LA-2 Visualisation

Ankita and Asma

2022-07-02

```
data<-read.csv("C:/Users/DELL/OneDrive/Desktop/eda.csv",header=TRUE,sep=",")
```

```
data
```

```
##      match_id radiant_win freq_r win_pct_r duration_avg_win_r
## 1  5796599901       FALSE   29.8 0.6534193           32.09696
## 2  5796710768        TRUE   29.8 0.6534193           32.09696
## 3  4632569639       FALSE   12.2 0.1404762           30.07000
## 4  5080525118       FALSE   11.0 0.1818182           26.60000
## 5  5176256941        TRUE   42.2 0.4574555           34.08308
## 6  5989112142       FALSE   45.4 0.4193409           33.32407
## 7  5730717243       FALSE  170.6 0.5264108           33.64308
## 8  5113821481       FALSE    2.0 0.0000000                 NA
## 9  5628319228        TRUE  287.8 0.6203929           35.29406
## 10 5640928004        TRUE   65.4 0.6267639           37.35061
## 11 4897617647        TRUE   57.2 0.5237555           34.81627
## 12 5480282409        TRUE  159.2 0.4788596           34.40844
## 13 5114714358        TRUE   42.5 0.4687889           32.93283
## 14 4466830103        TRUE  106.6 0.5526349           34.91631
## 15 5640703973        TRUE  132.8 0.5097318           32.63575
## 16 6019971220        TRUE   56.2 0.5309129           36.97540
## 17 5300030235        TRUE   13.8 0.5118581           36.69451
## 18 5971206893        TRUE     NA        NA                 NA
## 19 5994879529        TRUE  222.0 0.4477352           33.73294
## 20 5224099864        TRUE   28.0 0.2258407           36.55568
## 21 5901414781        TRUE   29.2 0.5420033           36.01521
## 22 5987368876        TRUE   98.8 0.4508924           34.21427
## 23 5677418290        TRUE  178.4 0.5515661           34.77052
## 24 4891379575        TRUE  109.2 0.5641900           34.21306
## 25 5600467667        TRUE  140.6 0.4905469           26.66287
## 26 5440791356       FALSE  186.6 0.6526769           33.09384
## 27 5600992860       FALSE    2.5 0.2500000           27.83333
## 28 5340453463        TRUE   16.2 0.2719114           26.26127
## 29 4360290555        TRUE   46.8 0.5963535           35.38575
## 30 5139217248        TRUE   57.2 0.6140452           36.13098
## 31 6014646140       FALSE   88.6 0.5471228           31.58525
## 32 5060190446        TRUE   90.0 0.5321404           37.11181
## 33 4608178386       FALSE    7.2 0.1416667           41.50000
## 34 5874061480       FALSE   36.0 0.2851800           36.82669
## 35 5238975147        TRUE   85.6 0.5934145           36.81754
## 36 5729519479        TRUE  274.0 0.4525547           24.83468
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## 37 5369299134        TRUE  131.6 0.5091375          29.29403
## 38 5950073972        TRUE  198.0 0.3959385          32.82533
## 39 4347235141       FALSE    6.2 0.8380952          31.79556
## 40 5823758731        TRUE  134.0 0.5120051          37.23292
## 41 4593309564        TRUE   75.2 0.4830962          36.03718
## 42 6010520558       FALSE  163.4 0.4757318          32.13805
## 43 5777777395        TRUE     NA        NA                NA
## 44 4678695743        TRUE  135.6 0.5456963          36.85176
## 45 4919856642       FALSE   26.6 0.5338041          37.36698
## 46 5574110489        TRUE   23.6 0.7799331          29.03526
## 47 4623556133        TRUE    8.2 0.3707143          28.94750
## 48 4870534464       FALSE  176.0 0.6000000          35.47760
## 49 5418395979        TRUE  106.0 0.6295876          31.64839
## 50 5628456643       FALSE  288.0 0.5208333          25.02356
## 51 5581274533        TRUE  158.6 0.6353311          32.22441
## 52 5441823282        TRUE  120.8 0.5778040          36.37714
## 53 4401994907        TRUE    1.0 1.0000000          31.95000
## 54 4683207830        TRUE   18.2 0.6323300          36.36597
## 55 5092234458        TRUE   41.0 0.3534523          39.63583
## 56 5117977273       FALSE   76.0 0.5832234          38.22204
## 57 5405369398        TRUE   18.0 0.6111111          30.08333
## 58 4946806477        TRUE     NA        NA                NA
## 59 5877655195        TRUE   81.6 0.6241557          33.19382
## 60 5512371848       FALSE   95.0 0.3568355          33.23157
## 61 5141912737        TRUE  197.2 0.5597142          33.63962
## 62 4807632060       FALSE   38.0 0.5266667          31.37135
## 63 5278143666       FALSE   40.4 0.4460009          41.26471
## 64 5222672937        TRUE    4.0 0.7500000          29.01667
## 65 5138848511       FALSE   43.0 0.4375337          36.64620
## 66 4977309728        TRUE   37.0 0.5138544          37.16783
## 67 5723024440       FALSE   45.4 0.7371429          32.36690
## 68 6002473863       FALSE   95.8 0.2948403          36.47484
## 69 5161775909        TRUE   36.0 0.5000000          40.99630
## 70 6008406786       FALSE   85.8 0.5062445          33.46819
## 71 5481915530        TRUE   13.8 0.1965640          41.67315
## 72 5877781605        TRUE   70.8 0.4508239          35.34769
## 73 5596140059        TRUE  195.0 0.4666667          27.87179
## 74 5134130510        TRUE    7.0 0.1666667          26.44167
## 75 5254796003        TRUE  142.6 0.5643052          36.44053
## 76 5693264439        TRUE  133.6 0.5238949          37.04017
## 77 5683280528        TRUE  186.6 0.5777078          35.02384
## 78 5037916346        TRUE   87.8 0.4582993          34.36435
## 79 5328802719       FALSE   10.0 0.2772031          40.96167
## 80 5364053585        TRUE   27.5 0.7245372          29.49687
## 81 5714460100        TRUE  239.2 0.4113908          35.42402
## 82 5453918445        TRUE  136.2 0.5022336          36.44895
## 83 5826469616        TRUE   71.6 0.4478010          36.04587
## 84 5485483795        TRUE  261.0 0.4674330          29.01148
## 85 5413776697        TRUE  101.0 0.5407047          33.13694
## 86 5449813596       FALSE   74.2 0.4445639          32.58193
## 87 4823117410       FALSE   50.4 0.5157519          41.61598
## 88 5045191517       FALSE     NA        NA                NA
## 89 4955630841       FALSE   23.6 0.5948992          25.34776
## 90 5242654333       FALSE    3.0 1.0000000          26.53889
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```
## 91 4944287268        TRUE   32.2 0.5383834          37.99268
## 92 5229367193       FALSE  137.0 0.5328467          40.90571
## 93 5495184096       FALSE  132.6 0.4985569          36.57672
## 94 4872317348        TRUE  106.6 0.6271506          37.67871
## 95 5591952698        TRUE  131.2 0.5557551          34.76998
## 96 5919966201        TRUE   34.5 0.6228070          32.39154
## 97 5683389718        TRUE  256.4 0.5045965          24.90235
## 98 5466643854       FALSE  101.0 0.5049505          23.90588
## 99 5556432379       FALSE  183.6 0.5228538          28.26796
##    duration_avg_lose_r actions_per_min_avg_r ancient_kills_avg_r
## 1             40.58606              316.8472           6.7380148
## 2             40.58606              316.8472           6.7380148
## 3             41.73286              211.0746           5.5801587
## 4             27.47037              209.7455           2.8363636
## 5             31.86463                   NaN                 NaN
## 6             33.38017              254.5968           4.7940335
## 7             35.66973              282.9257           5.8467637
## 8             35.50000              122.5000           1.5000000
## 9             39.17398              235.6521           7.0475549
## 10            39.92489              263.9289           4.7161939
## 11            35.38061                   NaN                 NaN
## 12            34.43275              164.4252           7.5487252
## 13            41.41678              242.2746           1.8844178
## 14            36.29502                   NaN                 NaN
## 15            37.57946              225.1191           7.3188367
## 16            38.59437              180.3191           8.1546344
## 17            28.37649                   NaN                 NaN
## 18                  NA                    NA                  NA
## 19            34.06393                   NaN                 NaN
## 20            29.32287                   NaN                 NaN
## 21            29.05594              286.4950           6.1548440
## 22            34.31869                   NaN                 NaN
## 23            36.56583              235.5135           5.8958571
## 24            36.27793              278.9649           4.8231206
## 25            27.98546                   NaN                 NaN
## 26            37.50341                   NaN                 NaN
## 27            30.26042              213.3333           0.1666667
## 28            31.51014                   NaN                 NaN
## 29            35.47418              253.2849          11.3804929
## 30            39.68136                   NaN                 NaN
## 31            31.04065                   NaN                 NaN
## 32            38.05562              264.2459           5.8408687
## 33            30.40514              158.1417           3.3083333
## 34            34.79625              274.5261           4.9686066
## 35            40.54806                   NaN                 NaN
## 36            25.05744              183.1314           3.6175182
## 37            27.61938              200.0639           4.1650816
## 38            34.13660                   NaN                 NaN
## 39            19.08333              220.1619           8.0380952
## 40            38.22815              239.2531           2.4772126
## 41            33.92623              201.1142           3.3201434
## 42            36.65151              311.3689           5.8022409
## 43                  NA                    NA                  NA
## 44            38.52503                   NaN                 NaN
```

```
## 45          29.23944          204.9478          4.9754672
## 46          37.75833          315.3572          3.5344482
## 47          29.97950          181.7868          3.6725000
## 48          35.85875          307.9328          6.0530794
## 49          38.95772               NaN                NaN
## 50          23.86002               NaN                NaN
## 51          36.17849               NaN                NaN
## 52          34.97165               NaN                NaN
## 53                NA          172.0000          0.0000000
## 54          41.33917          199.3891          7.4506132
## 55          39.09162          283.1100          6.0741333
## 56          36.74842          334.1866          7.1740293
## 57          27.69762          205.4722          1.0000000
## 58                NA                NA                 NA
## 59          35.82975          267.4103          5.4033962
## 60          28.90058          258.0983          4.2034703
## 61          39.27421               NaN                NaN
## 62          32.88926               NaN                NaN
## 63          38.77805          266.9384          4.6469546
## 64          28.23333          243.9500          2.5500000
## 65          35.35029               NaN                NaN
## 66          37.70793          237.1855          3.7330389
## 67          37.77717          210.8995          7.4452381
## 68          33.59747               NaN                NaN
## 69          35.27130          181.2222          7.2777778
## 70          36.14235               NaN                NaN
## 71          35.75462          282.1646          4.9381886
## 72          33.32290               NaN                NaN
## 73          27.72933               NaN                NaN
## 74          32.79271          346.8125          2.2500000
## 75          36.17881               NaN                NaN
## 76          36.80197          230.9784          6.0743196
## 77          36.98955          178.1077          6.5448533
## 78          34.97960               NaN                NaN
## 79          30.14838               NaN                NaN
## 80          36.64028               NaN                NaN
## 81          34.39591          212.9155          5.2852064
## 82          36.83189               NaN                NaN
## 83          33.22034          284.9485          5.6173464
## 84          27.31751               NaN                NaN
## 85          35.51741               NaN                NaN
## 86          31.29450          190.4491          5.6023236
## 87          42.04452               NaN                NaN
## 88                NA                NA                 NA
## 89          32.89506          305.2255          4.2961012
## 90                NA          227.4667          3.2000000
## 91          30.44914          203.1431          3.9904445
## 92          37.82995          214.0117          8.4978102
## 93          36.55982          245.8239          4.5778979
## 94          40.51156          194.5986          7.8976951
## 95          38.63984          217.8450          5.0127452
## 96          38.23507          356.5066          0.2938596
## 97          24.97208               NaN                NaN
## 98          24.96633          182.0733          3.5326733
```

```
## 99            27.53402                  NaN                NaN
##    buyback_count_avg_r courier_kills_avg_r deaths_avg_r denies_avg_r
## 1            0.4672965          0.19419870     4.560102     7.198182
## 2            0.4672965          0.19419870     4.560102     7.198182
## 3            0.7865079          0.01111111     6.106349     9.161111
## 4            0.5454545          0.05454545     7.927273     7.236364
## 5                  NaN                 NaN     4.711898     8.863704
## 6            0.3359571          0.36797854     5.402652     7.523606
## 7            0.3737818          0.26256606     5.432516     7.655926
## 8            1.5000000          0.00000000    11.000000     0.500000
## 9            0.4745440          0.22621332     4.611322     8.297619
## 10           0.4383924          0.45991022     4.506559    10.215568
## 11                 NaN                 NaN     4.874027     9.432573
## 12           0.4273753          0.31105107     4.515245     8.657140
## 13           0.4331024          0.03132783     5.729958     5.589236
## 14                 NaN                 NaN     4.920789    10.756053
## 15           0.4065169          0.28826177     4.798605     8.731314
## 16           0.4874976          0.31075535     4.842100     7.416905
## 17                 NaN                 NaN     4.793277     9.753408
## 18                  NA                  NA           NA           NA
## 19                 NaN                 NaN     4.992730     6.141778
## 20                 NaN                 NaN     6.643301     6.846857
## 21           0.3506897          0.31088670     5.926962     6.327603
## 22                 NaN                 NaN     5.382724     6.469243
## 23           0.4755131          0.29131253     5.271816     8.294118
## 24           0.4284868          0.03838870     4.293531     8.379813
## 25                 NaN                 NaN     5.672643     2.636285
## 26                 NaN                 NaN     4.090174     9.063177
## 27           0.4166667          0.08333333     7.583333     8.333333
## 28                 NaN                 NaN     5.645688     9.236072
## 29           0.5173823          0.02532095     4.667953    11.035112
## 30                 NaN                 NaN     4.400872     8.783352
## 31                 NaN                 NaN     5.552068     6.937697
## 32           0.5374211          0.06189538     3.723037     9.695483
## 33           0.5666667          0.05000000     6.716667     8.916667
## 34           0.3921239          0.18057780     5.442621     6.766460
## 35                 NaN                 NaN     4.511010    10.056311
## 36           0.2145985          0.22992701     7.040146     5.533577
## 37           0.3969930          0.30226107     6.700769     7.549091
## 38                 NaN                 NaN     5.163855     6.162576
## 39           0.2666667          0.00000000     4.066667     9.561905
## 40           0.4368864          0.26357464     5.300653     5.402712
## 41           0.5118197          0.03762334     5.444394     7.115617
## 42           0.3981676          0.28767857     5.432494     6.004197
## 43                  NA                  NA           NA           NA
## 44                 NaN                 NaN     4.491780    10.475591
## 45           0.6616906          0.02991453     6.066493     9.567101
## 46           0.2876254          0.35418060     4.344147     7.634114
## 47           0.4446429          0.01250000     4.733929     8.568571
## 48           0.4770794          0.04107936     3.973397     9.072476
## 49                 NaN                 NaN     4.230302    10.848097
## 50                 NaN                 NaN     6.197222     6.544444
## 51                 NaN                 NaN     4.253422     8.452789
## 52                 NaN                 NaN     4.894941     8.866034
```

```
## 53          0.0000000          0.00000000     5.000000    11.000000
## 54          0.5596433          0.06369379     5.737421    13.241992
## 55          0.7477879          0.08460419     5.731768     8.443405
## 56          0.5773321          0.05705739     4.250385     9.238895
## 57          0.4027778          0.30555556     5.236111     7.236111
## 58                 NA                  NA           NA           NA
## 59          0.3475832          0.25817119     4.733212     6.436703
## 60          0.3249143          0.24589046     5.824076     7.849268
## 61                NaN                 NaN     4.914611     6.726673
## 62                NaN                 NaN     5.898333     8.005000
## 63          0.7244444          0.17117409     5.569141     7.549595
## 64          0.1500000          0.30000000     4.250000    10.200000
## 65                NaN                 NaN     5.167550     7.769449
## 66          0.6838856          0.00000000     6.084116     8.967957
## 67          0.4555952          0.33166667     4.866548     8.984286
## 68                NaN                 NaN     6.179951     5.517838
## 69          0.7055556          0.09444444     7.900000     8.400000
## 70                NaN                 NaN     5.131469     6.282365
## 71          0.6508590          0.33402428     7.093147     8.008366
## 72                NaN                 NaN     5.706797     6.676308
## 73                NaN                 NaN     5.831795     2.952821
## 74          0.4583333          0.00000000     7.770833     5.500000
## 75                NaN                 NaN     4.408638     8.682031
## 76          0.3959410          0.39059866     4.250547     8.845382
## 77          0.3757826          0.28925567     4.395416     8.203989
## 78                NaN                 NaN     4.044745     7.174889
## 79                NaN                 NaN     5.434291     6.955172
## 80                NaN                 NaN     4.844323     7.372977
## 81          0.2860077          0.30601351     5.795786     6.728283
## 82                NaN                 NaN     4.497297     9.984556
## 83          0.4205160          0.25915233     5.332555     8.218931
## 84                NaN                 NaN     6.508046     7.855172
## 85                NaN                 NaN     4.901164     7.588635
## 86          0.2137333          0.17579331     5.972048     4.436067
## 87                NaN                 NaN     6.575259    13.489240
## 88                 NA                  NA           NA           NA
## 89          0.3553514          0.06373205     5.472759     6.315406
## 90          0.0000000          0.26666667     2.000000    10.333333
## 91          0.6703988          0.03109848     6.154692     9.638278
## 92          0.4905109          0.14306569     6.995620     8.217518
## 93          0.3626502          0.32386722     4.560726     9.597612
## 94          0.6984654          0.04164751     4.195945     9.596300
## 95          0.4357026          0.36615230     4.676432     8.055816
## 96          0.5614035          0.12061403     5.247807     7.392544
## 97                NaN                 NaN     6.720130     5.652676
## 98          0.2198020          0.27722772     6.279208     6.615842
## 99                NaN                 NaN     5.298525     3.032302
##    firstblood_claimed_avg_r gold_avg_r gold_per_min_avg_r gold_spent_avg_r
## 1                0.11558934  2090.2111           435.5398        13093.804
## 2                0.11558934  2090.2111           435.5398        13093.804
## 3                0.05634921  1535.9135           422.1270        15254.440
## 4                0.12727273   929.4182           413.9455        10126.636
## 5                0.10742910  1800.7297           416.1454        12428.797
## 6                0.13694791  1444.2325           425.7679        12551.892
```

