :      :      :...Price <= -0.679695: t
(2)
##          :      :      :      Price > -0.679695:
##          :      :      :...X > -1.220122: h (

```

```

32/2)
##           :           :           X <= -1.220122: [S
38]
##           : Price > -0.3941005:
##           : ....Postcode <= -0.7823346:
##           : ....Price <= -0.2980599:
##           :           : ....Distance > -0.6891046: h (9)
##           :           : Distance <= -0.6891046:
##           :           : ....Date > 1.358825: h (8)
##           :           : Date <= 1.358825:
##           :           : ....Date <= -0.5567907: h (21/
4)
##           :           :           Date > -0.5567907: t (38/1
6)
##           :           : Price > -0.2980599:
##           :           : ....Distance > -0.8612894: h (141/6)
##           :           : Distance <= -0.8612894:
##           :           : ....Date <= -1.131475: h (25)
##           :           : Date > -1.131475:
##           :           : ....Postcode > -0.8779256:
##           :           : ....X > -0.1387891: h (25/
2)
##           :           :           : X <= -0.1387891: [S39]
##           :           :           Postcode <= -0.8779256:
##           :           :           ....X <= 0.700222: h (28/3
)
##           :           :           X > 0.700222:
##           :           :           ....Price <= -0.196122
1: t (2)
##           :           :           Price > -0.1961221
:
##           :           :           ....Date <= -0.036
83781: h (2)
##           :           :           Date > -0.0368
3781: [S40]
##           :           : Postcode > -0.7823346:
##           :           : ....Distance > -0.5963898:
##           :           : ....Price > -0.2618341: h (99/11)
##           :           : Price <= -0.2618341:
##           :           : ....Date <= -0.2557653: h (28/3)
##           :           : Date > -0.2557653:
##           :           : ....Postcode <= -0.5194596: t
(19/8)
##           :           :           Postcode > -0.5194596:
##           :           :           ....X > 0.1613949: h (11/2
)
##           :           :           X <= 0.1613949:
##           :           :           ....Date <= 1.030434:
t (6/1)
##           :           :           Date > 1.030434:

```

```

##          :          :          :...Price <= -0.34
18679: h (3/1)
##          :          :          Price > -0.341
8679: [S41]
##          :          Distance <= -0.5963898:
##          :          :...Distance > -0.7818195:
##          :          :...Distance <= -0.7288396:
##          :          :    :...Price <= -0.3250187: h (4/
1)
##          :          :    :    Price > -0.3250187:
##          :          :    :    :...X <= 0.1096258: t (19/
4)
##          :          :    :    X > 0.1096258: h (12/5
)
##          :          :    Distance > -0.7288396:
##          :          :    :...Propertycount <= -1.487053
:
##          :          :    :...Price <= -0.3250187: t
(3)
##          :          :    :    Price > -0.3250187: h
(7/1)
##          :          :    Propertycount > -1.487053:
##          :          :    :...Date <= -0.1463016:
##          :          :    :...Distance <= -0.636
1247:
##          :          :    :    :...Price <= -0.25
34095: u (7/3)
##          :          :    :    :    Price > -0.253
4095: t (20/10)
##          :          :    :    Distance > -0.6361
247:
##          :          :    :    :...Price <= -0.31
49092: t (3)
##          :          :    :    Price > -0.314
9092: h (9/2)
##          :          :    Date > -0.1463016:
##          :          :    :...Price > -0.1337799
:
##          :          :    :...Date <= 0.4557
492: u (2)
##          :          :    :    Date > 0.45574
92: h (6/1)
##          :          :    Price <= -0.133779
9:
##          :          :    :...Price <= -0.27
86833: [S42]
##          :          :    Price > -0.278
6833: [S43]
##          :          Distance <= -0.7818195:
##          :          :...Distance > -0.9010243:

```

