Hotel Recommendations (R)

Gabriel Valenzuela

7/4/2020

## Hotel Recommendation Data Preparation and EDA

# Data Preparation

##   
## Attaching package: 'dplyr'

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

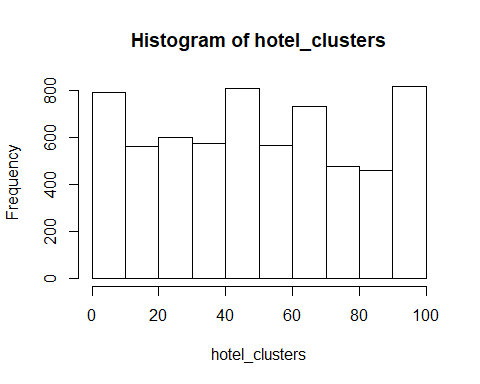
## The following objects are masked from 'package:base':  
##   
## intersect, setdiff, setequal, union

## date\_time site\_name posa\_continent   
## FALSE FALSE FALSE   
## user\_location\_country user\_location\_region user\_location\_city   
## FALSE FALSE FALSE   
## orig\_destination\_distance user\_id is\_mobile   
## FALSE FALSE FALSE   
## is\_package channel srch\_ci   
## FALSE FALSE FALSE   
## srch\_co srch\_adults\_cnt srch\_children\_cnt   
## FALSE FALSE FALSE   
## srch\_rm\_cnt srch\_destination\_id srch\_destination\_type\_id   
## FALSE FALSE FALSE   
## is\_booking cnt hotel\_continent   
## FALSE FALSE FALSE   
## hotel\_country hotel\_market hotel\_cluster   
## FALSE FALSE FALSE

# Exploratory Data Analysis