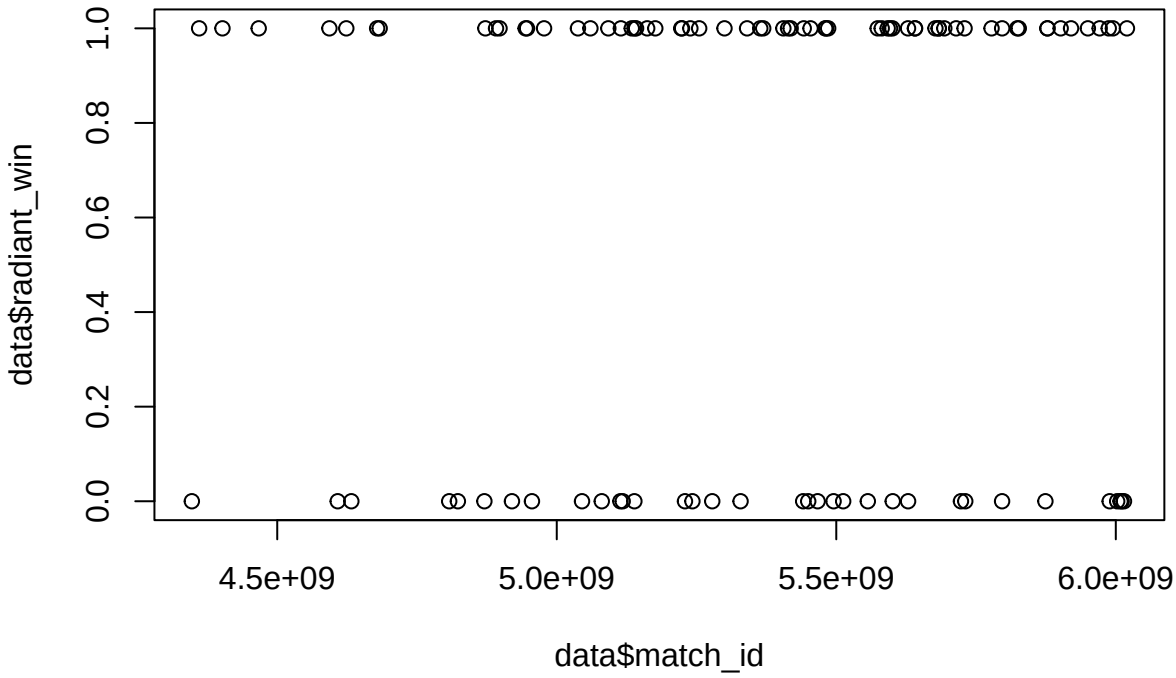
```
## 7          0.09569794  1618.6363          427.4632        13412.727
## 8          0.00000000   527.0000          220.0000         6742.500
## 9          0.10251900  1672.1302          429.1646        14101.707
## 10         0.13127817  2371.7296          421.8050        13802.910
## 11         0.17897263  1729.0566          428.4165        13413.870
## 12         0.09564238  1648.9903          415.1208        12748.162
## 13         0.42228362  1687.3979          357.8580        11078.859
## 14         0.08622230  1954.4311          451.0239        14328.762
## 15         0.10102421  1464.8855          413.3724        13081.620
## 16         0.09510196  1711.0999          451.8551        15534.202
## 17         0.04920635  1635.6442          410.1627        12542.228
## 18                 NA          NA                 NA               NA
## 19         0.09112719  1501.3084          407.8471        12416.358
## 20         0.08736299  1043.6715          378.2052        10831.799
## 21         0.07617406  1760.2718          449.8124        13611.084
## 22         0.09809828  1484.5191          426.9546        13010.368
## 23         0.09417488  1922.0471          411.1654        12643.136
## 24         0.10136461  1799.4364          427.2083        13521.287
## 25         0.09604260  1619.5032          436.7192        10214.750
## 26         0.09858093  1803.8093          418.2633        12814.944
## 27         0.08333333  1023.8333          352.0000         8851.667
## 28         0.02777778  1471.2618          382.0660        10707.909
## 29         0.11056559  1711.9166          441.8902        13824.018
## 30         0.10408576  1871.2691          490.2357        16852.468
## 31         0.05221851  1513.0887          449.3487        12652.336
## 32         0.13047398  2187.6270          489.7112        16457.884
## 33         0.12500000  1344.4167          343.8083         9400.375
## 34         0.11674400  1523.0306          374.7267        12123.478
## 35         0.10804968  2049.2248          447.0122        15352.271
## 36         0.09562044  1177.8285          439.2299         9810.526
## 37         0.09564103  1574.5207          443.2365        11001.013
## 38         0.09257760  1442.1170          402.1836        12168.689
## 39         0.09523809  2191.7286          455.8571        12377.643
## 40         0.10489600  1695.5643          383.1000        12682.923
## 41         0.09560921  1729.5553          381.9791        11613.391
## 42         0.09649860  1607.5835          412.2647        12663.903
## 43                 NA          NA                 NA               NA
## 44         0.10393110  2081.1323          439.9766        14421.420
## 45         0.09344488  1660.8480          421.3582        12600.596
## 46         0.12073579  1627.7271          410.2826        11436.139
## 47         0.09000000  1111.6879          399.2936        11094.623
## 48         0.09444444  2079.2982          446.3422        14017.647
## 49         0.09999960  1770.0267          415.1810        12553.060
## 50         0.10383275  1301.4708          428.4389         9354.003
## 51         0.10656904  1689.9589          410.0112        12282.646
## 52         0.09126665  1805.4340          424.2117        13475.872
## 53         0.00000000  2133.0000          431.0000        12610.000
## 54         0.09832776  2435.5651          513.1136        16954.374
## 55         0.14108149  1889.3937          423.5532        14388.423
## 56         0.09202686  2122.6653          451.2671        15193.948
## 57         0.09722222  1371.9444          372.4722         9717.569
## 58                 NA          NA                 NA               NA
## 59         0.09957069  1555.7924          429.3482        13234.662
## 60         0.08162142  1225.5809          379.3819        10692.766
```

```
## 61              0.10084930  1566.5555          455.6805        15111.928
## 62              0.08735632  1338.5800          428.4000        12426.567
## 63              0.06523617  1865.6477          409.3069        13795.302
## 64              0.15000000  1937.0000          431.1500        11081.250
## 65              0.05162493  1734.6509          422.0257        13620.439
## 66              0.06400667  1870.1505          442.1946        14443.436
## 67              0.11607143  1575.8081          458.2301        14328.414
## 68              0.10661651  1359.4224          391.8829        12134.441
## 69              0.08888889  1997.8667          484.1444        16499.278
## 70              0.09764717  1796.4940          426.8282        13040.587
## 71              0.06351074  1397.4143          369.4664        12202.891
## 72              0.12546674  1605.3151          403.5540        12586.020
## 73              0.09533679  1584.2595          425.9426        10329.697
## 74              0.00000000  1084.4375          355.0625        10147.188
## 75              0.11213853  1746.3211          432.6577        14357.338
## 76              0.10645274  2030.8174          438.2662        14355.728
## 77              0.10290504  1727.0768          433.3273        14189.027
## 78              0.11775903  1503.9732          431.2833        13354.991
## 79              0.10873016  1540.8057          369.4933        10783.404
## 80              0.11595216  1674.1048          450.0130        12744.547
## 81              0.08173703  1442.4293          406.8836        12777.843
## 82              0.09745057  1787.5919          415.5804        13781.669
## 83              0.08712531  1816.6788          412.0275        12754.590
## 84              0.11307692  1361.6874          430.1632        10732.962
## 85              0.13642899  1590.6302          410.1112        12598.400
## 86              0.08219178  1649.0599          420.9840        11656.190
## 87              0.09240837  2184.8947          522.5796        19181.332
## 88                      NA         NA                 NA               NA
## 89              0.13570166  1267.2660          455.3431        11735.782
## 90              0.00000000  1534.5333          448.8667        10993.667
## 91              0.09079974  1857.3110          431.6329        13117.170
## 92              0.09635036  2069.7679          512.5255        18240.182
## 93              0.06541434  1737.7961          416.1030        13654.257
## 94              0.12853196  1813.5462          458.8147        15991.868
## 95              0.10075881  1734.3070          408.3827        13099.044
## 96              0.08771930  1763.1886          371.4518        10830.636
## 97              0.09336512  1290.7507          440.8231         9755.707
## 98              0.09900990  1193.4475          417.0376         9077.455
## 99              0.09515420  1684.9287          423.2984        10212.566
##    hero_damage_avg_r hero_healing_avg_r hero_kills_avg_r
## 1           16241.17          1593.9560         5.283281
## 2           16241.17          1593.9560         5.283281
## 3           18990.02           530.8056         4.627778
## 4           17911.27           308.5455         5.781818
## 5           15314.71           733.5144              NaN
## 6           17031.04           779.8330         5.675387
## 7           17183.68           901.5848         5.648934
## 8            9898.50           200.0000         3.500000
## 9           19074.78          1249.9510         5.891800
## 10          19647.92          1234.8912         5.528579
## 11          16208.45           998.9974              NaN
## 12          16035.74           910.8228         4.387813
## 13          14207.74          1428.1513         3.672167
## 14          17224.89          1123.3245              NaN
```

```
## 15          16841.33          1210.8069         5.042040
## 16          19334.43          1123.2719         5.167810
## 17          18223.86           323.4545              NaN
## 18                NA                 NA               NA
## 19          16091.03           775.3407              NaN
## 20          14762.78           674.4580              NaN
## 21          18488.24           561.2931         6.459097
## 22          15947.49           887.0524              NaN
## 23          16807.31          1046.7079         5.161955
## 24          16160.07           902.1901         4.757202
## 25          14000.74           536.3279              NaN
## 26          16812.29          1314.0239              NaN
## 27          12385.42           268.4167         5.416667
## 28          15822.25           927.7343              NaN
## 29          15936.80           940.8772         4.837244
## 30          19591.03          1124.0332              NaN
## 31          19219.66           846.4000              NaN
## 32          19981.07           844.8126         5.915651
## 33          13983.50           500.6000         4.450000
## 34          15691.31           750.9585         4.279910
## 35          19050.64          1677.8267              NaN
## 36          15503.75           342.5168         6.530657
## 37          18689.87           823.3236         6.450699
## 38          15702.20           777.0462              NaN
## 39          15982.98          1572.4810         6.357143
## 40          16855.41           958.6250         4.444848
## 41          14577.80          1113.6222         4.144631
## 42          18066.07           802.4899         5.197132
## 43                NA                 NA               NA
## 44          16356.37          1114.6276              NaN
## 45          16859.77           783.6677         5.520382
## 46          17085.22          1861.6124         6.482609
## 47          13326.99           637.5864         4.377143
## 48          15610.14           930.9312         4.628063
## 49          15566.63          1141.2163              NaN
## 50          14821.73           523.6417              NaN
## 51          16611.37          1150.6876              NaN
## 52          17648.58          1190.3431              NaN
## 53          21680.00           200.0000         9.000000
## 54          25939.79          1252.6274         9.106503
## 55          18048.47           932.6884         5.135491
## 56          18871.57          1035.0474         5.081123
## 57          14287.68          1379.4583         4.805556
## 58                NA                 NA               NA
## 59          17083.59          1397.2984         5.514407
## 60          15144.66           702.5446         4.440337
## 61          18267.29           742.8161              NaN
## 62          15619.02           759.1717              NaN
## 63          18385.15           959.1142         4.950967
## 64          15224.60           948.9000         5.900000
## 65          17691.05           898.4615              NaN
## 66          19243.15          1203.7867         5.888303
## 67          18042.65          1292.3196         6.104524
## 68          16331.15           910.5925              NaN
```

```
## 69          26004.74           586.7500         7.411111
## 70          18097.02           712.6506              NaN
## 71          16350.82          1100.8320         4.296816
## 72          16902.89           661.8366              NaN
## 73          14046.09           483.8185              NaN
## 74          19426.33           737.4583         5.500000
## 75          16855.53           943.5258              NaN
## 76          19411.02           978.4958         5.739360
## 77          16564.53          1008.2316         4.719688
## 78          15224.89           737.6219              NaN
## 79          15118.07           845.7343              NaN
## 80          19294.37           606.7979              NaN
## 81          16864.06           862.6804         4.952054
## 82          16317.55           868.2011              NaN
## 83          17174.82          1210.8549         5.008575
## 84          17519.67           680.0828              NaN
## 85          15917.47           911.2173              NaN
## 86          15809.98           463.7105         5.536327
## 87          31995.28           901.0576              NaN
## 88                NA                 NA               NA
## 89          15754.98          1144.3062         5.506301
## 90          15070.60           777.7333         6.200000
## 91          18545.15          1008.3074         5.858468
## 92          23825.75           544.4847         7.040876
## 93          17264.51          1260.0623         4.935961
## 94          17134.89          1458.2781         5.063132
## 95          17641.92           866.4152         5.199240
## 96          15003.80          1574.9934         4.179825
## 97          15044.31           427.0143              NaN
## 98          15054.09           606.1465         6.164356
## 99          14213.22           571.6321              NaN
```