```

##          :          :...Propertycount <= -0.070085
59: h (69/10)
##          :          :   Propertycount > -0.0700855
9:
##          :          :   :...Price > -0.2930051: h
(56/4)
##          :          :       Price <= -0.2930051:
##          :          :       :...Price <= -0.351977
5: h (6/2)
##          :          :       Price > -0.3519775
:
##          :          :       :...Date <= 0.7020
426: t (7)
##          :          :       Date > 0.70204
26: h (3/1)
##          :          :   Distance <= -0.9010243:
##          :          :   :...Distance <= -1.271884:
##          :          :   :...Postcode <= -0.5672551
: t (4/1)
##          :          :   Postcode > -0.5672551:
##          :          :   :...Date <= -0.3378632
: [S44]
##          :          :       Date > -0.3378632:
##          :          :       :...X <= -0.280481
8: u (3/1)
##          :          :       X > -0.2804818
: h (10/1)
##          :          :   Distance > -1.271884:
##          :          :   :...Postcode > -0.5353914:
##          :          :   :...Price <= -0.228135
6: [S45]
##          :          :       Price > -0.2281356
:
##          :          :       :...X > 1.159337:
t (6)
##          :          :       X <= 1.159337:
[S46]
##          :          :   Postcode <= -0.5353914
:
##          :          :   :...Date <= -0.9125479
: h (63/11)
##          :          :       Date > -0.9125479:
[S47]
##          :   Distance > -0.5301648:
##          :   :...Price > -0.3667205: h (974/84)
##          :   Price <= -0.3667205:
##          :   :...Distance > -0.09308049:
##          :       :...Propertycount > 1.789292: h (166/5)
##          :       :   Propertycount <= 1.789292:
##          :       :   :...Price > -0.7656261:

```

```

##          :      :...Postcode > -0.3203119:
##          :      :      :...Propertycount > -1.39036:
h (239/55)
##          :      :      : Propertycount <= -1.39036:
##          :      :      : ...Date <= 0.0999919: h (
17)
##          :      :      :      : Date > 0.0999919:
##          :      :      :      : ...Date <= 1.030434:
t (8)
##          :      :      :      : Date > 1.030434: h
(2)
##          :      :      : Postcode <= -0.3203119:
##          :      :      : ...Propertycount > -1.171174:
h (1127/61)
##          :      :      : Propertycount <= -1.171174
:
##          :      :      : ...Postcode <= -0.4079369
: h (133/13)
##          :      :      : Postcode > -0.4079369:
##          :      :      : ...Date > 0.8115064:
h (5)
##          :      :      : Date <= 0.8115064:
##          :      :      : ...Date <= 0.0726
2596: h (4)
##          :      :      : Date > 0.07262
596: u (7)
##          :      : Price <= -0.7656261:
##          :      : ...Postcode > -0.5513232:
##          :      :      : ...Date <= -0.2557653:
##          :      :      : ...Price <= -1.014152: u
(10/5)
##          :      :      : Price > -1.014152:
##          :      :      : ...Distance > 0.23804
4: h (104/12)
##          :      :      : Distance <= 0.2380
44: [S48]
##          :      :      : Date > -0.2557653:
##          :      :      : ...Postcode > -0.3203119:
u (5)
##          :      :      : Postcode <= -0.3203119
:
##          :      :      : ...Distance > 0.19830
91:
##          :      :      : ...Price <= -0.81
78587: u (20/6)
##          :      :      : Price > -0.817
8587: [S49]
##          :      :      : Distance <= 0.1983
091: [S50]
##          :      : Postcode <= -0.5513232:

```

```

##      :      :...Propertycount <= -0.960513
8: h (174/21)
##      :      Propertycount > -0.9605138
:
##      :      :...Propertycount <= -0.81
35673:
##      :      :...Date <= -1.131475:
h (17/7)
##      :      :   Date > -1.131475:
u (14/5)
##      :      Propertycount > -0.813
5673:
##      :      :...Date <= -0.9946458
:
##      :      :...Price > -1.170
008: h (68/1)
##      :      :   Price <= -1.17
0008:
##      :      :   :...X <= -0.37
36991: h (2)
##      :      :       X > -0.373
6991: u (2)
##      :      Date > -0.9946458:
##      :      :...Postcode <= -0
.8062324:
##      :      :...Price > -0
.8498722: [S51]
##      :      :   Price <= -
0.8498722: [S52]
##      :      Postcode > -0.
8062324:
##      :      :...Distance <
= 0.4764537: [S53]
##      :      Distance >
0.4764537: [S54]
##      Distance <= -0.09308049:
##      :...Postcode <= -0.8062324:
##      :...Propertycount > -1.031183: h (338/
51)
##      :   Propertycount <= -1.031183:
##      :   :...Date > 0.5925789: t (6/2)
##      :       Date <= 0.5925789:
##      :       :...Price > -0.6561061: h (12/
1)
##      :       Price <= -0.6561061:
##      :       :...Date <= -1.131475: h (
2)
##      :       Date > -1.131475: u (8
/1)
##      Postcode > -0.8062324:

```