## 'data.frame': 6385 obs. of 27 variables:  
## $ date\_year : int 2014 2014 2013 2014 2013 2013 2014 2013 2013 2014 ...  
## $ date\_month : int 7 11 3 6 1 10 11 9 5 6 ...  
## $ site\_name : int 11 2 34 2 2 2 2 2 2 2 ...  
## $ posa\_continent : int 3 3 3 3 3 3 3 3 3 3 ...  
## $ user\_location\_country : int 205 66 66 66 66 66 66 66 66 66 ...  
## $ user\_location\_region : int 354 462 258 314 174 149 447 184 174 189 ...  
## $ user\_location\_city : int 25315 49272 4687 32759 46432 32073 33335 27733 27251 33796 ...  
## $ orig\_destination\_distance: int 1632 2733 2057 4171 2387 5198 7 2409 5034 1691 ...  
## $ user\_id : int 6450 57017 59300 102383 144246 165915 181701 183606 218025 227402 ...  
## $ is\_mobile : int 0 1 0 0 0 0 0 0 0 0 ...  
## $ is\_package : int 1 0 0 0 1 0 0 0 0 1 ...  
## $ channel : int 5 9 9 9 9 9 9 9 9 1 ...  
## $ CheckIn\_year : int 2015 2014 2013 2014 2013 2013 2014 2013 2013 2014 ...  
## $ CheckIn\_month : int 2 11 4 7 4 12 11 12 6 12 ...  
## $ CheckOut\_year : int 2015 2014 2013 2014 2013 2013 2014 2013 2013 2014 ...  
## $ CheckOut\_month : int 2 11 4 8 4 12 11 12 6 12 ...  
## $ srch\_adults\_cnt : int 2 2 1 1 2 2 2 1 2 2 ...  
## $ srch\_children\_cnt : int 0 0 1 0 0 1 0 0 0 0 ...  
## $ srch\_rm\_cnt : int 1 1 1 1 1 1 1 1 1 1 ...  
## $ srch\_destination\_id : int 11938 8260 44249 8739 48752 33390 12843 42293 25210 11938 ...  
## $ srch\_destination\_type\_id : int 1 1 8 1 4 6 5 6 6 1 ...  
## $ is\_booking : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ cnt : int 1 2 1 1 1 1 1 2 2 4 ...  
## $ hotel\_continent : int 4 2 4 6 4 6 2 2 6 4 ...  
## $ hotel\_country : int 8 50 51 144 8 105 50 50 31 8 ...  
## $ hotel\_market : int 126 701 1509 4 110 12 661 649 1464 126 ...  
## $ hotel\_cluster : int 80 77 0 90 66 43 9 48 64 65 ...  
## - attr(\*, "na.action")= 'omit' Named int 790 3133 4605 4911 4923  
## ..- attr(\*, "names")= chr "1228" "4865" "7161" "7642" ...

## date\_year date\_month site\_name posa\_continent   
## Min. :2013 Min. : 1.000 Min. : 2.000 Min. :0.000   
## 1st Qu.:2013 1st Qu.: 4.000 1st Qu.: 2.000 1st Qu.:3.000   
## Median :2014 Median : 7.000 Median : 2.000 Median :3.000   
## Mean :2014 Mean : 7.027 Mean : 6.202 Mean :2.902   
## 3rd Qu.:2014 3rd Qu.:10.000 3rd Qu.: 2.000 3rd Qu.:3.000   
## Max. :2014 Max. :12.000 Max. :40.000 Max. :4.000   
## user\_location\_country user\_location\_region user\_location\_city  
## Min. : 0.00 Min. : 135.0 Min. : 3   
## 1st Qu.: 66.00 1st Qu.: 174.0 1st Qu.:14703   
## Median : 66.00 Median : 318.0 Median :27655   
## Mean : 87.09 Mean : 311.5 Mean :28293   
## 3rd Qu.: 66.00 3rd Qu.: 363.0 3rd Qu.:43356   
## Max. :215.00 Max. :1017.0 Max. :56498   
## orig\_destination\_distance user\_id is\_mobile is\_package   
## Min. : 0 Min. : 816 Min. :0.000 Min. :0.0000   
## 1st Qu.: 314 1st Qu.: 293893 1st Qu.:0.000 1st Qu.:0.0000   
## Median : 1170 Median : 588508 Median :0.000 Median :0.0000   
## Mean : 1980 Mean : 593443 Mean :0.137 Mean :0.2473   
## 3rd Qu.: 2528 3rd Qu.: 885264 3rd Qu.:0.000 3rd Qu.:0.0000   
## Max. :11356 Max. :1198748 Max. :1.000 Max. :1.0000   
## channel CheckIn\_year CheckIn\_month CheckOut\_year   
## Min. : 0.000 Min. :2013 Min. : 1.000 Min. :2013   
## 1st Qu.: 2.000 1st Qu.:2013 1st Qu.: 5.000 1st Qu.:2013   
## Median : 9.000 Median :2014 Median : 7.000 Median :2014   
## Mean : 5.972 Mean :2014 Mean : 7.194 Mean :2014   
## 3rd Qu.: 9.000 3rd Qu.:2014 3rd