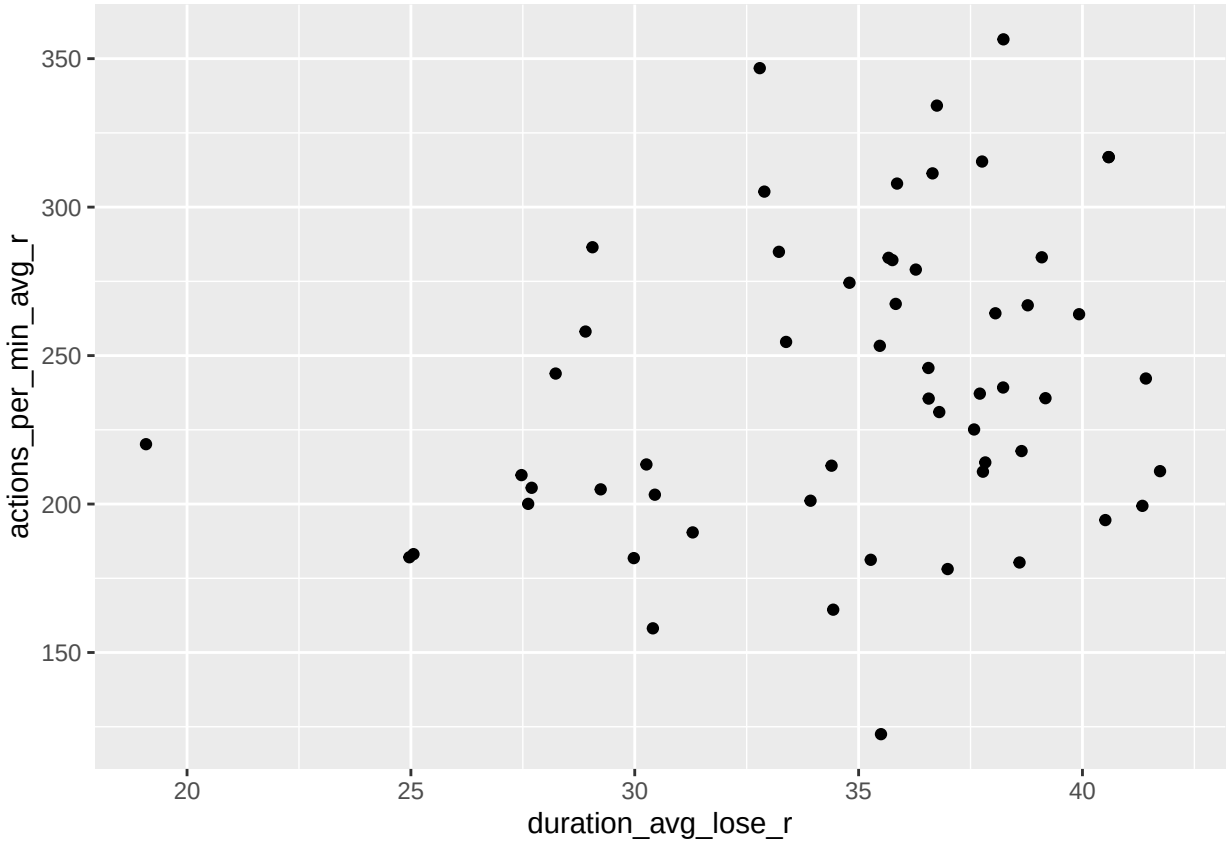
```
plot(data$match_id,data$radiant_win)
```



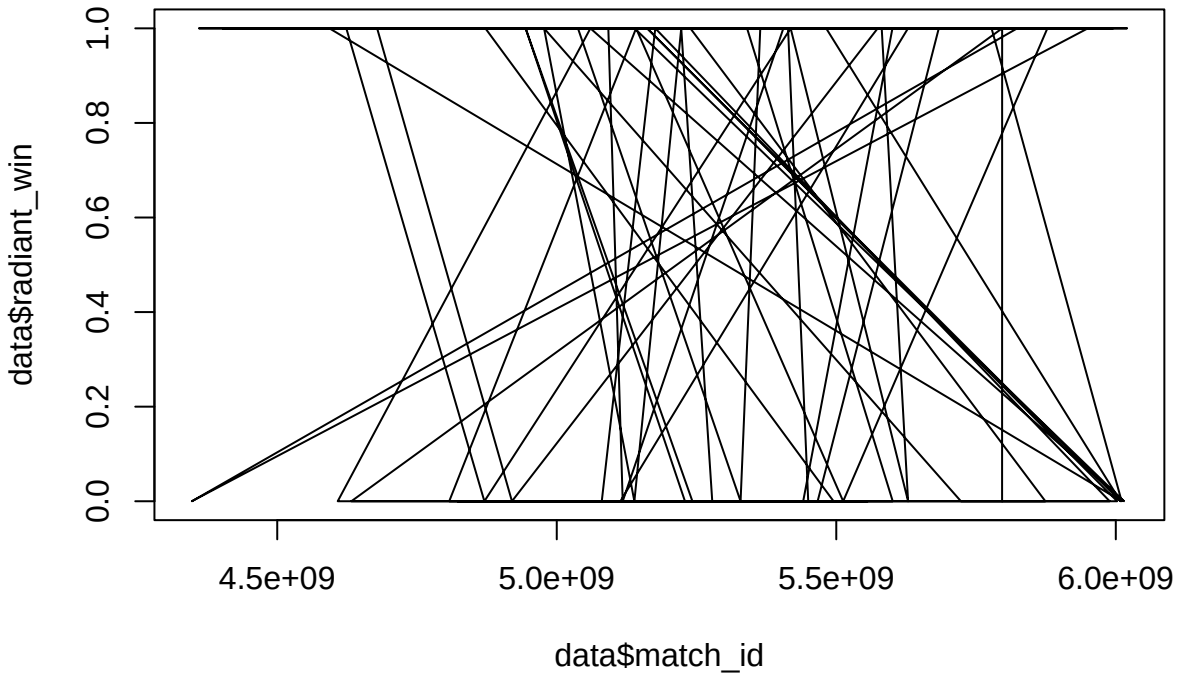

```
library(ggplot2)
```

```
ggplot(data,aes(x=duration_avg_lose_r,y=actions_per_min_avg_r))+geom_point()
```

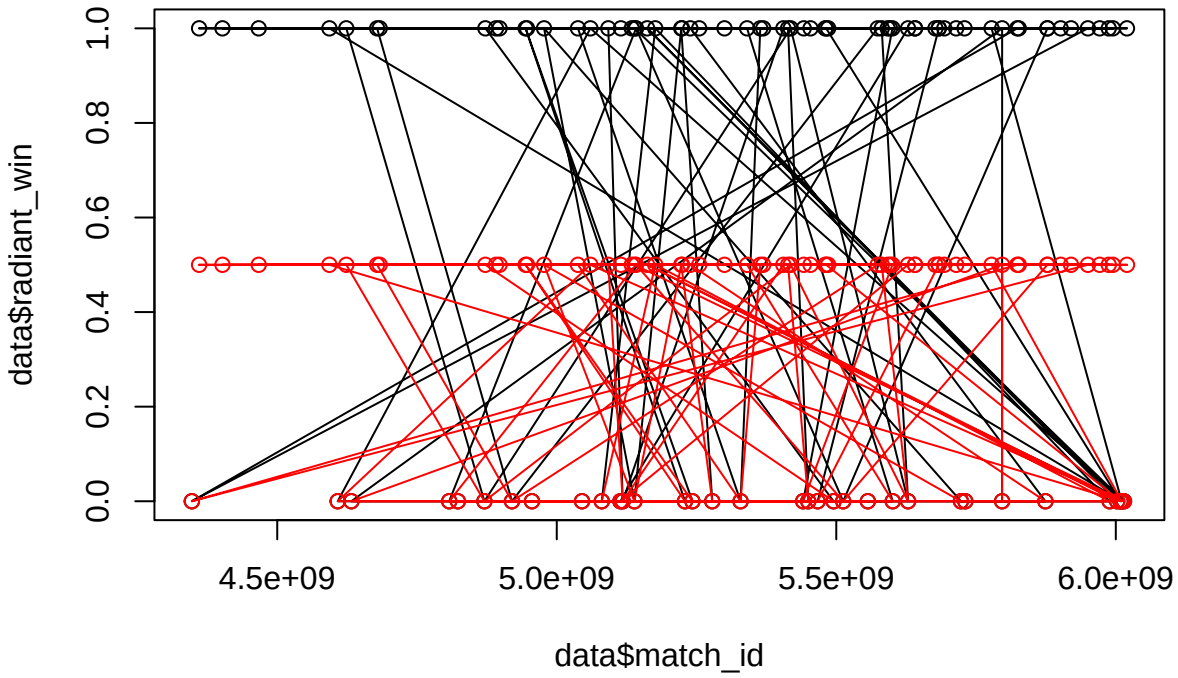
```
## Warning: Removed 42 rows containing missing values (geom_point).
```




```
plot(data$match_id,data$radiant_win,type="l")
```

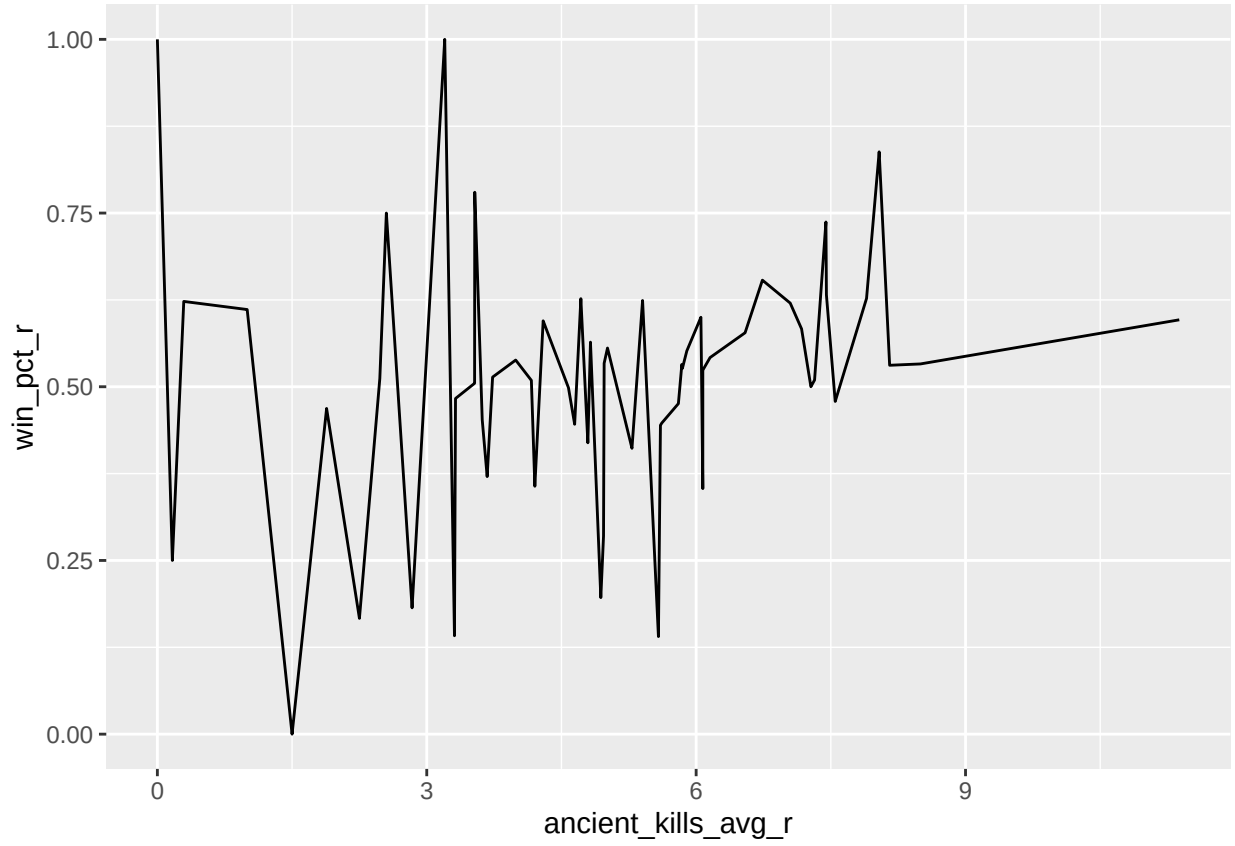



```
plot(data$match_id,data$radiant_win,type="l")
points(data$match_id,data$radiant_win)
lines(data$match_id,data$radiant_win/2,col="red")
points(data$match_id,data$radiant_win/2,col="red")
```




```
ggplot(data,aes(x=ancient_kills_avg_r,y=win_pct_r))+geom_line()
```

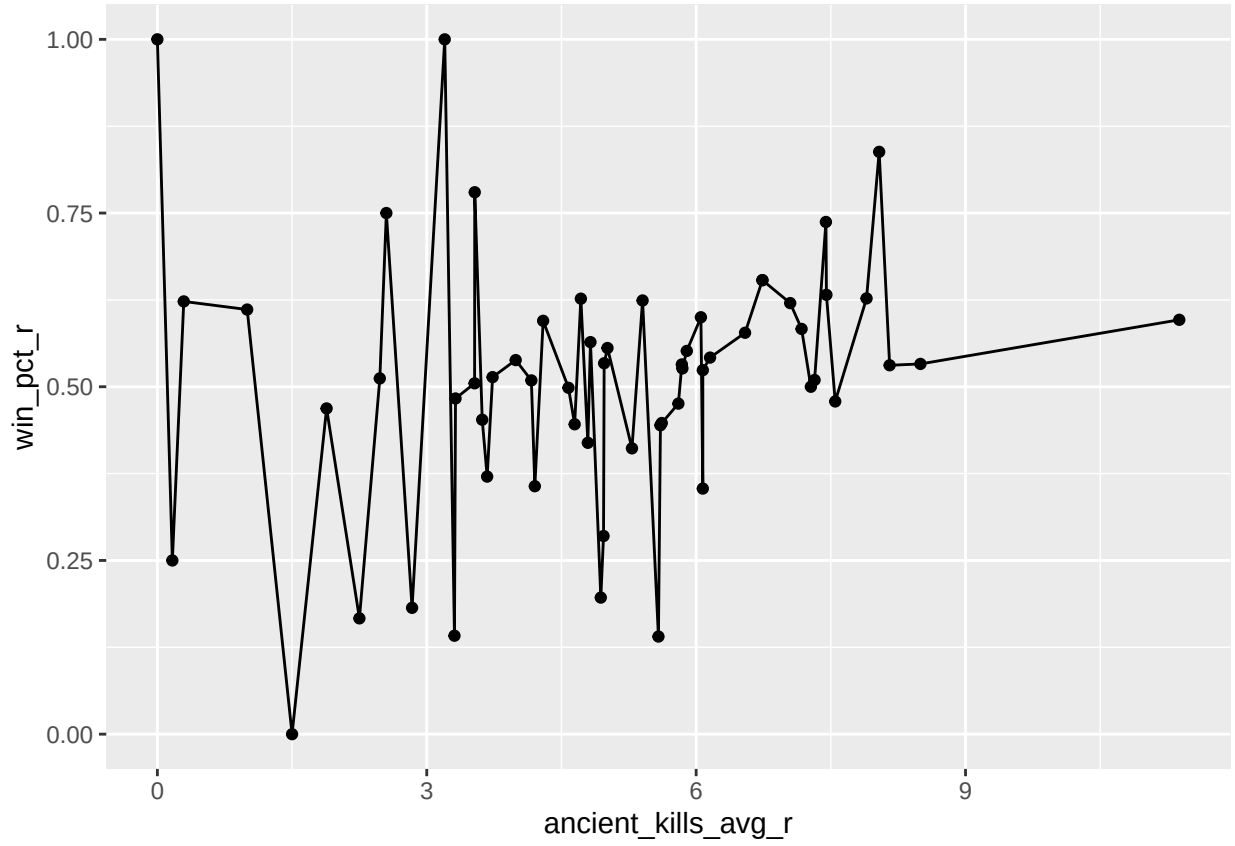
```
## Warning: Removed 40 row(s) containing missing values (geom_path).
```




```
ggplot(data,aes(x=ancient_kills_avg_r,y=win_pct_r))+geom_line()+geom_point()
```

```
## Warning: Removed 40 row(s) containing missing values (geom_path).
```

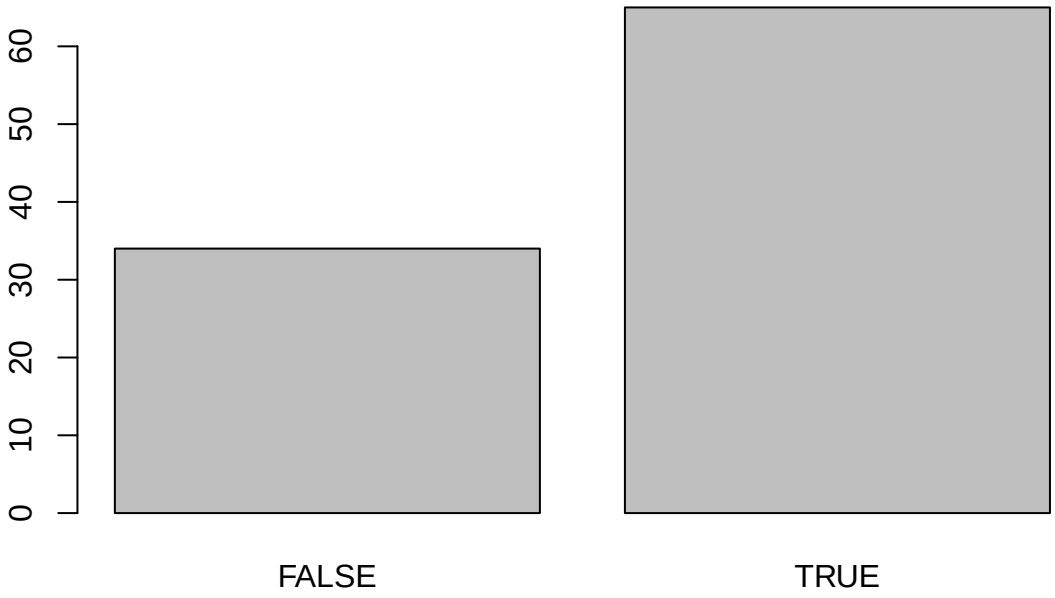
```
## Warning: Removed 40 rows containing missing values (geom_point).
```




```
table(data$radiant_win)
```