```

##          :...Price > -0.537319:
##          :...Propertycount <= -1.155246:
##          :    :...Propertycount <= -1.31498:
h (17/1)
##          :    :    Propertycount > -1.31498:
##          :    :    :...X <= 0.2453345:
##          :    :    :...Price <= -0.426114
1: u (2)
##          :    :    :    Price > -0.4261141
: h (3)
##          :    :    X > 0.2453345:
##          :    :    :...X <= 1.231199: u (
4)
##          :    :    X > 1.231199: t (3
/1)
##          :    Propertycount > -1.155246:
##          :    :...Postcode > -0.3282778:
##          :    :...X <= -0.03706255: h (7
/1)
##          :    :    X > -0.03706255:
##          :    :    :...Price <= -0.421901
8: t (6/1)
##          :    :    Price > -0.4219018
: u (3/1)
##          :    Postcode <= -0.3282778:
##          :    :...Date <= -0.4473269: h
(132/16)
##          :    Date > -0.4473269: [S5
5]
##          Price <= -0.537319:
##          :...Price <= -0.8359716:
##          :...Distance <= -0.5169199: h
(6)
##          :    Distance > -0.5169199:
##          :    :...Price <= -1.020049: t
(3/1)
##          :    Price > -1.020049:
##          :    :...Date <= -1.651428:
##          :    :...X > 0.6616285:
h (3/1)
##          :    :    X <= 0.6616285
: [S56]
##          :    Date > -1.651428:
[S57]
##          Price > -0.8359716:
##          :...Date <= -1.022012: h (141/
41)
##          Date > -1.022012:
##          :...Distance <= -0.2520203
:

```



```

##                                     :...Distance > -0.3977
15: h (14/6)
##                                     :   Distance <= -0.397
715: [S58]
##                                     Distance > -0.2520203:
##                                     :...Propertycount <= -
0.7879919: [S59]
##                                     Propertycount > -0
.7879919:
##                                     :...Price <= -0.69
14895: t (47/20)
##                                     Price > -0.691
4895:
##                                     :...Postcode <
= -0.6708119: [S60]
##                                     Postcode >
-0.6708119: [S61]
##
## SubTree [S1]
##
## Postcode <= 0.4125518: t (7)
## Postcode > 0.4125518:
## :...Date <= 0.4557492: t (4/1)
##   Date > 0.4557492: u (13/2)
##
## SubTree [S2]
##
## Date <= 0.4557492: h (4/1)
## Date > 0.4557492: t (18/6)
##
## SubTree [S3]
##
## Propertycount <= -1.142458: t (3/1)
## Propertycount > -1.142458: h (14/2)
##
## SubTree [S4]
##
## Price <= -0.427799: t (3/1)
## Price > -0.427799: u (2)
##
## SubTree [S5]
##
## Propertycount <= -0.9605138: h (2)
## Propertycount > -0.9605138: u (30/5)
##
## SubTree [S6]
##
## Propertycount <= 0.4059761: t (2/1)
## Propertycount > 0.4059761:
## :...Date > -1.131475: h (5/1)

```

```

##      Date <= -1.131475:
##      :...Date <= -1.377769: h (2/1)
##      Date > -1.377769: u (3)
##
## SubTree [S7]
##
## Price > -0.6047159: u (10/3)
## Price <= -0.6047159:
## :...Price <= -0.6729553:
##      :...Price <= -0.9433854: h (2)
##      :   Price > -0.9433854: u (29/5)
##      Price > -0.6729553:
##      :...X <= 0.7391998: h (6)
##      X > 0.7391998: u (5/1)
##
## SubTree [S8]
##
## Price <= -0.7007565: t (3)
## Price > -0.7007565: u (2)
##
## SubTree [S9]
##
## Postcode <= -0.4716642: t (10/1)
## Postcode > -0.4716642:
## :...Date <= -0.3925951: u (2)
##      Date > -0.3925951: t (2)
##
## SubTree [S10]
##
## Propertycount <= 0.9778333: u (13/3)
## Propertycount > 0.9778333: t (2)
##
## SubTree [S11]
##
## Postcode <= -0.3601414: h (30/14)
## Postcode > -0.3601414: t (2)
##
## SubTree [S12]
##
## Distance <= 0.3572488: h (12/2)
## Distance > 0.3572488:
## :...X <= -0.6954582: h (3/1)
##      X > -0.6954582:
##      :...Postcode <= -0.4955619: u (3)
##      Postcode > -0.4955619: t (3/1)
##
## SubTree [S13]
##
## Propertycount > 0.675864: u (20/9)
## Propertycount <= 0.675864:

```