Qu.:10.000 3rd Qu.:2014   
## Max. :10.000 Max. :2015 Max. :12.000 Max. :2015   
## CheckOut\_month srch\_adults\_cnt srch\_children\_cnt srch\_rm\_cnt   
## Min. : 1.000 Min. :0.000 Min. :0.000 Min. :1.000   
## 1st Qu.: 4.000 1st Qu.:2.000 1st Qu.:0.000 1st Qu.:1.000   
## Median : 7.000 Median :2.000 Median :0.000 Median :1.000   
## Mean : 7.012 Mean :2.048 Mean :0.358 Mean :1.106   
## 3rd Qu.:10.000 3rd Qu.:2.000 3rd Qu.:0.000 3rd Qu.:1.000   
## Max. :12.000 Max. :9.000 Max. :7.000 Max. :8.000   
## srch\_destination\_id srch\_destination\_type\_id is\_booking   
## Min. : 8 Min. :1.000 Min. :0.00000   
## 1st Qu.: 8267 1st Qu.:1.000 1st Qu.:0.00000   
## Median : 9600 Median :1.000 Median :0.00000   
## Mean :14233 Mean :2.622 Mean :0.08489   
## 3rd Qu.:17584 3rd Qu.:5.000 3rd Qu.:0.00000   
## Max. :64925 Max. :8.000 Max. :1.00000   
## cnt hotel\_continent hotel\_country hotel\_market   
## Min. : 1.000 Min. :0.000 Min. : 0.00 Min. : 0.0   
## 1st Qu.: 1.000 1st Qu.:2.000 1st Qu.: 50.00 1st Qu.: 245.0   
## Median : 1.000 Median :2.000 Median : 50.00 Median : 628.0   
## Mean : 1.458 Mean :2.889 Mean : 73.02 Mean : 623.1   
## 3rd Qu.: 1.000 3rd Qu.:4.000 3rd Qu.: 77.00 3rd Qu.: 701.0   
## Max. :22.000 Max. :6.000 Max. :208.00 Max. :2117.0   
## hotel\_cluster   
## Min. : 0.00   
## 1st Qu.:25.00   
## Median :49.00   
## Mean :49.69   
## 3rd Qu.:73.00   
## Max. :99.00



## date\_year date\_month site\_name posa\_continent user\_location\_country  
## [1,] -0.01 0 -0.03 0.03 -0.02  
## user\_location\_region user\_location\_city orig\_destination\_distance user\_id  
## [1,] 0.01 0 0.01 0.02  
## is\_mobile is\_package channel CheckIn\_year CheckIn\_month CheckOut\_year  
## [1,] 0 0.05 0 0.01 -0.01 0.01  
## CheckOut\_month srch\_adults\_cnt srch\_children\_cnt srch\_rm\_cnt  
## [1,] -0.02 0.02 -0.01 -0.02  
## srch\_destination\_id srch\_destination\_type\_id is\_booking cnt  
## [1,] -0.02 -0.04 -0.04 0  
## hotel\_continent hotel\_country hotel\_market hotel\_cluster  
## [1,] -0.03 -0.02 0.04 1

## date\_year date\_month site\_name posa\_continent user\_location\_country  
## 1 2014 7 11 3 205  
## 2 2014 11 2 3 66  
## 4 2014 6 2 3 66  
## 5 2013 1 2 3 66  
## 6 2013 10 2 3 66  
## 7 2014 11 2 3 66  
## user\_location\_region user\_location\_city orig\_destination\_distance user\_id  
## 1 354 25315 1632 6450  
## 2 462 49272 2733 57017  
## 4 314 32759 4171 102383  
## 5 174 46432 2387 144246  
## 6 149 32073 5198 165915  
## 7 447 33335 7 181701  
## is\_mobile is\_package channel CheckIn\_year CheckIn\_month CheckOut\_year  
## 1 0 1 5 2015 2 2015  
## 2 1 0 9 2014 11 2014  
## 4 0 0 9 2014 7 2014  
## 5 0 1 9 2013 4 2013  
## 6 0 0 9 2013 12 2013  
## 7 0 0 9 2014 11 2014  
## CheckOut\_month srch\_adults\_cnt srch\_children\_cnt srch\_rm\_cnt  
## 1 2 2 0 1  
## 2 11 2 0 1  
## 4 8 1 0 1  
## 5 4 2 0 1  
## 6 12 2 1 1  
## 7 11 2 0 1  
## srch\_destination\_id srch\_destination\_type\_id is\_booking cnt hotel\_continent  
## 1 11938 1 0 1 4  
## 2 8260 1 0 2 2  
## 4 8739 1 0 1 6  
## 5 48752 4 0 1 4  
## 6 33390 6 0 1 6  
## 7 12843 5 0 1 2  
## hotel\_country hotel\_market hotel\_cluster d1 d2 d3  
## 1 8 126 80 -2.071236 -2.101043 -2.288674  
## 2 50 701 77 -2.221347 -2.278933 -2.279183  
## 4 144 4 90 -2.216031 -2.176924 -2.247798  
## 5 8 110 66 -2.276515 -2.342028 -2.330296  
## 6 105 12 43 -2.208848 -2.210931 -2.210931  
## 7 50 661 9 -2.203531 -2.235189 -2.236061  