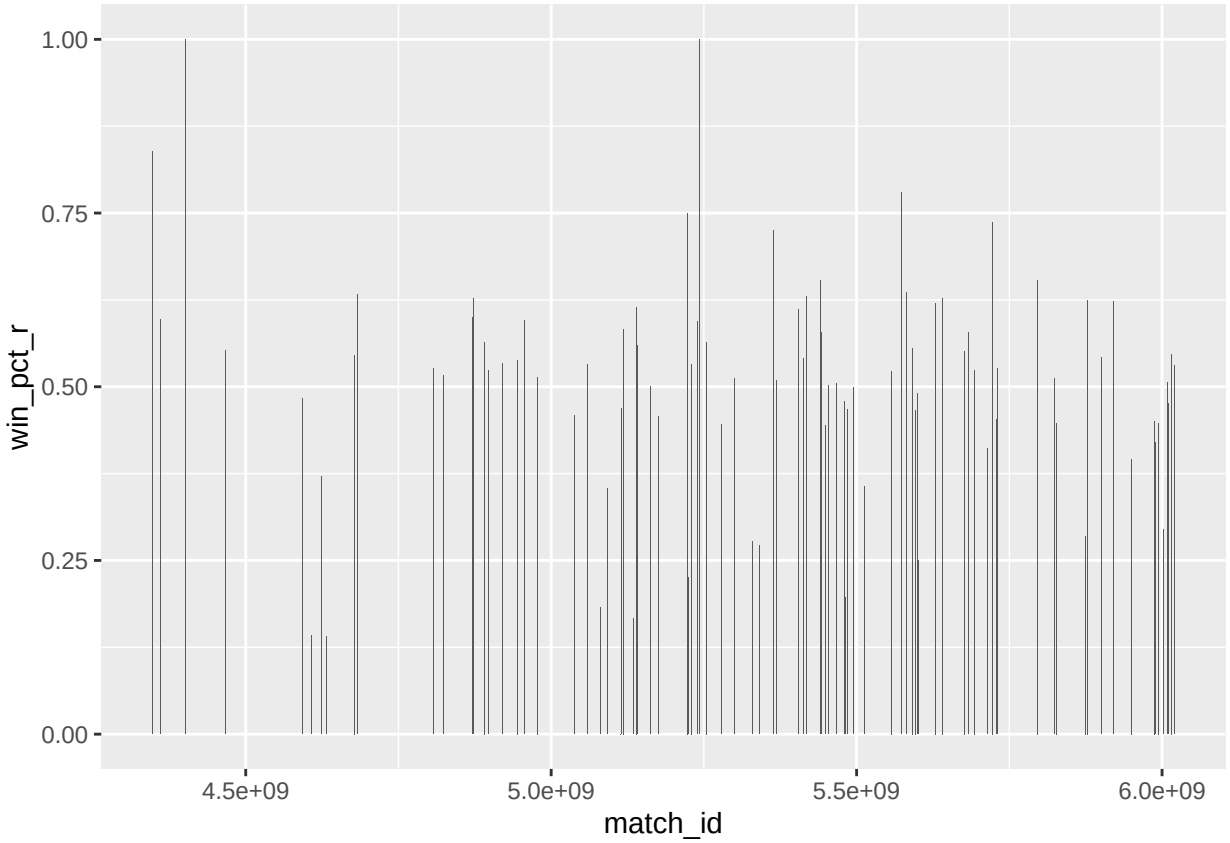
```
##
## FALSE  TRUE
##    34    65
```

```
barplot(table(data$radiant_win))
```

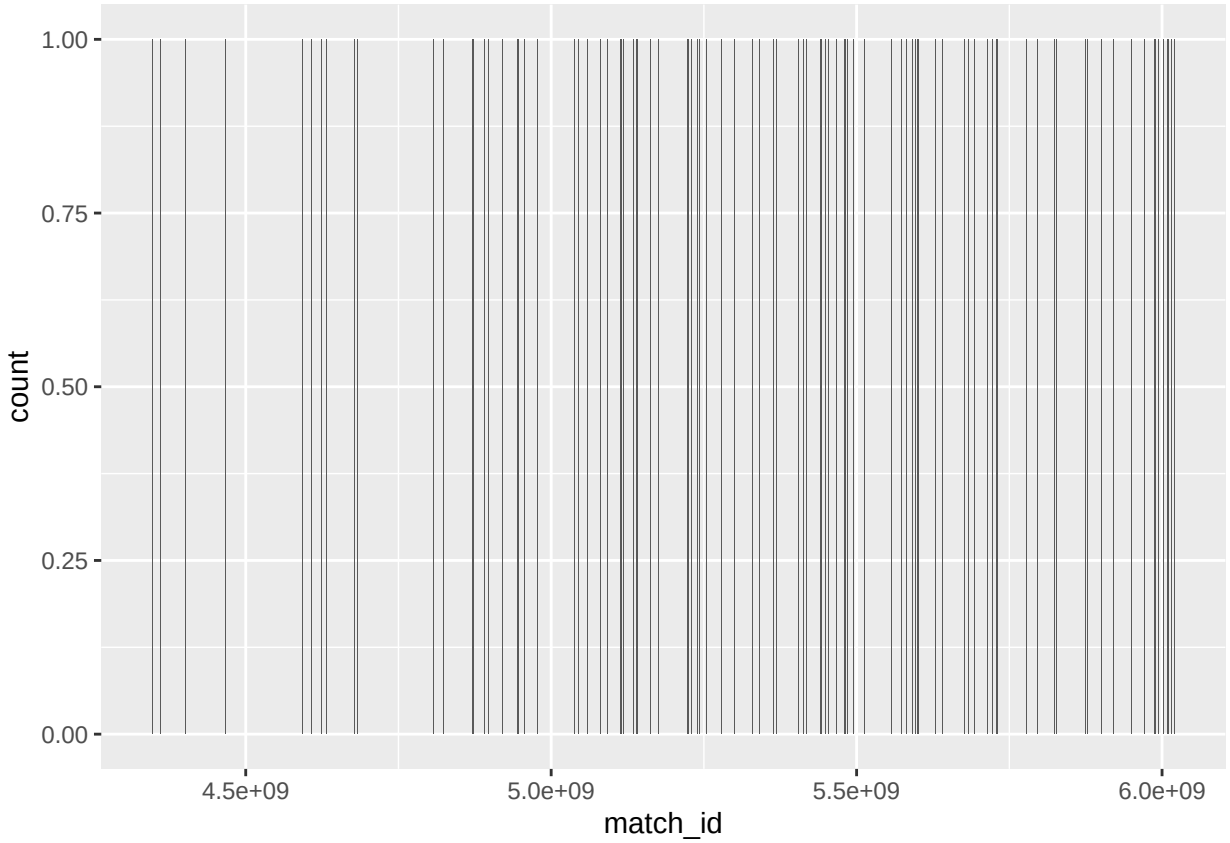



```
ggplot(data,aes(x=match_id,y=win_pct_r))+geom_col()
```

```
## Warning: Removed 4 rows containing missing values (position_stack).
```

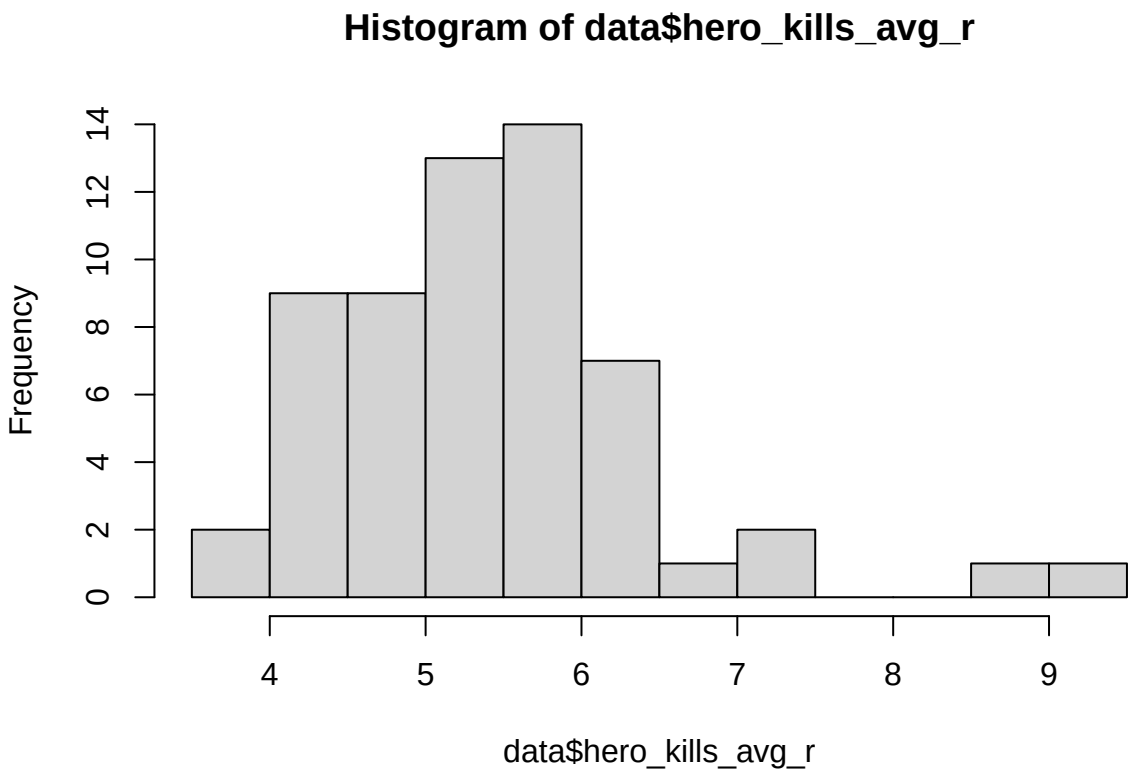



```
ggplot(data,aes(x=match_id))+geom_bar()
```



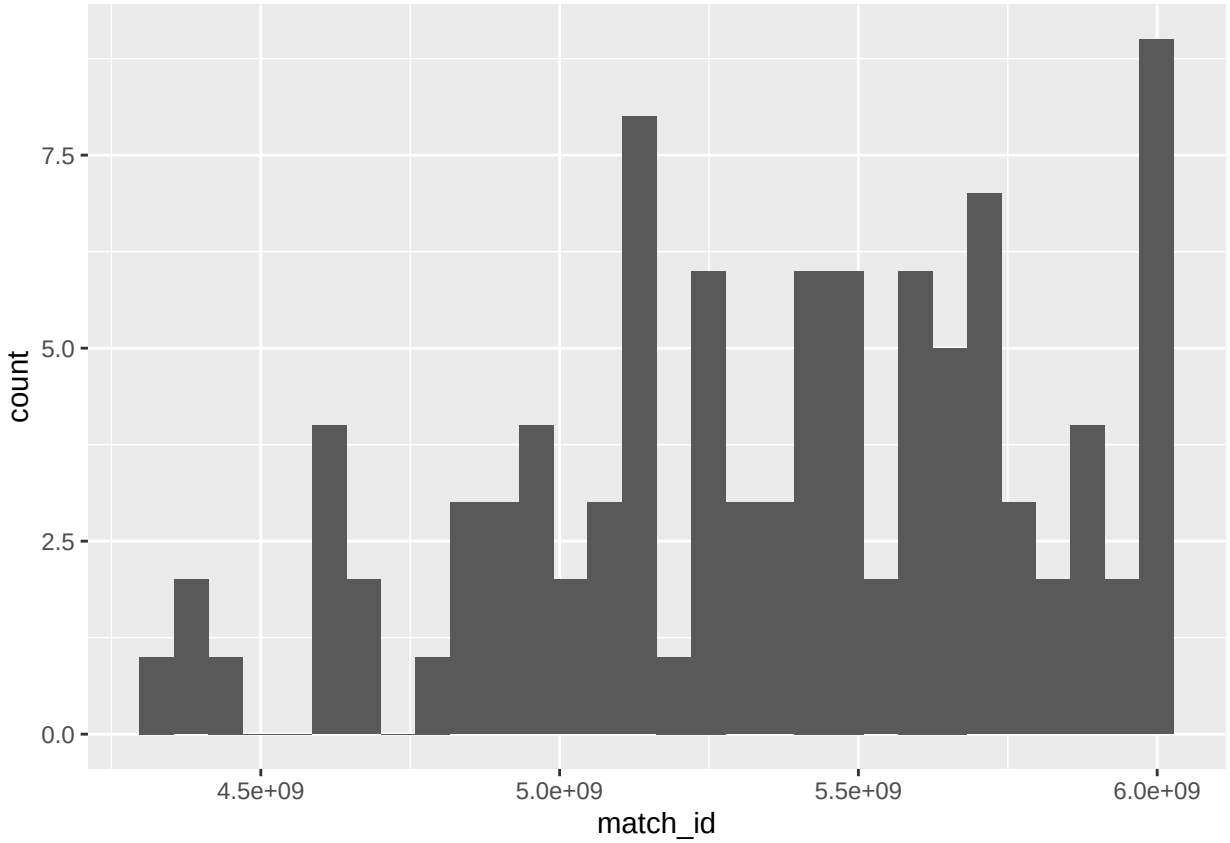

```
hist(data$hero_kills_avg_r)
```


```
hist(data$hero_kills_avg_r,breaks=10)
```




```
ggplot(data,aes(x=match_id))+geom_histogram()
```