```

## :...Distance <= -0.3050002: h (4/1)
##   Distance > -0.3050002:
##   :...Distance <= 0.09234923: t (2)
##     Distance > 0.09234923:
##       :...Price <= -0.8574544: t (4/1)
##         Price > -0.8574544: h (4)
##
## SubTree [S14]
##
## Propertycount > 0.1145509: u (30/11)
## Propertycount <= 0.1145509:
## :...X <= 0.1943339: t (2)
##   X > 0.1943339: u (2)
##
## SubTree [S15]
##
## Propertycount <= -0.8135673:
## :...X > -0.5482758: u (16/4)
## :   X <= -0.5482758:
## :     :...X <= -1.101651: u (4/1)
## :       X > -1.101651: t (3)
## Propertycount > -0.8135673:
## :...Postcode <= -0.662846: t (2)
##   Postcode > -0.662846:
##     :...Price <= -0.8414476: u (7/1)
##       Price > -0.8414476:
##         :...Price <= -0.7706808: t (20/4)
##           Price > -0.7706808:
##             :...Price <= -0.6957018: u (22/8)
##               Price > -0.6957018: t (2)
##
## SubTree [S16]
##
## Propertycount <= 0.8519754: t (31/6)
## Propertycount > 0.8519754:
## :...X <= 0.6610246: u (11/2)
##   X > 0.6610246:
##     :...X <= 1.129802: h (2)
##       X > 1.129802: u (2)
##
## SubTree [S17]
##
## Distance > -0.9010243: h (53/29)
## Distance <= -0.9010243:
## :...Price <= -0.5036205: u (22/9)
##   Price > -0.5036205:
##     :...X <= -1.31021: h (3)
##       X > -1.31021: t (5/1)
##
## SubTree [S18]

```

```
##
## Postcode > -0.6389483: h (7/1)
## Postcode <= -0.6389483:
## :...Date <= -0.9946458: h (2/1)
##   Date > -0.9946458: t (2)
##
## SubTree [S19]
##
## Propertycount <= -0.9919222:
## :...Date <= -0.06420375: t (6/1)
## :   Date > -0.06420375: u (11/2)
## Propertycount > -0.9919222:
## :...Date <= 0.8662383: u (19/2)
##   Date > 0.8662383:
##     :...Price <= -0.6013461: h (2/1)
##     Price > -0.6013461:
##       :...X <= 0.6274269: u (3)
##       X > 0.6274269: h (2)
##
## SubTree [S20]
##
## Date <= -1.213573: u (3)
## Date > -1.213573: h (3)
##
## SubTree [S21]
##
## Price > -0.3890458: h (4)
## Price <= -0.3890458:
## :...Date <= -0.2831313: u (3/1)
##   Date > -0.2831313: h (3/1)
##
## SubTree [S22]
##
## Postcode <= -0.5991187: u (4/1)
## Postcode > -0.5991187: t (2)
##
## SubTree [S23]
##
## Postcode > -0.5991187: h (3)
## Postcode <= -0.5991187:
## :...X > 0.6348381: h (7/1)
##   X <= 0.6348381:
##     :...X > -0.01246809: t (5)
##     X <= -0.01246809:
##       :...Postcode > -0.662846: h (3/1)
##       Postcode <= -0.662846:
##         :...Date <= 0.8115064: h (3)
##         Date > 0.8115064: t (2)
##
## SubTree [S24]
```