## d4 d5 d6 d7 d8 d9 d10  
## 1 -2.312564 -2.278367 -1.831994 -2.321990 -2.321639 -1.419844 -2.274446  
## 2 -2.241826 -2.106054 -1.791516 -2.260111 -2.247473 -1.357539 -2.250741  
## 4 -2.112909 -1.994632 -1.882668 -2.259694 -2.246860 -2.228478 -2.097532  
## 5 -2.342028 -2.297696 -1.860612 -2.342028 -2.321596 -1.417634 -2.306657  
## 6 -2.175105 -2.112442 -1.988445 -2.210931 -2.210931 -2.209746 -2.208617  
## 7 -2.228264 -2.203985 -2.053816 -2.218924 -2.213719 -2.235378 -2.204407  
## d11 d12 d13 d14 d15 d16 d17  
## 1 -2.211547 -2.322637 -2.050363 -2.145265 -2.322293 -2.271078 -2.302421  
## 2 -2.174938 -2.279183 -2.124096 -1.998064 -2.279183 -1.981550 -2.219537  
## 4 -2.085450 -2.259694 -2.119563 -2.156568 -2.259061 -2.068200 -2.138903  
## 5 -2.173442 -2.342028 -2.292651 -2.253766 -2.342028 -2.252920 -2.302785  
## 6 -2.161803 -2.210931 -2.210931 -2.173870 -2.210931 -2.139372 -2.190810  
## 7 -2.200014 -2.236061 -2.210182 -1.971755 -2.236061 -1.971406 -2.207884  
## d18 d19 d20 d21 d22 d23 d24  
## 1 -2.318340 -2.317820 -2.317939 -2.322621 -2.322637 -2.319607 -2.317377  
## 2 -2.272621 -2.278078 -2.266412 -2.276473 -2.279183 -2.279183 -2.264000  
## 4 -2.144478 -2.259184 -2.259251 -2.194852 -2.109622 -2.259694 -2.245551  
## 5 -2.247208 -2.342028 -2.326682 -2.342028 -2.342028 -2.342028 -2.284377  
## 6 -2.210931 -2.210931 -2.210931 -2.210931 -2.158125 -2.210931 -2.166232  
## 7 -2.216146 -2.236061 -2.235707 -2.236061 -2.236061 -2.236061 -2.227548  
## d25 d26 d27 d28 d29 d30 d31  
## 1 -2.322637 -2.311666 -2.322336 -2.303923 -2.230639 -2.320824 -2.066414  
## 2 -2.279183 -2.271491 -2.278851 -2.254004 -1.994189 -2.253474 -2.279150  
## 4 -2.259694 -2.252045 -2.081622 -2.236366 -2.101702 -2.248379 -2.259694  
## 5 -2.342028 -2.337797 -2.342028 -2.262226 -2.258002 -2.306268 -2.328581  
## 6 -2.210931 -2.202369 -2.089904 -2.205958 -2.112585 -2.201994 -2.210931  
## 7 -2.236061 -2.204120 -2.216666 -2.235807 -1.976894 -2.147909 -2.236061  
## d32 d33 d34 d35 d36 d37 d38  
## 1 -2.320212 -2.322637 -2.052503 -2.172829 -2.319533 -1.550956 -2.074133  
## 2 -2.278446 -2.279183 -2.265605 -2.211188 -2.278364 -1.526063 -2.242463  
## 4 -2.249445 -2.259694 -2.043305 -2.102579 -2.259694 -1.714438 -2.256638  
## 5 -2.342028 -2.342028 -2.310523 -2.198799 -2.342028 -1.436385 -2.300352  
## 6 -2.210635 -2.210931 -2.205691 -2.210065 -2.210931 -1.798364 -2.210931  
## 7 -2.236061 -2.208024 -2.236061 -2.208475 -2.236061 -1.635450 -2.234135  
## d39 d40 d41 d42 d43 d44 d45  
## 1 -2.074918 -2.306418 -1.951861 -2.171465 -1.920781 -2.199189 -2.318373  
## 2 -2.212653 -2.268554 -2.213626 -2.276126 -1.933169 -2.278446 -2.268193  
## 4 -2.259694 -2.256898 -2.108836 -2.186656 -2.005551 -2.259439 -2.139929  
## 5 -1.930568 -2.342028 -1.986713 -2.035153 -1.713193 -2.278210 -2.342028  
## 6 -2.210931 -2.209627 -2.207385 -2.209037 -2.008721 -2.210931 -2.210931  
## 7 -2.236061 -2.232910 -2.170114 -2.234088 -1.943136 -2.236061 -2.235932  
## d46 d47 d48 d49 d50 d51 d52  
## 1 -2.287961 -2.209745 -2.306335 -1.457148 -2.322495 -2.312106 -2.304209  
## 2 -2.239363 -2.256701 -2.277117 -1.771199 -2.255137 -2.251499 -2.259492  
## 4 -2.227667 -2.259184 -2.257945 -1.996483 -2.246858 -2.193519 -2.259100  
## 5 -2.334820 -2.321950 -2.298009 -1.341410 -2.342028 -2.342028 -2.340297  
## 6 -2.210931 -2.210931 -2.210715 -1.909669 -2.210931 -2.210931 -2.209637  
## 7 -2.235044 -2.236061 -2.220186 -1.871044 -2.218322 -2.236061 -2.221954  