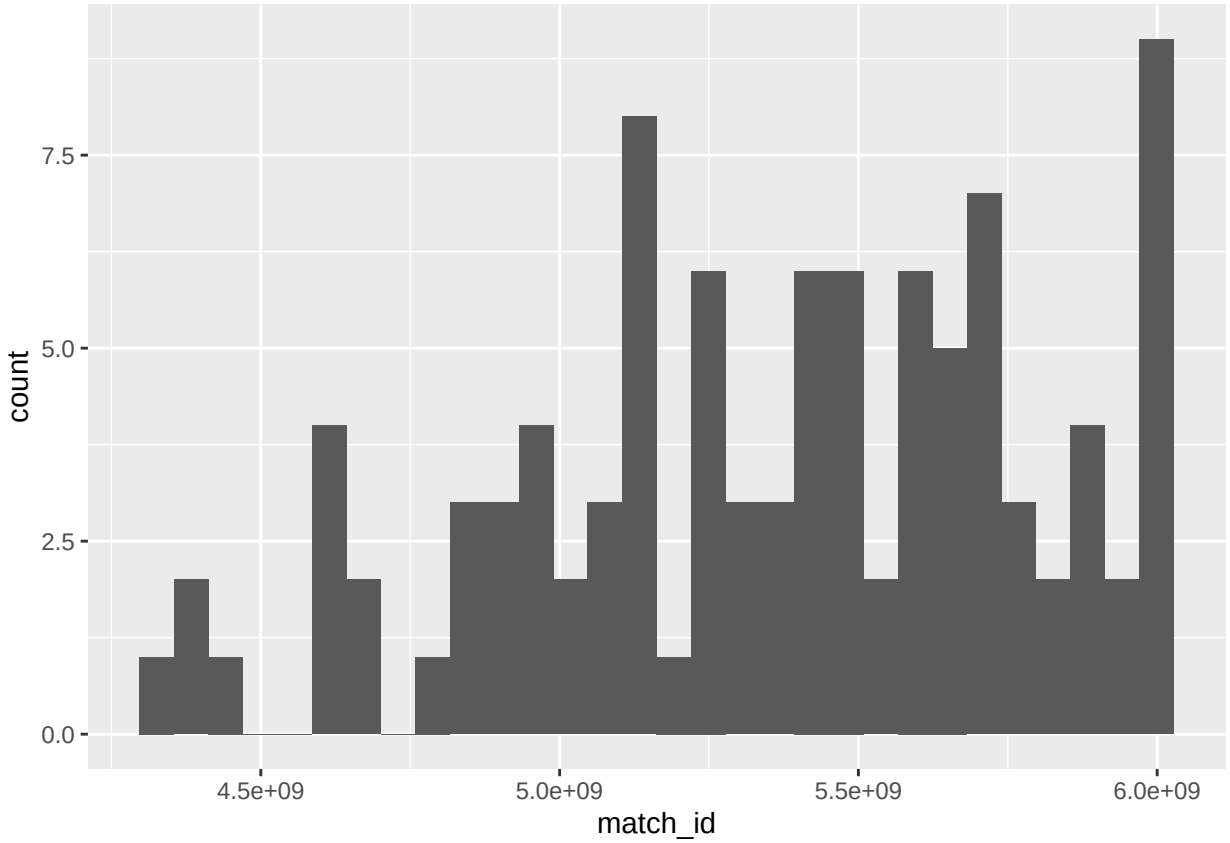
```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



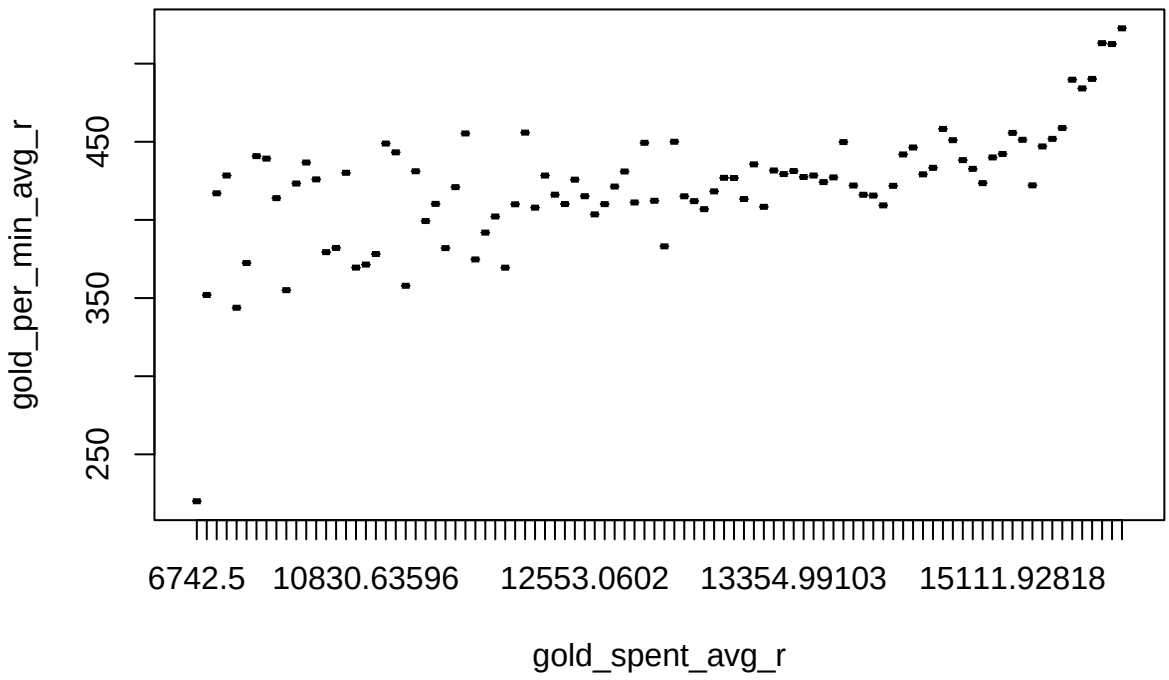

```
ggplot(data,aes(x=match_id))+geom_histogram(bandwidth=4)
```

```
## Warning: Ignoring unknown parameters: bandwidth
```

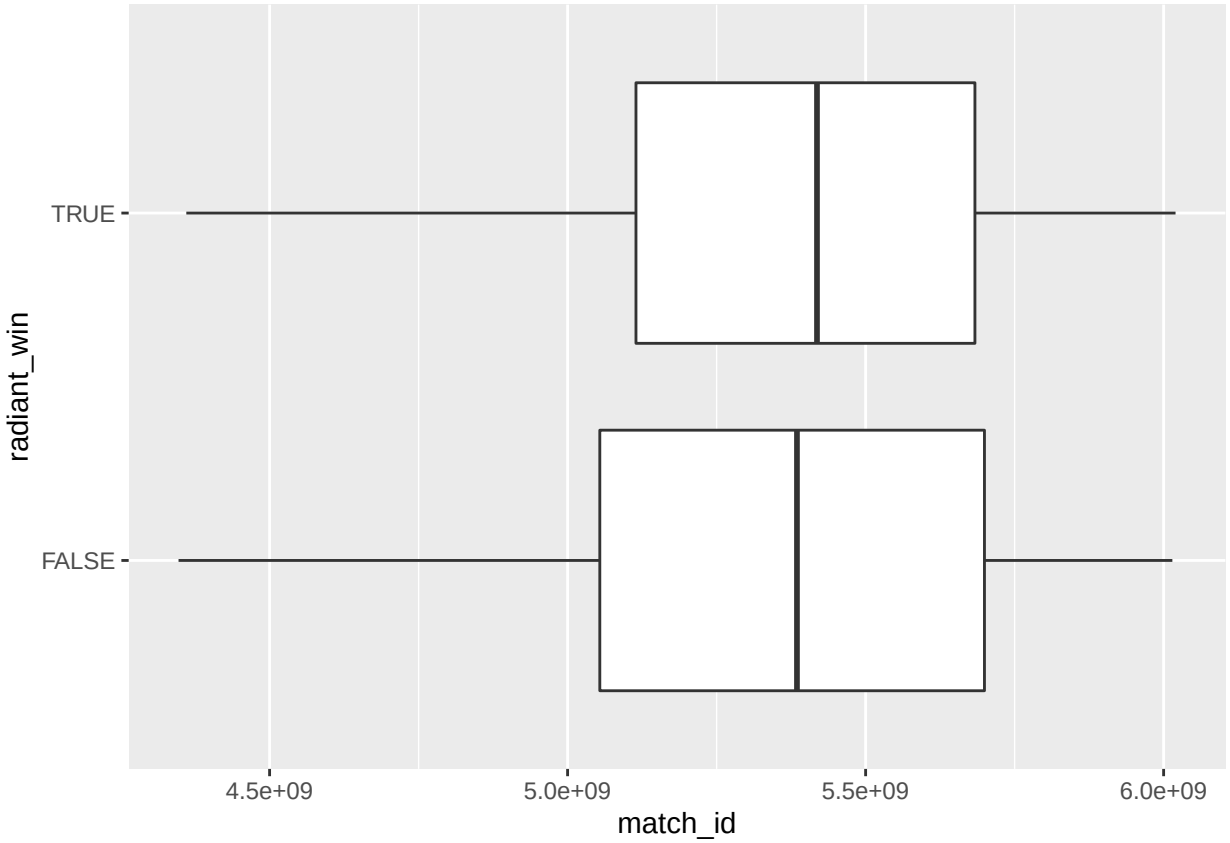
```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



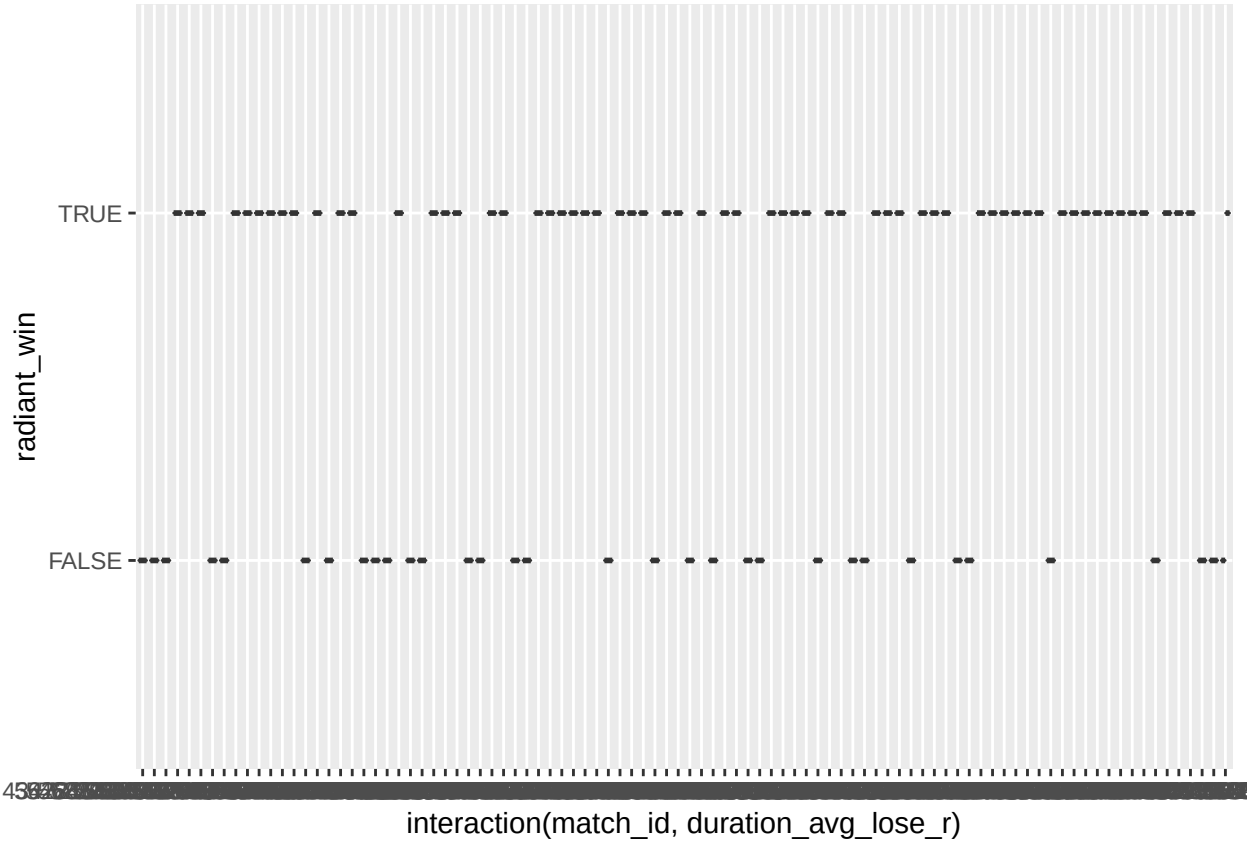

```
boxplot(gold_per_min_avg_r ~ gold_spent_avg_r,data)
```



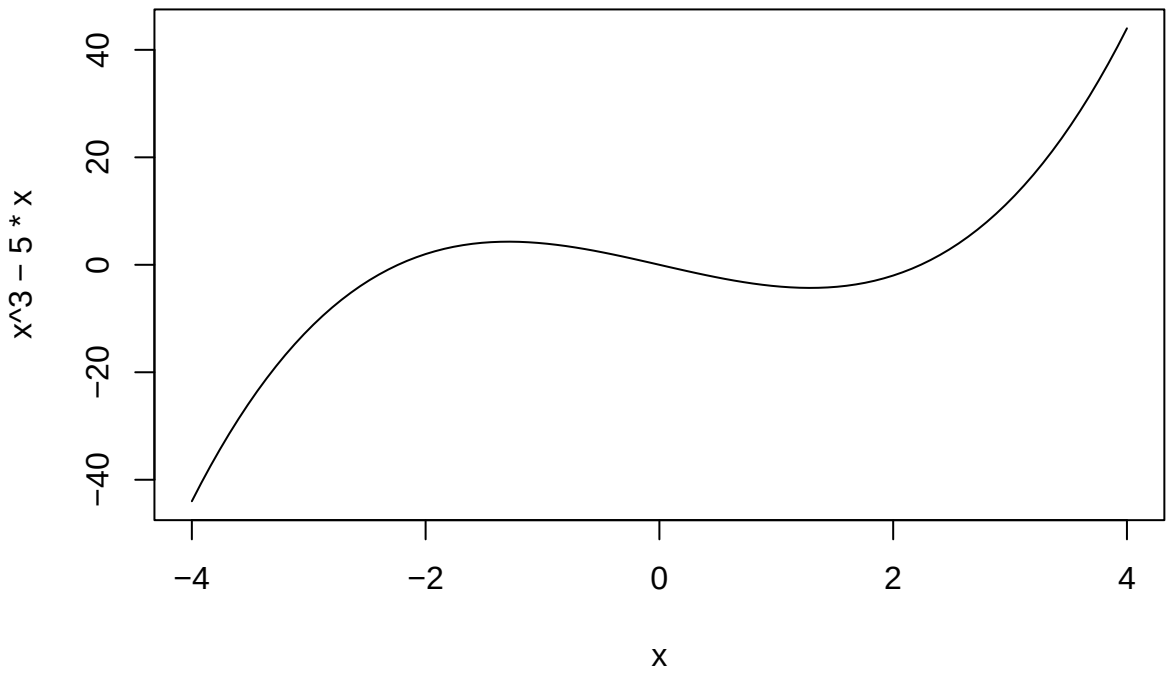

```
ggplot(data,aes(x=match_id,y=radiant_win))+geom_boxplot()
```



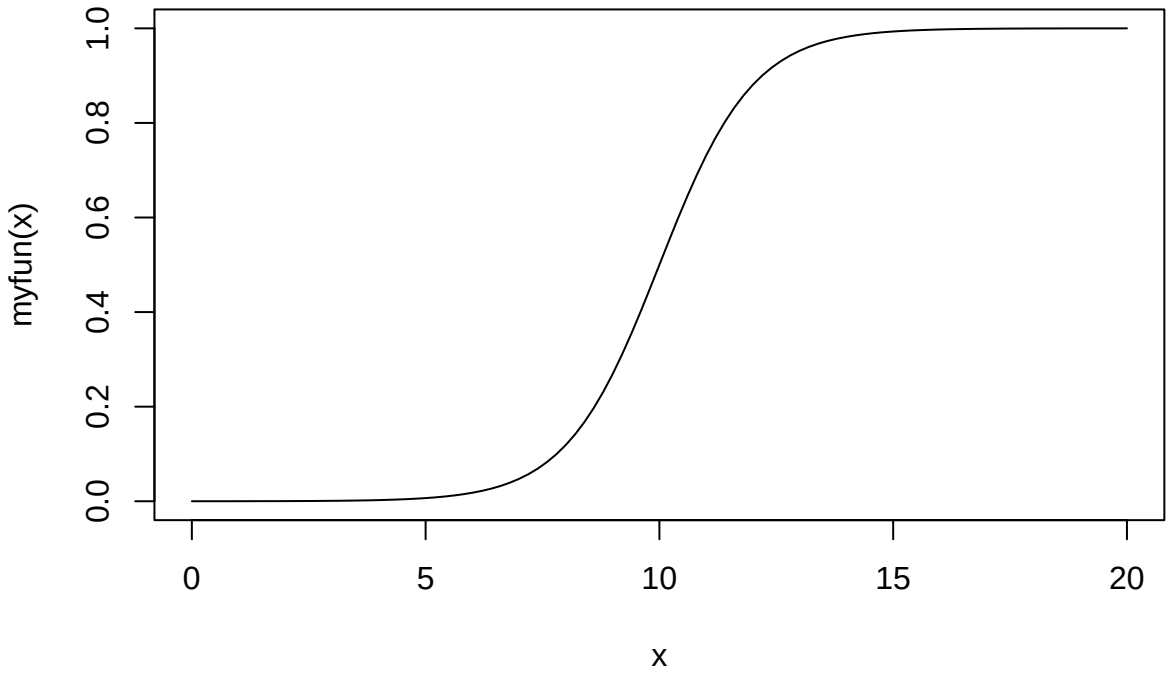

```
ggplot(data,aes(x=interaction(match_id,duration_avg_lose_r),y=radiant_win))+geom_boxplot()
```