```

##
## Propertycount > -1.142458: t (4/1)
## Propertycount <= -1.142458:
## :...X <= -0.6716872: h (3/1)
##     X > -0.6716872: u (5/1)
##
## SubTree [S25]
##
## Propertycount <= -0.9400983: h (3)
## Propertycount > -0.9400983: t (2)
##
## SubTree [S26]
##
## Date <= 1.523021: t (15/4)
## Date > 1.523021: h (3)
##
## SubTree [S27]
##
## Propertycount <= -1.197199: t (3/1)
## Propertycount > -1.197199: h (85/25)
##
## SubTree [S28]
##
## Date <= -0.1736675: h (5/1)
## Date > -0.1736675: u (5/2)
##
## SubTree [S29]
##
## Postcode <= -0.009641394: u (5/1)
## Postcode > -0.009641394:
## :...Postcode <= 0.1656086: t (4)
##     Postcode > 0.1656086:
##     :...X <= -0.3083152: u (4/1)
##         X > -0.3083152: t (2)
##
## SubTree [S30]
##
## Price > 0.8375782: t (12/1)
## Price <= 0.8375782:
## :...Date <= 1.030434: u (8/1)
##     Date > 1.030434:
##     :...Date <= 1.331459: h (2)
##         Date > 1.331459: t (3/1)
##
## SubTree [S31]
##
## Propertycount <= -0.4227571: h (27/9)
## Propertycount > -0.4227571:
## :...Date <= -0.3104972: u (4/1)
##     Date > -0.3104972:

```

```

##      :...X <= 0.5228455: t (3/1)
##      X > 0.5228455: h (3/1)
##
## SubTree [S32]
##
## Propertycount <= -0.6643775: t (4/1)
## Propertycount > -0.6643775: h (36/7)
##
## SubTree [S33]
##
## Postcode <= -0.1211641: t (2)
## Postcode > -0.1211641: h (54/12)
##
## SubTree [S34]
##
## Price <= -0.05964331: u (7/2)
## Price > -0.05964331: t (2)
##
## SubTree [S35]
##
## Propertycount <= -0.4510247: u (23/11)
## Propertycount > -0.4510247:
## :...Date > 1.249362: h (3)
##      Date <= 1.249362:
##      :...Date <= -1.561512:
##      :...Price <= -0.4446482: h (3/1)
##      :   Price > -0.4446482: t (2)
##      Date > -1.561512:
##      :...Date <= -0.6662545: u (5)
##      Date > -0.6662545:
##      :...X > 0.1988356: u (4/1)
##      X <= 0.1988356:
##      :...X <= -1.416328: t (2)
##      X > -1.416328: h (3/1)
##
## SubTree [S36]
##
## Propertycount <= -1.456318: t (2)
## Propertycount > -1.456318: h (4/1)
##
## SubTree [S37]
##
## Postcode > -0.8779256: t (4)
## Postcode <= -0.8779256:
## :...Price <= -0.4741344: t (2)
##      Price > -0.4741344: h (3)
##
## SubTree [S38]
##
## Postcode <= -0.5194596: u (3/1)

```

```
## Postcode > -0.5194596:
## :...Price <= -0.4699221: t (2)
##   Price > -0.4699221: h (2)
##
## SubTree [S39]
##
## Propertycount <= -0.945707: t (4/1)
## Propertycount > -0.945707:
## :...X <= -0.5402057: h (14/5)
##   X > -0.5402057: t (5)
##
## SubTree [S40]
##
## Price <= -0.1186156: t (2)
## Price > -0.1186156: h (2)
##
## SubTree [S41]
##
## Date <= 1.523021: u (3)
## Date > 1.523021: h (2/1)
##
## SubTree [S42]
##
## Postcode > -0.662846: u (7/3)
## Postcode <= -0.662846:
## :...Date <= 0.7294086: t (5)
##   Date > 0.7294086: u (4)
##
## SubTree [S43]
##
## Date > 0.9483361: t (6)
## Date <= 0.9483361:
## :...Price <= -0.1919098: t (7/3)
##   Price > -0.1919098:
## :...Price <= -0.1514716: u (8/1)
##   Price > -0.1514716: t (3/1)
##
## SubTree [S44]
##
## Propertycount <= -0.5461472: t (4/1)
## Propertycount > -0.5461472: u (3)
##
## SubTree [S45]
##
## Propertycount <= -0.3879835: t (10/1)
## Propertycount > -0.3879835:
## :...Price <= -0.3199639: t (2)
##   Price > -0.3199639: u (4)
##
## SubTree [S46]
```