## d53 d54 d55 d56 d57 d58 d59  
## 1 -2.207478 -2.321773 -2.151544 -2.290456 -2.322637 -2.004215 -2.321274  
## 2 -2.212508 -2.279183 -2.145654 -2.258800 -2.279183 -2.157771 -2.279183  
## 4 -2.027981 -2.259694 -2.231298 -2.230601 -2.199492 -1.888565 -2.246860  
## 5 -2.245988 -2.342028 -1.640023 -2.342028 -2.342028 -2.233301 -2.342028  
## 6 -2.078859 -2.210931 -2.198576 -2.201539 -2.192857 -2.024328 -2.210931  
## 7 -2.096686 -2.236061 -2.180589 -2.191522 -2.196135 -2.122665 -2.218644  
## d60 d61 d62 d63 d64 d65 d66  
## 1 -2.322637 -2.317963 -2.322637 -2.322265 -2.322637 -2.322637 -2.159400  
## 2 -2.279173 -2.278385 -2.279183 -2.279176 -2.279183 -2.279183 -2.243719  
## 4 -2.259694 -2.259184 -2.258930 -2.259694 -2.259694 -2.259694 -2.138017  
## 5 -2.342028 -2.342024 -2.342028 -2.342028 -2.342028 -2.342028 -2.321957  
## 6 -2.210931 -2.210931 -2.210931 -2.210931 -2.210931 -2.210931 -2.210931  
## 7 -2.236061 -2.235097 -2.236061 -2.233942 -2.233016 -2.236061 -2.236061  
## d67 d68 d69 d70 d71 d72 d73  
## 1 -2.322470 -2.036906 -2.263397 -2.300476 -2.322395 -2.322333 -2.310177  
## 2 -2.278382 -2.262052 -2.248912 -2.279183 -2.259754 -2.274414 -2.273360  
## 4 -2.258909 -2.258905 -2.257659 -2.259694 -2.203152 -2.258167 -2.218864  
## 5 -2.342028 -2.283983 -2.321961 -2.342028 -2.342028 -2.342028 -2.342028  
## 6 -2.210931 -2.210931 -2.210931 -2.210931 -2.210931 -2.210931 -2.195770  
## 7 -2.210753 -2.236061 -2.229355 -2.236061 -1.736463 -2.236061 -2.162259  
## d74 d75 d76 d77 d78 d79 d80  
## 1 -2.214179 -2.167823 -2.288386 -2.304922 -2.288281 -2.322637 -2.322637  
## 2 -2.088678 -2.119190 -2.236886 -2.245658 -2.278087 -2.279161 -2.263574  
## 4 -2.110164 -2.126022 -2.258675 -2.094960 -2.101658 -2.259694 -1.881929  
## 5 -2.159603 -2.205132 -2.342028 -2.291560 -2.342028 -2.342028 -2.342028  
## 6 -2.195200 -1.977052 -2.210931 -2.167212 -2.137665 -2.210554 -2.079387  
## 7 -2.121016 -2.096105 -2.219373 -2.227500 -2.236061 -2.153698 -2.205903  
## d81 d82 d83 d84 d85 d86 d87  
## 1 -2.320774 -2.319906 -2.198115 -2.167654 -2.232384 -2.322637 -2.322637  
## 2 -2.267474 -2.269478 -2.267477 -2.153936 -2.205995 -2.279183 -2.266269  
## 4 -2.200349 -2.258167 -2.259044 -2.163381 -2.190666 -2.259694 -2.210821  
## 5 -2.342028 -2.342028 -2.341016 -2.085707 -2.232911 -2.342028 -2.342028  
## 6 -2.210931 -2.210931 -2.210931 -2.188634 -2.210674 -2.210931 -2.208649  
## 7 -2.236061 -2.232668 -2.194340 -2.199181 -2.232654 -2.236061 -2.235297  
## d88 d89 d90 d91 d92 d93 d94  
## 1 -2.322328 -2.318537 -2.321190 -1.867202 -1.960430 -1.641069 -2.123351  
## 2 -2.018986 -2.274414 -2.279183 -2.033259 -2.278676 -1.575819 -2.238694  
## 4 -2.257950 -2.259439 -2.259694 -2.164565 -2.259694 -1.736126 -2.056300  
## 5 -2.321962 -2.342028 -2.342028 -1.940282 -1.848099 -1.504625 -2.342028  
## 6 -2.210931 -2.209746 -2.210931 -2.165361 -2.210931 -1.834895 -2.116957  
## 7 -2.226529 -2.230307 -2.236061 -2.154679 -2.236061 -1.688476 -2.236061  
## d95 d96 d97 d98 d99 d100 d101  
## 1 -2.318966 -2.241970 -2.318100 -2.034997 -2.322592 -2.322029 -2.269882  
## 2 -2.278814 -2.221374 -2.278078 -2.279183 -2.259629 -2.279167 -2.182860  
## 4 -2.259437 -2.145249 -2.259184 -2.172388 -2.259694 -2.259694 -2.239739  
## 5 -2.342028 -2.225498 -2.342028 -2.245842 -2.342028 -2.342028 -2.314458  
## 6 -2.210931 -2.189283 -2.210931 -2.210931 -2.210931 -2.210931 -2.210931  
## 7 -2.235097 -2.215358 -2.236061 -2.236061 -2.235634 -2.236061 -2.226513  
## d102 d103 d104 d105 d106 d107 d108  
## 1 -2.302695 -1.846940 -2.265504 -2.130116 -2.318730 -2.319724 -2.003059  
## 2 -2.261741 -1.857710 -2.273138 -2.264018 -2.267179 -2.278812 -1.838190  
## 4 -2.138114 -2.252159 -2.259694 -2.197438 -2.248617 -2.259694 -1.872815  
## 5 -2.342020 -1.799269 -2.238123 -2.209256 -2.342028 -2.342028 -2.186169  
## 6 -2.151706 -2.210931 -2.210931 -2.210867 -2.208564 -2.210931 -2.087355  
## 7 -2.234202 -2.236061 -2.236059 -2.229543 -2.236061 -2.236061 -1.985012  
## d109 d110 d111 d112 d113 d114 d115  
## 1 -2.321328 -2.321423 -2.279341 -2.322637 -2.322637 -2.236753 -1.929851  
## 2 -2.271887 -2.278446 -2.226128 -2.272243 -2.279183 -2.231622 -2.233302  
## 4 -2.107612 -2.259184 -2.259184 -2.258478 -2.259184 -2.198590 -2.259439  
## 5 -2.125460 -2.342028 -2.326870 -2.342028 -2.342028 -2.342025 -2.263255  
## 6 -2.174635 -2.209746 -2.210931 -2.208903 -2.210931 -2.210931 -2.210931  
## 7 -2.228628 -2.041506 -2.228406 -2.235958 -2.231261 -2.235831 -2.236061  
## d116 d117 d118 d119 d120 d121 d122  
## 1 -2.322637 -2.322637 -2.322637 -2.322637 -2.315205 -2.063602 -2.099735  
## 2 -2.279183 -2.279183 -2.279183 -2.278814 -2.262494 -2.135099 -2.030059  
## 4 -2.259694 -2.259694 -2.259694 -2.259694 -2.259694 -2.049334 -2.109872  
## 5 -2.342028 -2.342028 -2.342028 -2.342028 -2.260425 -1.789384 -2.081186  
## 6 -2.210931 -2.209746 -2.210931 -2.210931 -2.210931 -2.177949 -2.174215  
## 7 -2.232217 -2.181330 -2.212573 -2.214406 -2.223325 -2.073181 -2.010968  
## d123 d124 d125 d126 d127 d128 d129  
## 1 -2.322456 -2.312753 -2.320967 -2.265315 -2.291093 -1.856038 -2.322634  
## 2 -2.279183 -2.258587 -2.258165 -2.254459 -2.232340 -2.094764 -2.279183  
## 4 -2.259694 -2.259068 -2.218174 -2.216916 -2.258930 -2.128367 -2.259694  
## 5 -2.342028 -2.329102 -1.704149 -2.273588 -2.243007 -1.800669 -2.342028  
## 6 -2.210931 -2.210931 -2.210931 -2.206544 -2.210931 -1.996643 -2.210931  
## 7 -2.236061 -2.226340 -2.218807 -2.219374 -2.235097 -2.055962 -1.966227  
## d130 d131 d132 d133 d134 d135 d136  
## 1 -2.280983 -2.256044 -1.979427 -2.320928 -2.046843 -2.322637 -2.317146  
## 2 -2.220301 -2.276968 -2.138763 -2.252444 -2.235543 -2.279183 -2.217680  
## 4 -2.124438 -2.197706 -1.876310 -2.239545 -2.209550 -2.259694 -2.246758  
## 5 -2.326562 -2.333226 -1.922071 -2.342028 -2.301069 -2.342028 -2.325230  
## 6 -2.210923 -2.205037 -1.900781 -2.210931 -2.210931 -2.210931 -2.210926  
## 7 -2.126502 -2.234135 -2.181185 -2.234114 -2.236061 -2.236061 -2.189087  
## d137 d138 d139 d140 d141 d142 d143  
## 1 -2.129319 -2.322637 -2.061666 -2.302005 -2.314393 -2.131704 -2.278643  
## 2 -2.233658 -2.279183 -1.886747 -2.229237 -2.265149 -2.279183 -2.278814  
## 4 -2.142460 -2.259693 -1.934547 -2.256392 -2.258635 -2.259694 -2.259694  
## 5 -2.342028 -2.342028 -2.012938 -2.336147 -2.297696 -2.286036 -2.342028  
## 6 -2.132203 -2.210931 -1.891476 -2.210931 -2.210931 -2.210931 -2.210931  
## 7 -2.205459 -2.236061 -1.948308 -2.229355 -2.216427 -2.231119 -2.236061  
## d144 d145 d146 d147 d148 d149  
## 1 -2.246783 -2.281383 -2.322503 -2.293753 -2.122552 -2.321100  
## 2 -2.278939 -2.239722 -2.279183 -2.276290 -2.279183 -2.260095  
## 4 -2.259694 -2.257659 -2.259694 -2.259585 -2.259694 -2.022893  
## 5 -2.340895 -2.333223 -2.342028 -2.342028 -2.302598 -2.342028  
## 6 -2.210931 -2.210931 -2.210931 -2.210931 -2.210931 -2.210931  
## 7 -2.236061 -2.231261 -2.236061 -2.236061 -2.236061 -2.231650