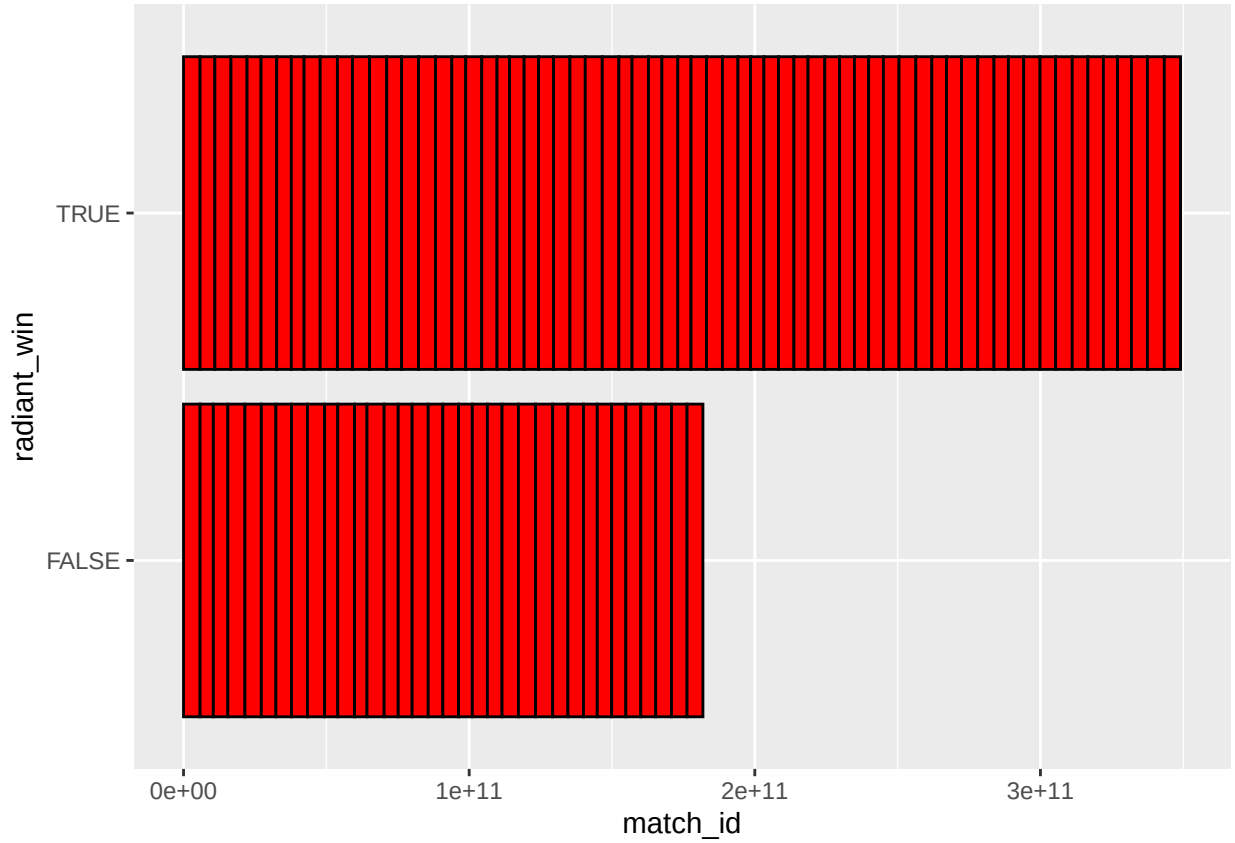

```
curve(x^3-5*x,from = -4, to = 4)
```



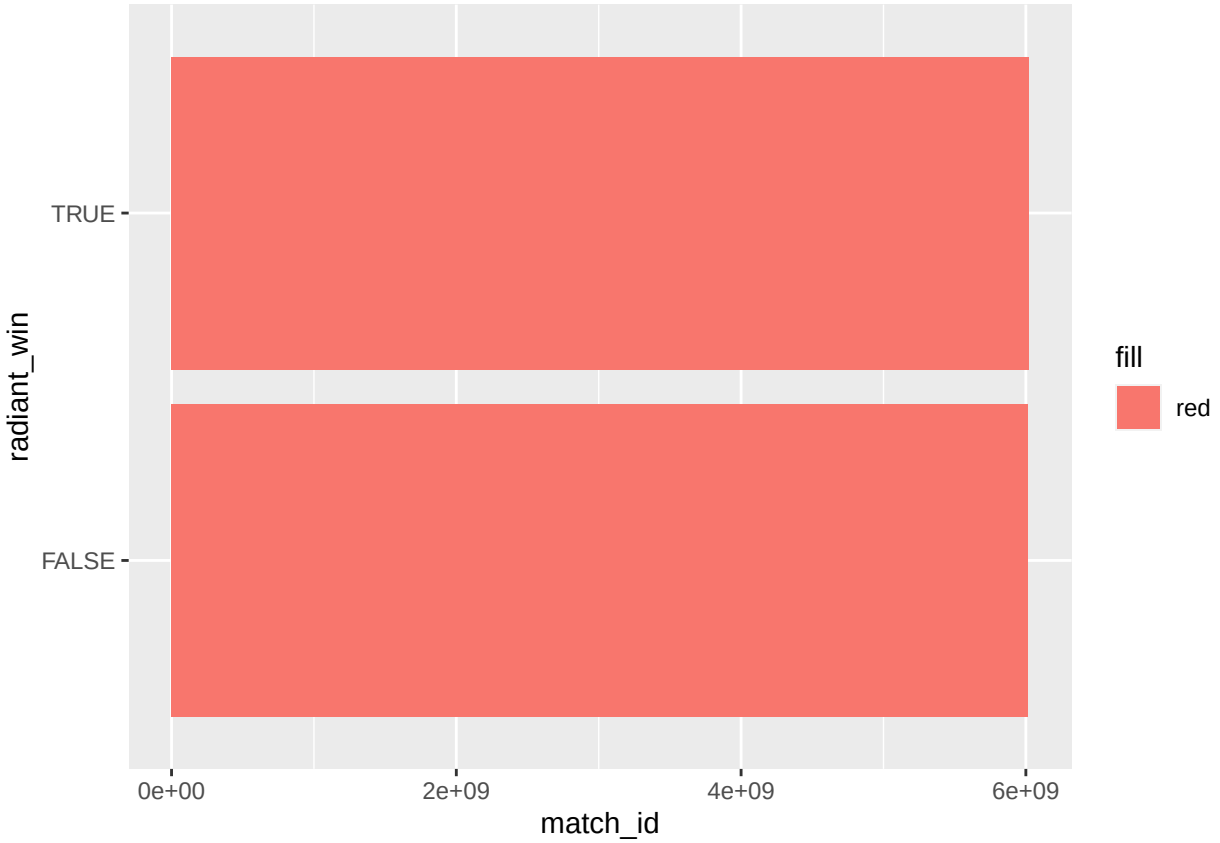

```
myfun <- function(xvar) {
 1 / (1 + exp(-xvar + 10))
}
curve(myfun(x), from = 0, to = 20)
```




```
ggplot(data,aes(x=match_id,y=radiant_win))+geom_col(fill="red",colour="black")
```

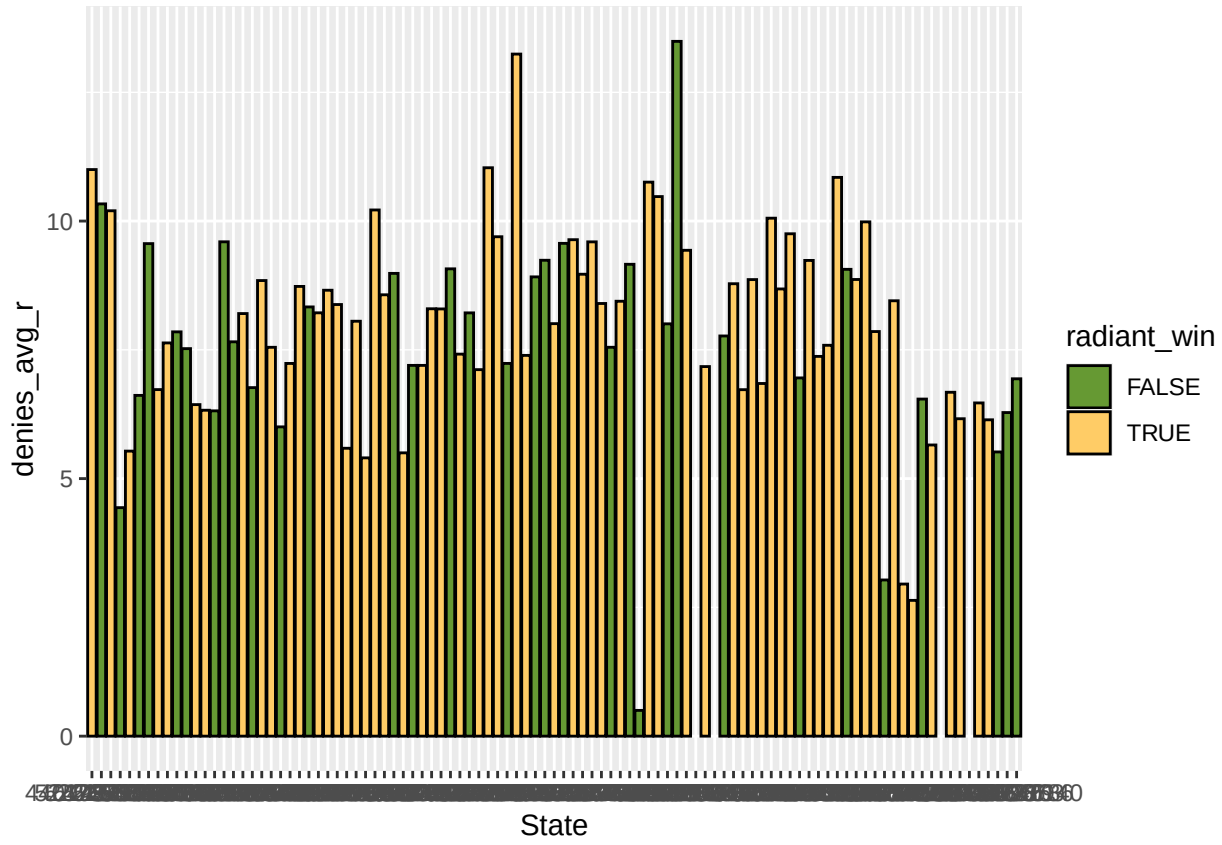



```
ggplot(data,aes(x=match_id,y=radiant_win,fill="red"))+geom_col(position="dodge")
```



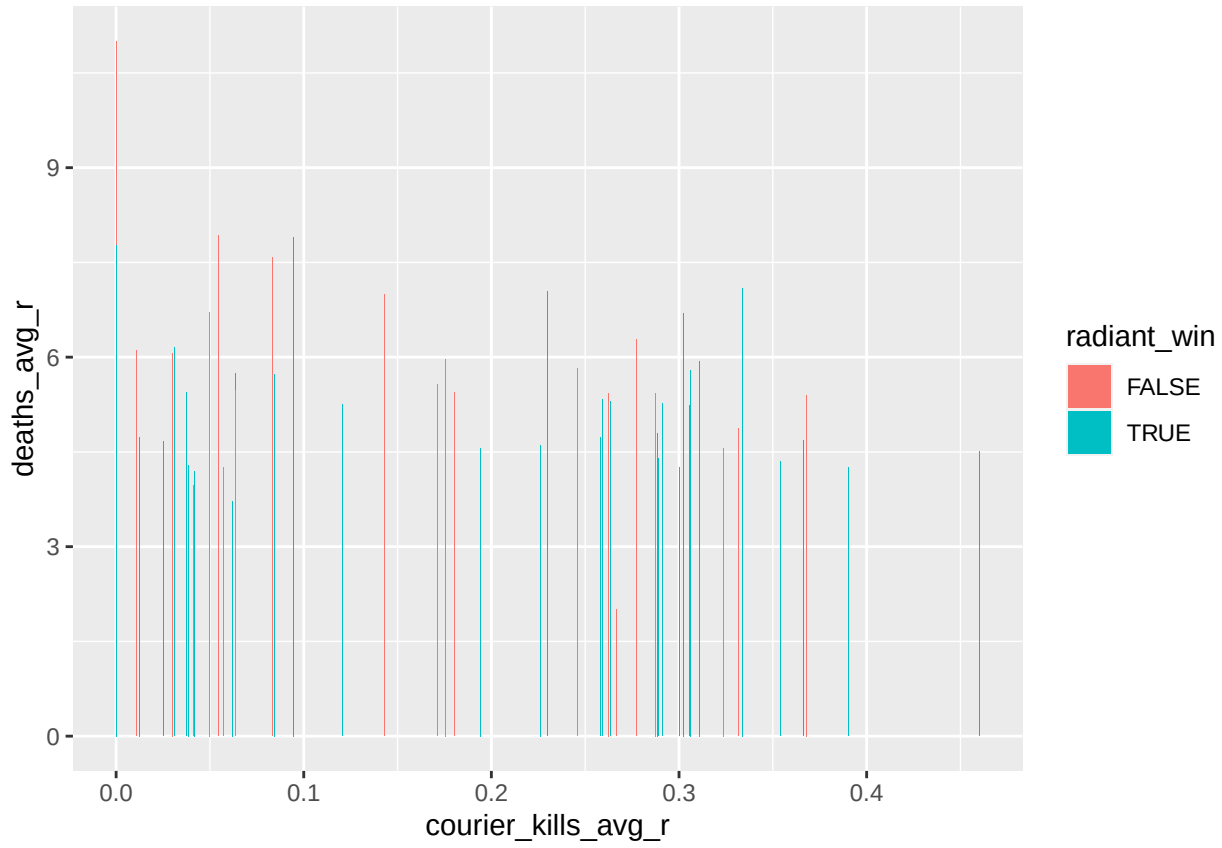

```
ggplot(data, aes(x = reorder(match_id,buyback_count_avg_r), y = denies_avg_r, fill = radiant_win)) +
 geom_col(colour = "black") +
 scale_fill_manual(values = c("#669933", "#FFCC66")) +
 xlab("State")
```

```
## Warning: Removed 4 rows containing missing values (position_stack).
```



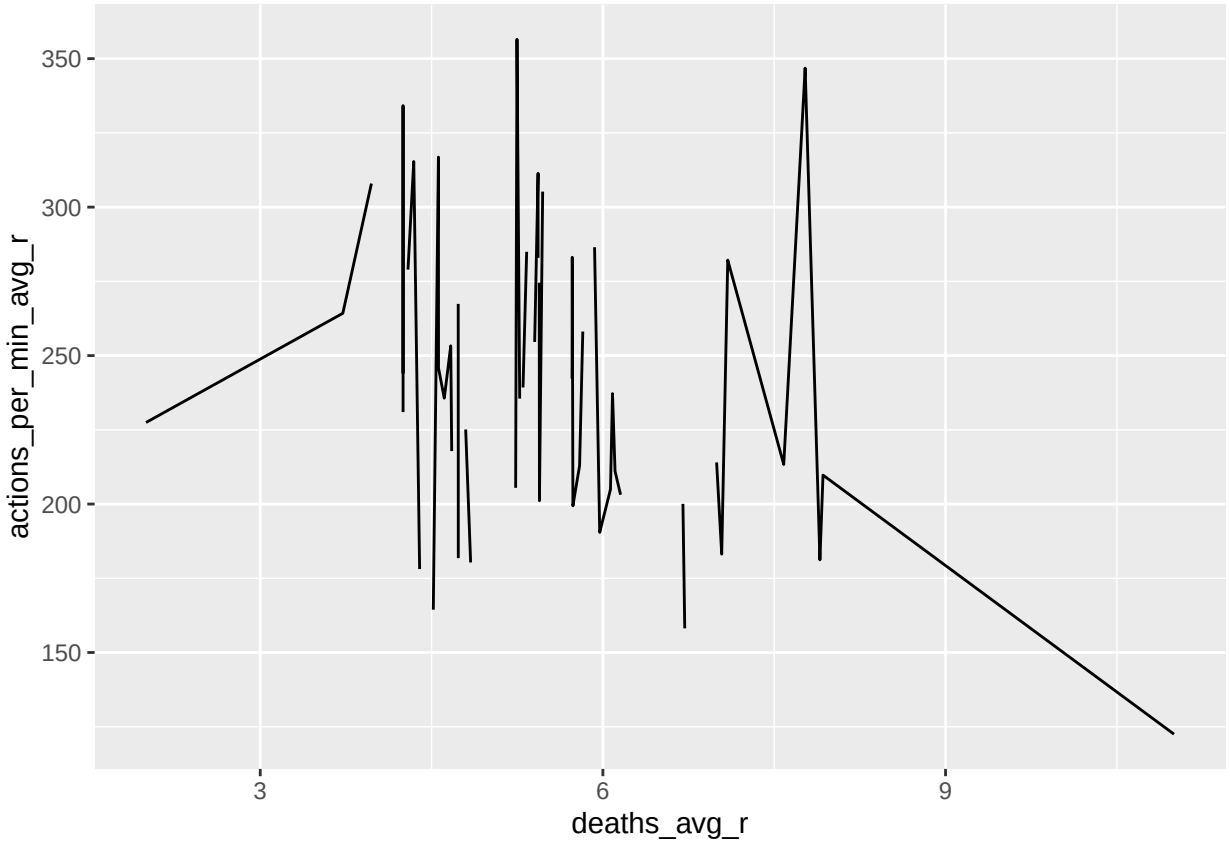

```
ggplot(data, aes(x = courier_kills_avg_r, y = deaths_avg_r, fill = radiant_win)) +
 geom_col(position = "identity")
```

```
## Warning: Removed 40 rows containing missing values (geom_col).
```