```

##
## Postcode > -0.4955619: h (20/7)
## Postcode <= -0.4955619:
## :...X <= 0.5624821: t (6/2)
##     X > 0.5624821: h (2)
##
## SubTree [S47]
##
## Distance > -1.232149: h (68/31)
## Distance <= -1.232149:
## :...Propertycount <= -0.7087979:
##     :...X <= -0.5880771: h (3)
##     :   X > -0.5880771: t (4/2)
##     Propertycount > -0.7087979:
##     :...Date > 1.550387: h (2)
##     Date <= 1.550387:
##     :...Price > -0.1379922: t (9)
##     Price <= -0.1379922:
##     :...Price <= -0.2011769: t (4/1)
##     Price > -0.2011769: h (2)
##
## SubTree [S48]
##
## Propertycount <= -0.9741989: u (2)
## Propertycount > -0.9741989:
## :...Date <= -1.487233: h (10/1)
##     Date > -1.487233:
##     :...Date <= -1.377769: u (2)
##     Date > -1.377769:
##     :...X <= -0.2907477: h (2/1)
##     X > -0.2907477: t (4/1)
##
## SubTree [S49]
##
## Postcode <= -0.3920051: u (3/1)
## Postcode > -0.3920051: h (4)
##
## SubTree [S50]
##
## Propertycount > 0.0008076641: t (3)
## Propertycount <= 0.0008076641:
## :...Price <= -0.843975: h (3)
##     Price > -0.843975:
##     :...Date <= 0.8115064: t (2)
##     Date > 0.8115064:
##     :...Price <= -0.7917424: u (3)
##     Price > -0.7917424: h (2)
##
## SubTree [S51]
##

```



```

## Price <= -0.7984821: t (8/1)
## Price > -0.7984821: h (2)
##
## SubTree [S52]
##
## X <= -0.9279526: h (3/1)
## X > -0.9279526:
## :...Date <= 0.2915535: u (7/2)
##     Date > 0.2915535: h (2/1)
##
## SubTree [S53]
##
## Date <= 1.249362: h (79/21)
## Date > 1.249362:
## :...X <= -0.6319408: h (2)
##     X > -0.6319408: t (6)
##
## SubTree [S54]
##
## Price > -0.9021049: h (16)
## Price <= -0.9021049:
## :...Date <= 0.1312673: h (7/1)
##     Date > 0.1312673:
##         :...Date <= 0.5925789: u (4)
##             Date > 0.5925789:
##                 :...Price <= -0.9880359: h (2)
##                     Price > -0.9880359: u (3/1)
##
## SubTree [S55]
##
## Propertycount > 1.656255: h (90/18)
## Propertycount <= 1.656255:
## :...X <= -0.2399119:
##     :...Postcode > -0.750471: h (83/18)
##     :     Postcode <= -0.750471:
##     :         :...Price <= -0.4345387: u (4/1)
##     :             Price > -0.4345387: h (2/1)
##     X > -0.2399119:
##     :...Propertycount <= -0.6219761:
##     :         :...Propertycount > -0.8135673: h (11/2)
##     :             Propertycount <= -0.8135673:
##     :                 :...Postcode <= -0.6389483: t (10/3)
##     :                     Postcode > -0.6389483: h (25/11)
##     Propertycount > -0.6219761:
##     :...Date <= 0.537847:
##     :         :...X <= -0.1423575: t (3)
##     :             X > -0.1423575: h (28/10)
##     :             Date > 0.537847:
##     :                 :...Distance <= -0.3182452: t (4)
##     :                     Distance > -0.3182452:

```