## 'data.frame': 6357 obs. of 176 variables:  
## $ date\_year : int 2014 2014 2014 2013 2013 2014 2013 2013 2014 2014 ...  
## $ date\_month : int 7 11 6 1 10 11 9 5 6 6 ...  
## $ site\_name : int 11 2 2 2 2 2 2 2 2 2 ...  
## $ posa\_continent : int 3 3 3 3 3 3 3 3 3 3 ...  
## $ user\_location\_country : int 205 66 66 66 66 66 66 66 66 66 ...  
## $ user\_location\_region : int 354 462 314 174 149 447 184 174 189 314 ...  
## $ user\_location\_city : int 25315 49272 32759 46432 32073 33335 27733 27251 33796 16360 ...  
## $ orig\_destination\_distance: int 1632 2733 4171 2387 5198 7 2409 5034 1691 2278 ...  
## $ user\_id : int 6450 57017 102383 144246 165915 181701 183606 218025 227402 256238 ...  
## $ is\_mobile : int 0 1 0 0 0 0 0 0 0 0 ...  
## $ is\_package : int 1 0 0 1 0 0 0 0 1 0 ...  
## $ channel : int 5 9 9 9 9 9 9 9 1 0 ...  
## $ CheckIn\_year : int 2015 2014 2014 2013 2013 2014 2013 2013 2014 2014 ...  
## $ CheckIn\_month : int 2 11 7 4 12 11 12 6 12 7 ...  
## $ CheckOut\_year : int 2015 2014 2014 2013 2013 2014 2013 2013 2014 2014 ...  
## $ CheckOut\_month : int 2 11 8 4 12 11 12 6 12 7 ...  
## $ srch\_adults\_cnt : int 2 2 1 2 2 2 1 2 2 2 ...  
## $ srch\_children\_cnt : int 0 0 0 0 1 0 0 0 0 2 ...  
## $ srch\_rm\_cnt : int 1 1 1 1 1 1 1 1 1 1 ...  
## $ srch\_destination\_id : int 11938 8260 8739 48752 33390 12843 42293 25210 11938 21648 ...  
## $ srch\_destination\_type\_id : int 1 1 1 4 6 5 6 6 1 4 ...  
## $ is\_booking : int 0 0 0 0 0 0 0 0 0 0 ...  
## $ cnt : int 1 2 1 1 1 1 2 2 4 1 ...  
## $ hotel\_continent : int 4 2 6 4 6 2 2 6 4 2 ...  
## $ hotel\_country : int 8 50 144 8 105 50 50 31 8 50 ...  
## $ hotel\_market : int 126 701 4 110 12 661 649 1464 126 368 ...  
## $ hotel\_cluster : int 80 77 90 66 43 9 48 64 65 8 ...  
## $ d1 : num -2.07 -2.22 -2.22 -2.28 -2.21 ...  
## $ d2 : num -2.1 -2.28 -2.18 -2.34 -2.21 ...  
## $ d3 : num -2.29 -2.28 -2.25 -2.33 -2.21 ...  
## $ d4 : num -2.31 -2.24 -2.11 -2.34 -2.18 ...  
## $ d5 : num -2.28 -2.11 -1.99 -2.3 -2.11 ...  
## $ d6 : num -1.83 -1.79 -1.88 -1.86 -1.99 ...  
## $ d7 : num -2.32 -2.26 -2.26 -2.34 -2.21 ...  
## $ d8 : num -2.32 -2.25 -2.25 -2.32 -2.21 ...  
## $ d9 : num -1.42 -1.36 -2.23 -1.42 -2.21 ...  
## $ d10 : num -2.27 -2.25 -2.1 -2.31 -2.21 ...  
## $ d11 : num -2.21 -2.17 -2.09 -2.17 -2.16 ...  
## $ d12 : num -2.32 -2.28 -2.26 -2.34 -2.21 ...  
## $ d13 : num -2.05 -2.12 -2.12 -2.29 -2.21 ...  
## $ d14 : num -2.15 -2 -2.16 -2.25 -2.17 ...  
## $ d15 : num -2.32 -2.28 -2.26 -2.34 -2.21 ...  
## $ d16 : num -2.27 -1.98 -2.07 -2.25 -2.14 ...  
## $ d17 : num -2.3 -2.22 -2.14 -2.3 -2.19 ...  
## $ d18 : num -2.32 -2.27 -2.14 -2.25 -2.21 ...  
## $ d19 : num -2.32 -2.28 -2.26 -2.34 -2.21 ...  
## $ d20 : num -2.32 -2.27 -2.26 -2.33 -2.21 ...  