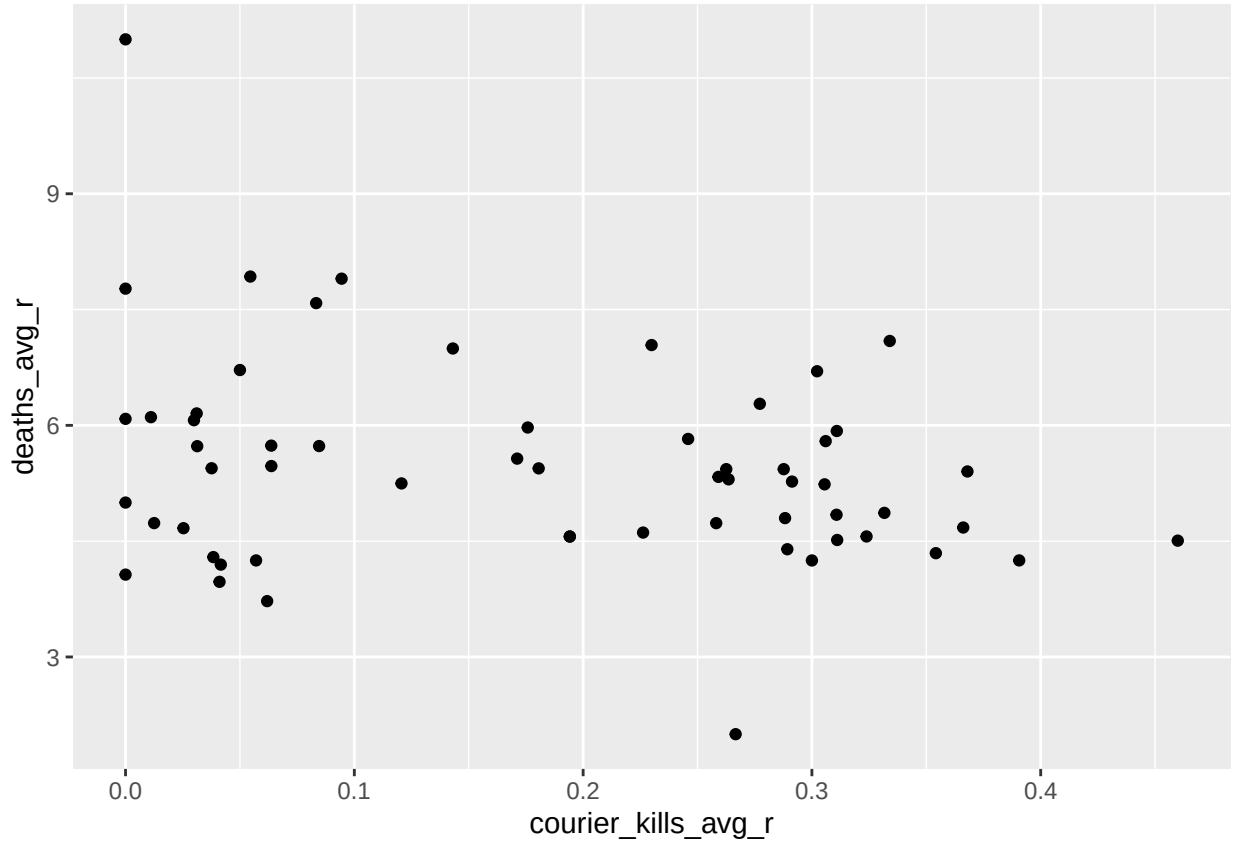

```
ggplot(data,aes(x=deaths_avg_r,y=actions_per_min_avg_r))+geom_line()
```

```
## Warning: Removed 4 row(s) containing missing values (geom_path).
```



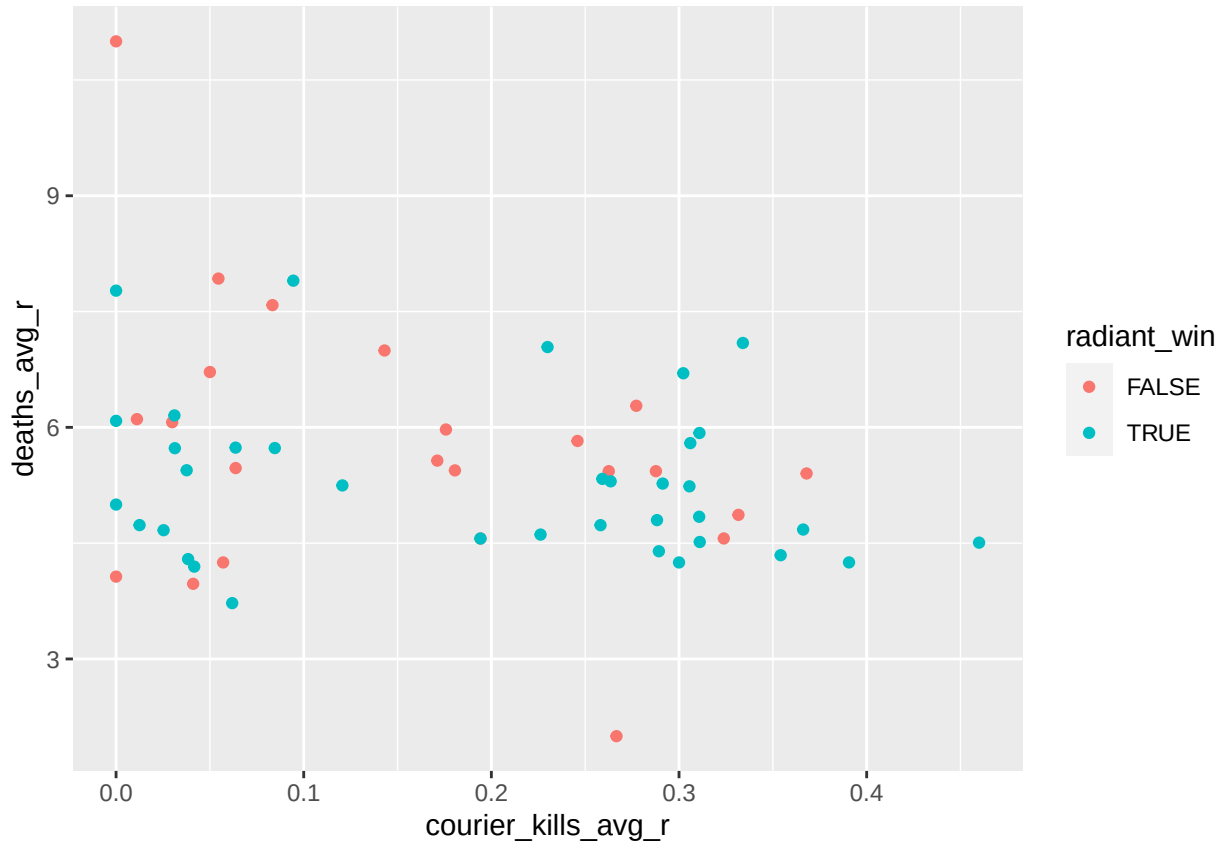

```
ggplot(data,aes(x=courier_kills_avg_r,y=deaths_avg_r))+geom_point()
```

```
## Warning: Removed 40 rows containing missing values (geom_point).
```



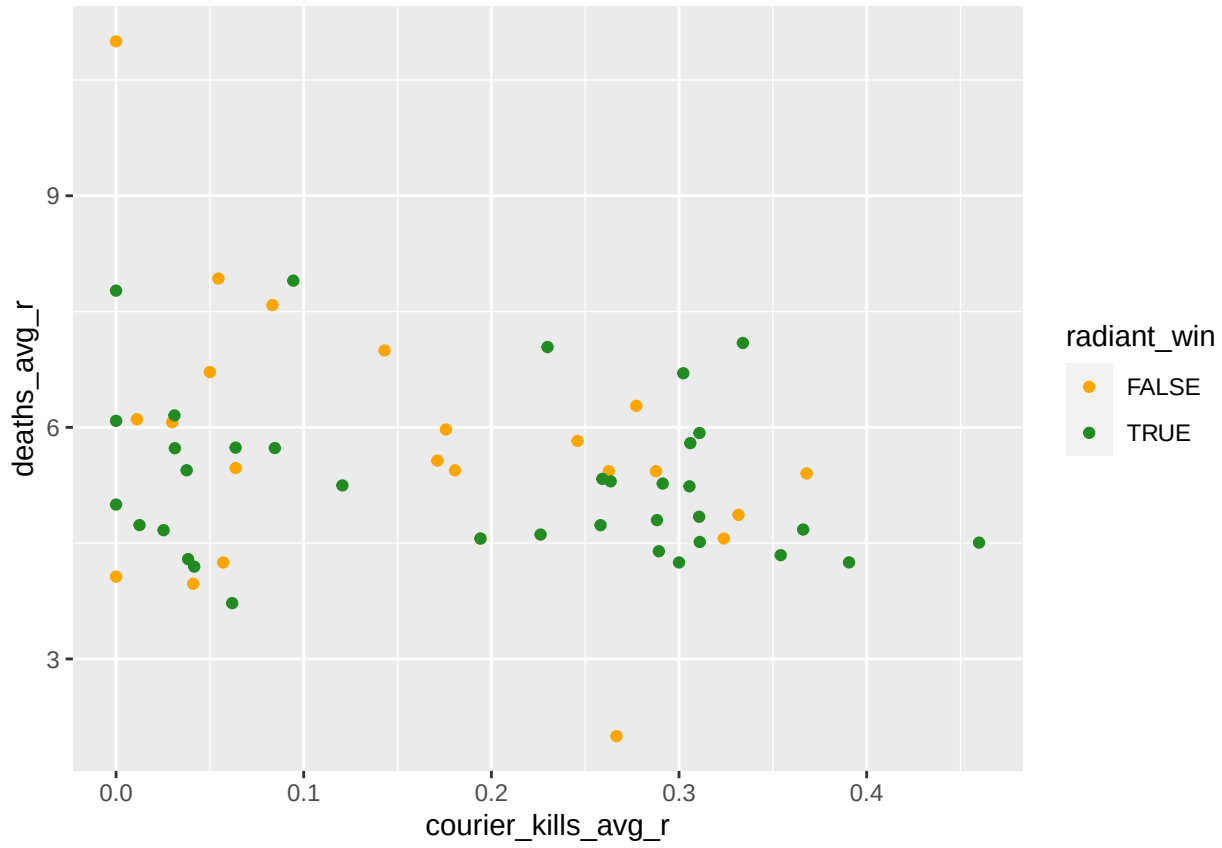

```
ggplot(data,aes(x=courier_kills_avg_r,y=deaths_avg_r))+geom_point(aes(colour=radiant_win))
```

```
## Warning: Removed 40 rows containing missing values (geom_point).
```



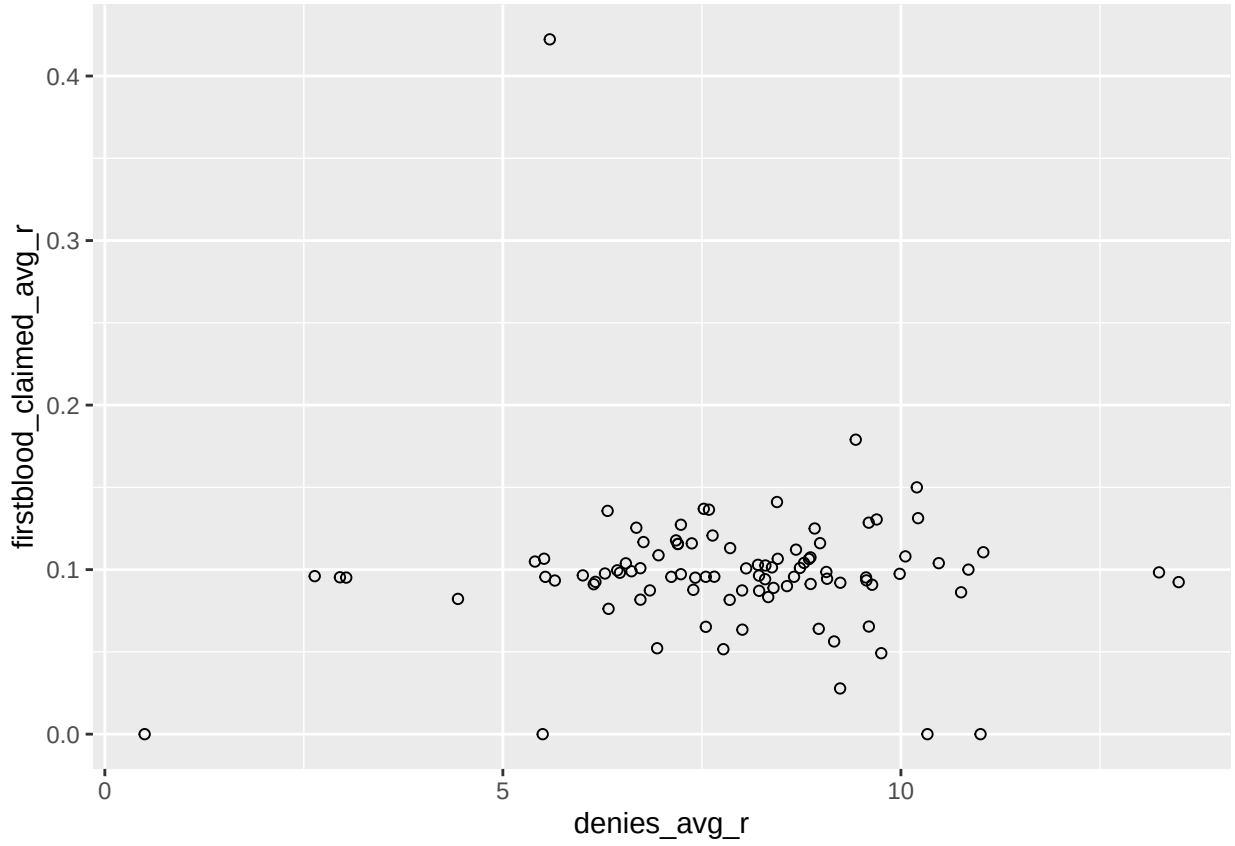

```
ggplot(data,aes(x=courier_kills_avg_r,y=deaths_avg_r))+geom_point(aes(colour=radiant_win))+scale_colou
```

```
## Warning: Removed 40 rows containing missing values (geom_point).
```