```

##             :...Price <= -0.3941005: h (13/4)
##             Price > -0.3941005: t (5)
##
## SubTree [S56]
##
## Price <= -0.8810433: u (4)
## Price > -0.8810433: t (3)
##
## SubTree [S57]
##
## Distance <= -0.397715: u (3)
## Distance > -0.397715:
## :...Price <= -0.9147418: h (6)
##     Price > -0.9147418:
##     :...Postcode > -0.5114937:
##         :...Date <= -1.432501: h (3)
##         :   Date > -1.432501: u (8)
##         Postcode <= -0.5114937:
##         :...Postcode <= -0.6389483: u (2)
##         Postcode > -0.6389483:
##         :...X <= -0.4351303: h (6/1)
##         X > -0.4351303:
##         :...Price <= -0.8810433: u (3)
##         Price > -0.8810433:
##         :...X <= 0.2360566: u (2)
##         X > 0.2360566: h (6/1)
##
## SubTree [S58]
##
## Propertycount > -1.076501:
## :...Price <= -0.5625929: u (19/10)
## :   Price > -0.5625929: t (2)
## Propertycount <= -1.076501:
## :...X > -1.100004: h (8/1)
##     X <= -1.100004:
##     :...Propertycount <= -1.311391: u (2)
##     Propertycount > -1.311391:
##     :...X <= -1.411497: h (2)
##     X > -1.411497: u (2)
##
## SubTree [S59]
##
## Propertycount <= -1.112845:
## :...X <= 0.9233837: h (5/1)
## :   X > 0.9233837: t (2)
## Propertycount > -1.112845:
## :...Date > 0.2915535: u (4)
##     Date <= 0.2915535:
##     :...Date <= -0.4473269: u (3)
##     Date > -0.4473269: t (3)

```

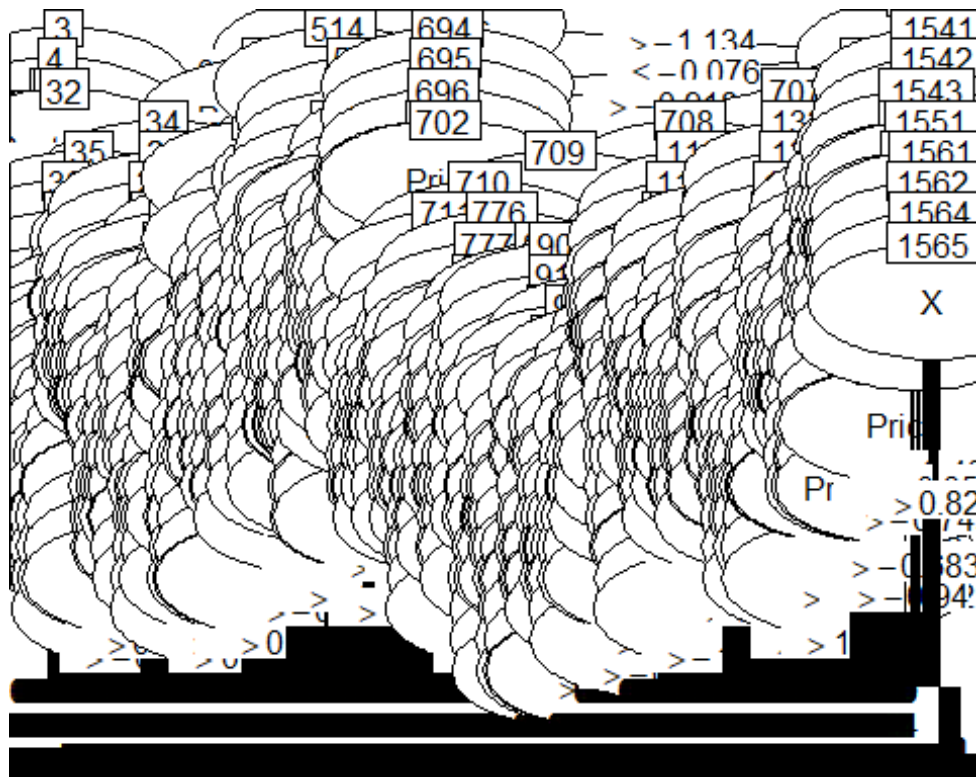
```

##
## SubTree [S60]
##
## X <= 0.07811415: h (7)
## X > 0.07811415:
## :...Price <= -0.6198802: h (3)
##   Price > -0.6198802: t (4/1)
##
## SubTree [S61]
##
## Postcode <= -0.5114937:
## :...Date > 0.7020426: h (17/4)
## :   Date <= 0.7020426:
## :     :...Date > 0.5104811: u (3)
## :       Date <= 0.5104811:
## :         :...X <= 1.43564: h (23/10)
## :           X > 1.43564:
## :             :...X <= 1.584195: u (2)
## :               X > 1.584195: h (2)
## Postcode > -0.5114937:
## :...Price <= -0.5583805: h (63/28)
##   Price > -0.5583805:
##     :...Price <= -0.5541682: t (5)
##       Price > -0.5541682:
##         :...X <= 0.05039049:
##           :...Date <= 1.358825: t (5)
##             :   Date > 1.358825: h (2/1)
##               X > 0.05039049:
##                 :...Price <= -0.548271: h (2)
##                   Price > -0.548271: u (2)
##
##
## Evaluation on training data (39052 cases):
##
##   Decision Tree
##   -----
##   Size      Errors
##
##   786 4687(12.0%)  <<
##
##
##   (a)  (b)  (c)  <-classified as
##   ----  ----  ----
##   26595  389   536  (a): class h
##   2152   1388  522  (b): class t
##   919    169  6382  (c): class u
##
##
## Attribute usage:
##

```