## $ d21 : num -2.32 -2.28 -2.19 -2.34 -2.21 ...  
## $ d22 : num -2.32 -2.28 -2.11 -2.34 -2.16 ...  
## $ d23 : num -2.32 -2.28 -2.26 -2.34 -2.21 ...  
## $ d24 : num -2.32 -2.26 -2.25 -2.28 -2.17 ...  
## $ d25 : num -2.32 -2.28 -2.26 -2.34 -2.21 ...  
## $ d26 : num -2.31 -2.27 -2.25 -2.34 -2.2 ...  
## $ d27 : num -2.32 -2.28 -2.08 -2.34 -2.09 ...  
## $ d28 : num -2.3 -2.25 -2.24 -2.26 -2.21 ...  
## $ d29 : num -2.23 -1.99 -2.1 -2.26 -2.11 ...  
## $ d30 : num -2.32 -2.25 -2.25 -2.31 -2.2 ...  
## $ d31 : num -2.07 -2.28 -2.26 -2.33 -2.21 ...  
## $ d32 : num -2.32 -2.28 -2.25 -2.34 -2.21 ...  
## $ d33 : num -2.32 -2.28 -2.26 -2.34 -2.21 ...  
## $ d34 : num -2.05 -2.27 -2.04 -2.31 -2.21 ...  
## $ d35 : num -2.17 -2.21 -2.1 -2.2 -2.21 ...  
## $ d36 : num -2.32 -2.28 -2.26 -2.34 -2.21 ...  
## $ d37 : num -1.55 -1.53 -1.71 -1.44 -1.8 ...  
## $ d38 : num -2.07 -2.24 -2.26 -2.3 -2.21 ...  
## $ d39 : num -2.07 -2.21 -2.26 -1.93 -2.21 ...  
## $ d40 : num -2.31 -2.27 -2.26 -2.34 -2.21 ...  
## $ d41 : num -1.95 -2.21 -2.11 -1.99 -2.21 ...  
## $ d42 : num -2.17 -2.28 -2.19 -2.04 -2.21 ...  
## $ d43 : num -1.92 -1.93 -2.01 -1.71 -2.01 ...  
## $ d44 : num -2.2 -2.28 -2.26 -2.28 -2.21 ...  
## $ d45 : num -2.32 -2.27 -2.14 -2.34 -2.21 ...  
## $ d46 : num -2.29 -2.24 -2.23 -2.33 -2.21 ...  
## $ d47 : num -2.21 -2.26 -2.26 -2.32 -2.21 ...  
## $ d48 : num -2.31 -2.28 -2.26 -2.3 -2.21 ...  
## $ d49 : num -1.46 -1.77 -2 -1.34 -1.91 ...  
## $ d50 : num -2.32 -2.26 -2.25 -2.34 -2.21 ...  
## $ d51 : num -2.31 -2.25 -2.19 -2.34 -2.21 ...  
## $ d52 : num -2.3 -2.26 -2.26 -2.34 -2.21 ...  
## $ d53 : num -2.21 -2.21 -2.03 -2.25 -2.08 ...  
## $ d54 : num -2.32 -2.28 -2.26 -2.34 -2.21 ...  
## $ d55 : num -2.15 -2.15 -2.23 -1.64 -2.2 ...  
## $ d56 : num -2.29 -2.26 -2.23 -2.34 -2.2 ...  
## $ d57 : num -2.32 -2.28 -2.2 -2.34 -2.19 ...  
## $ d58 : num -2 -2.16 -1.89 -2.23 -2.02 ...  
## $ d59 : num -2.32 -2.28 -2.25 -2.34 -2.21 ...  
## $ d60 : num -2.32 -2.28 -2.26 -2.34 -2.21 ...  
## $ d61 : num -2.32 -2.28 -2.26 -2.34 -2.21 ...  
## $ d62 : num -2.32 -2.28 -2.26 -2.34 -2.21 ...  
## $ d63 : num -2.32 -2.28 -2.26 -2.34 -2.21 ...  
## $ d64 : num -2.32 -2.28 -2.26 -2.34 -2.21 ...  
## $ d65 : num -2.32 -2.28 -2.26 -2.34 -2.21 ...  
## $ d66 : num -2.16 -2.24 -2.14 -2.32 -2.21 ...  
## $ d67 : num -2.32 -2.28 -2.26 -2.34 -2.21 ...  
## $ d68 : num -2.04 -2.26 -2.26 -2.28 -2.21 ...  
## $ d69 : num -2.26 -2.25 -2.26 -2.32 -2.21 ...  
## $ d70 : num -2.3 -2.28 -2.26 -2.34 -2.21 ...  
## $ d71 : num -2.32 -2.26 -2.2 -2.34 -2.21 ...  
## $ d72 : num -2.32 -2.27 -2.26 -2.34 -2.21 ...  
## [list output truncated]  
## - attr(\*, "na.action")= 'omit' Named int 3 92 153 383 451 598 1054 1140 1156 1403 ...  
## ..- attr(\*, "names")= chr "3" "92" "153" "383" ...