```
## 100.00% Rooms
## 93.74% Distance
## 79.89% Postcode
## 73.49% Price
## 29.46% Propertycount
## 14.24% Date
## 5.03% X
##
##
## Time: 15.7 secs
```

```
plot(tree_mod)
```



```
## Model
```

Predictions

```
tree_pred<-predict(tree_mod,test2[, -3])

confusionMatrix(table(tree_pred,test2$Type))

## Confusion Matrix and Statistics
##
##
## tree_pred   h    t    u
##      h 6267  546  333
##      t  160  205   95
##      u   214  167 1394
##
## Overall Statistics
```

```
##
##           Accuracy : 0.8385
##           95% CI : (0.8309, 0.8459)
##      No Information Rate : 0.7079
##      P-Value [Acc > NIR] : < 2.2e-16
##
##           Kappa : 0.6147
##
##  McNemar's Test P-Value : < 2.2e-16
##
## Statistics by Class:
##
##               Class: h Class: t Class: u
## Sensitivity         0.9437  0.22331  0.7651
## Specificity         0.6792  0.96987  0.9496
## Pos Pred Value      0.8770  0.44565  0.7854
## Neg Pred Value      0.8327  0.92008  0.9437
## Prevalence          0.7079  0.09786  0.1942
## Detection Rate      0.6681  0.02185  0.1486
## Detection Prevalence 0.7618  0.04904  0.1892
## Balanced Accuracy    0.8114  0.59659  0.8573
```

Using confusion matrix to predict the accuracy of the results, it was observed that the model would result to 83.31% accuracy with 95% confidence interval between 82.54% and 84.06%.

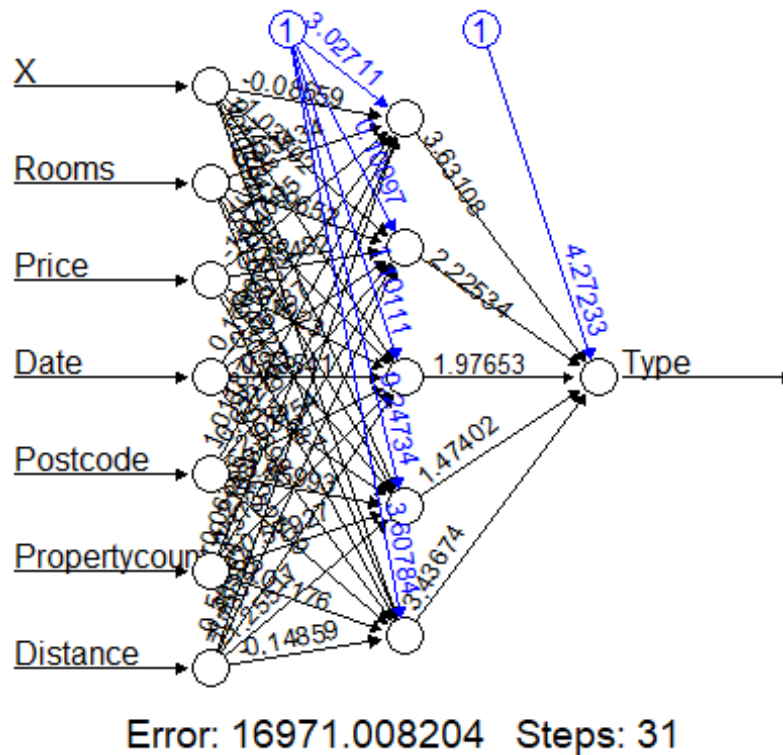
## ANN model

```
library(neuralnet)

##
## Attaching package: 'neuralnet'

## The following object is masked from 'package:dplyr':
##      compute

training2$Type<-as.integer(training2$Type)
Modelling<-neuralnet(Type~.,linear.output=FALSE,likelihood=TRUE,data=training
2,hidden=5)
plot(Modelling,rep="best")
```



## Model performance

Using confusion matrix to predict the accuracy of the results, it was observed that the model would result to 76.83% accuracy with 95% confidence interval between 78.09% and 77.57%.

## Model Comparison

Comparing the three models, it was noted that C5.0 model was the highest accurately classified with highest classification of 83.31%.