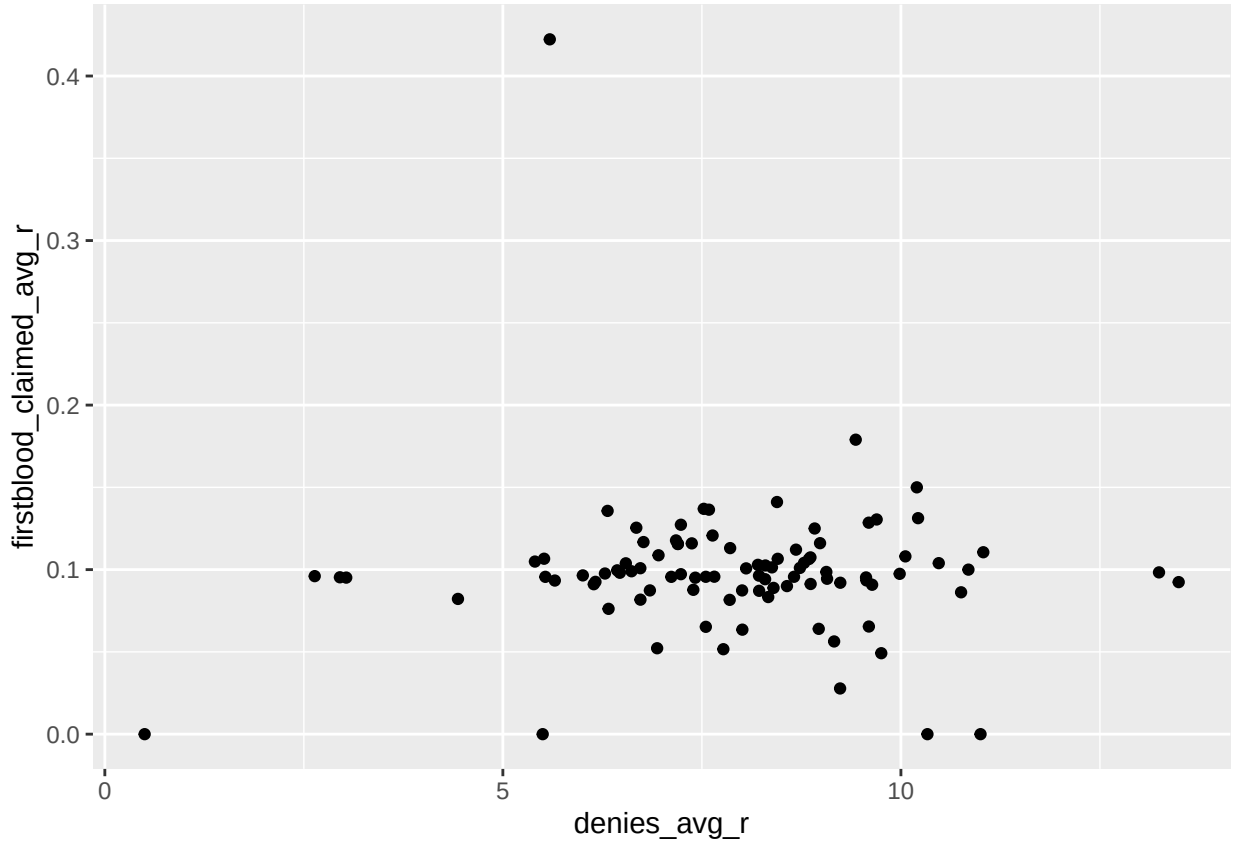

```
ggplot(data,aes(x=denies_avg_r,y=firstblood_claimed_avg_r))+geom_point(shape=21)
```

```
## Warning: Removed 4 rows containing missing values (geom_point).
```



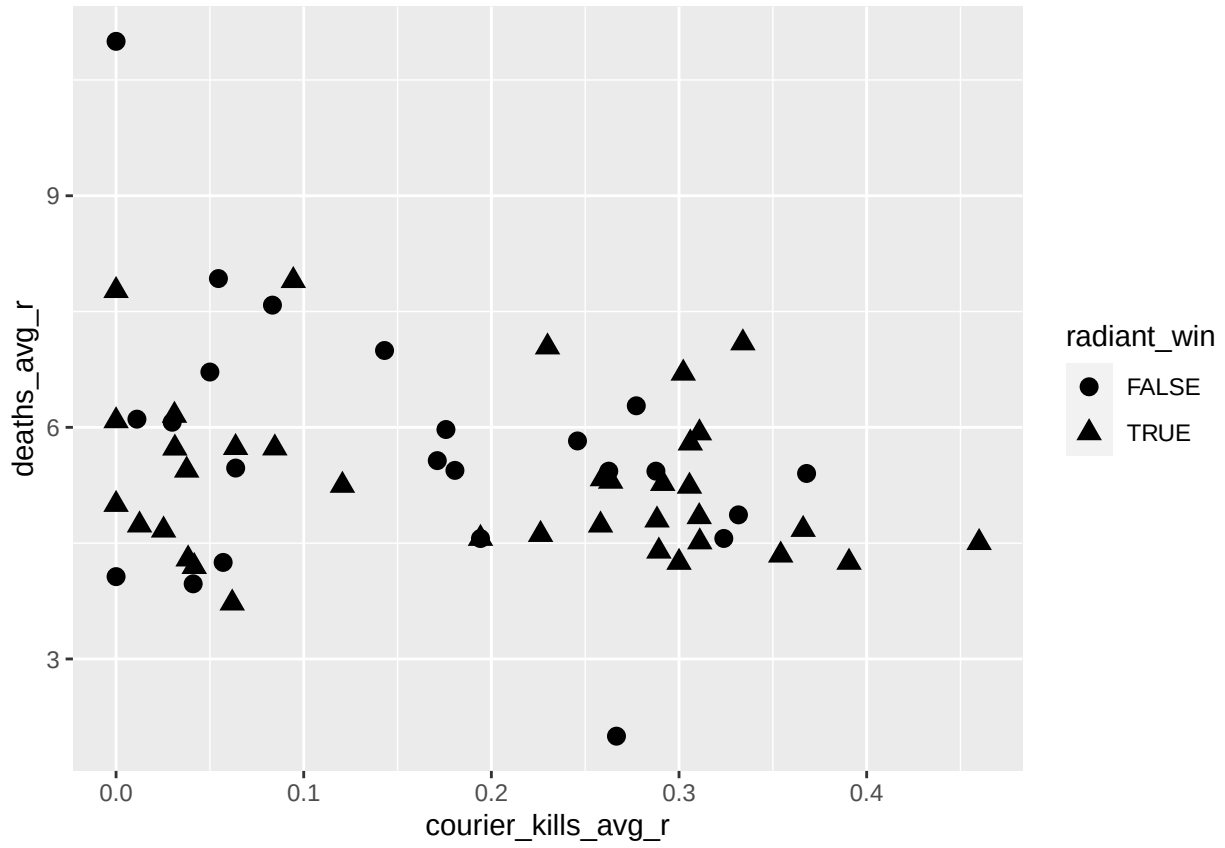

```
ggplot(data,aes(x=denies_avg_r,y=firstblood_claimed_avg_r))+geom_point(size=1.5)
```

```
## Warning: Removed 4 rows containing missing values (geom_point).
```



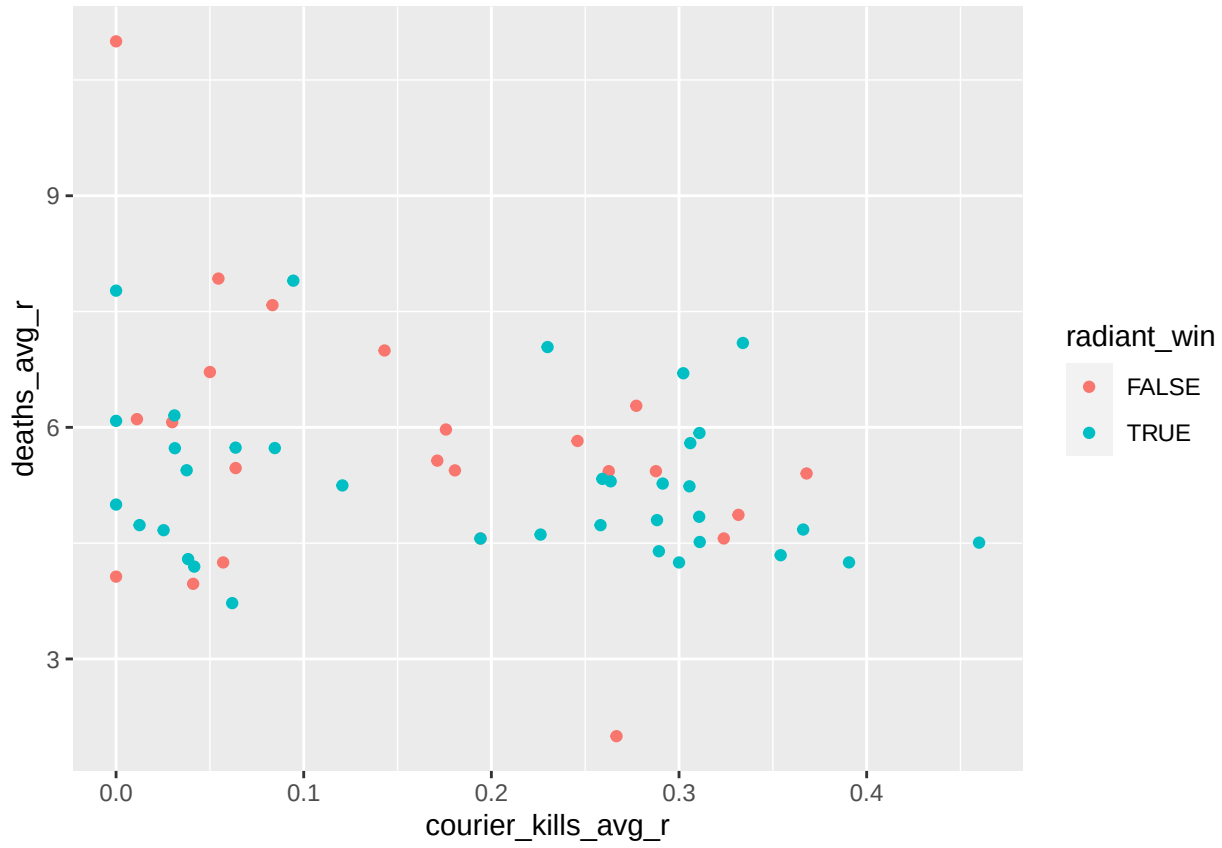

```
ggplot(data,aes(x=courier_kills_avg_r,y=deaths_avg_r,shape=radiant_win))+geom_point(size=3)+scale_col
```

```
## Warning: Removed 40 rows containing missing values (geom_point).
```



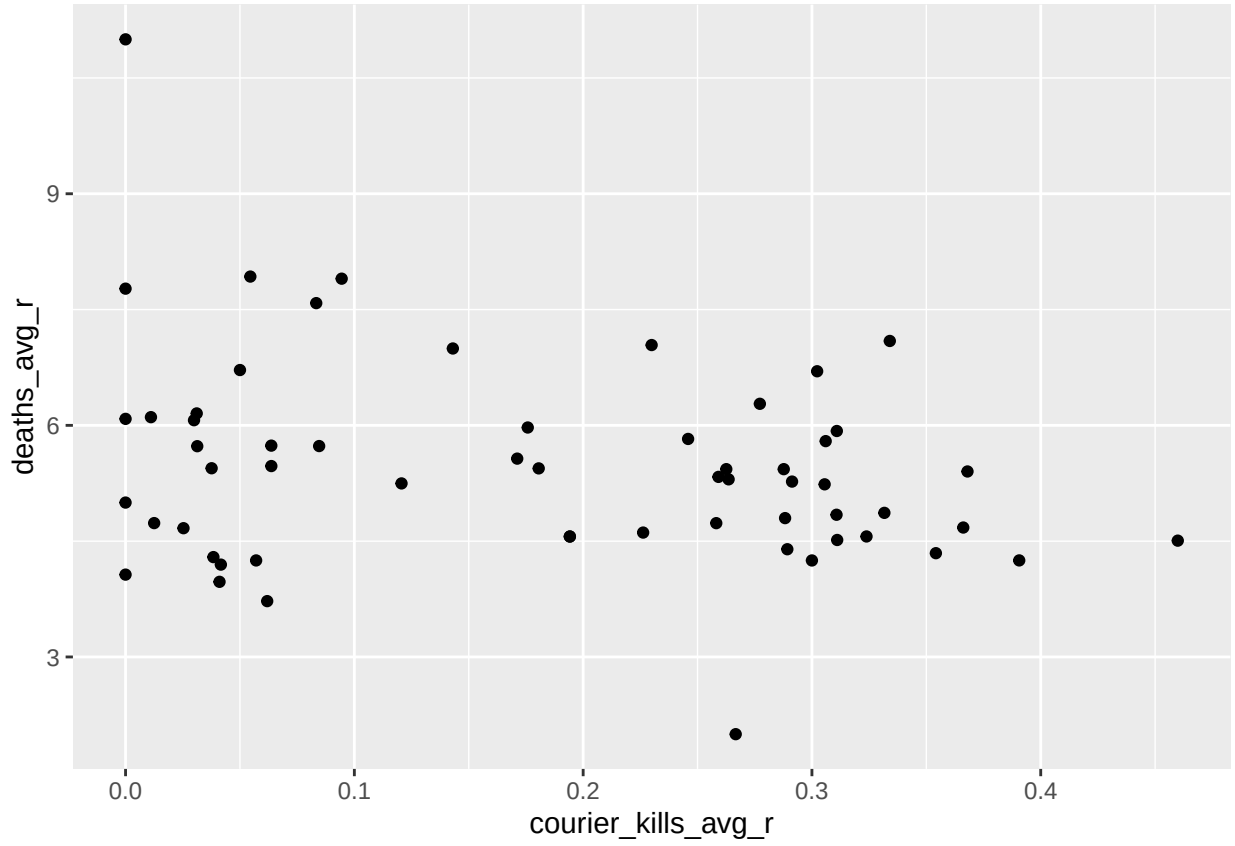

```
    ggplot(data,aes(x=courier_kills_avg_r,y=deaths_avg_r,colour=radiant_win))+geom_point()
```

```
## Warning: Removed 40 rows containing missing values (geom_point).
```



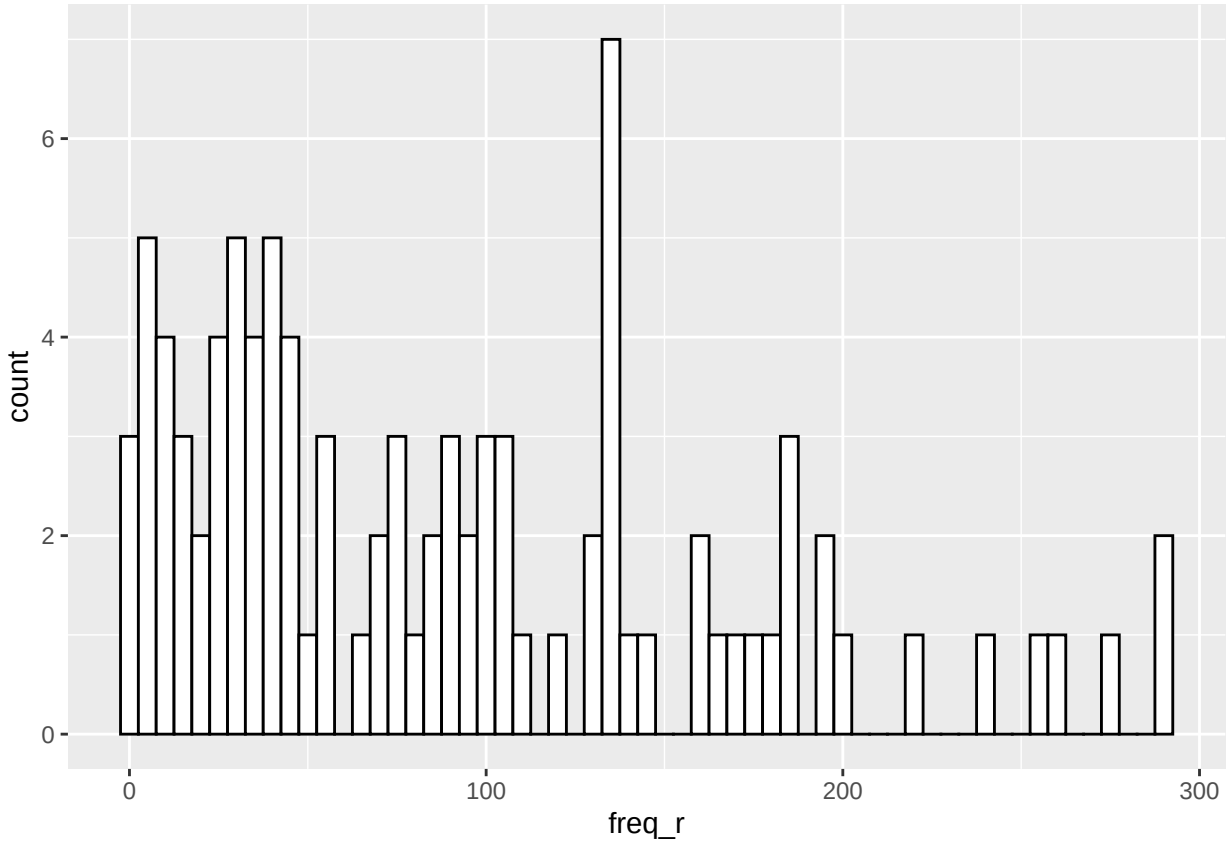

```
ggplot(data,aes(x=courier_kills_avg_r,y=deaths_avg_r))+geom_point(position="jitter")
```

```
## Warning: Removed 40 rows containing missing values (geom_point).
```




```
ggplot(data,aes(x=freq_r))+geom_histogram(binwidth=5,fill="white",colour="black")
```

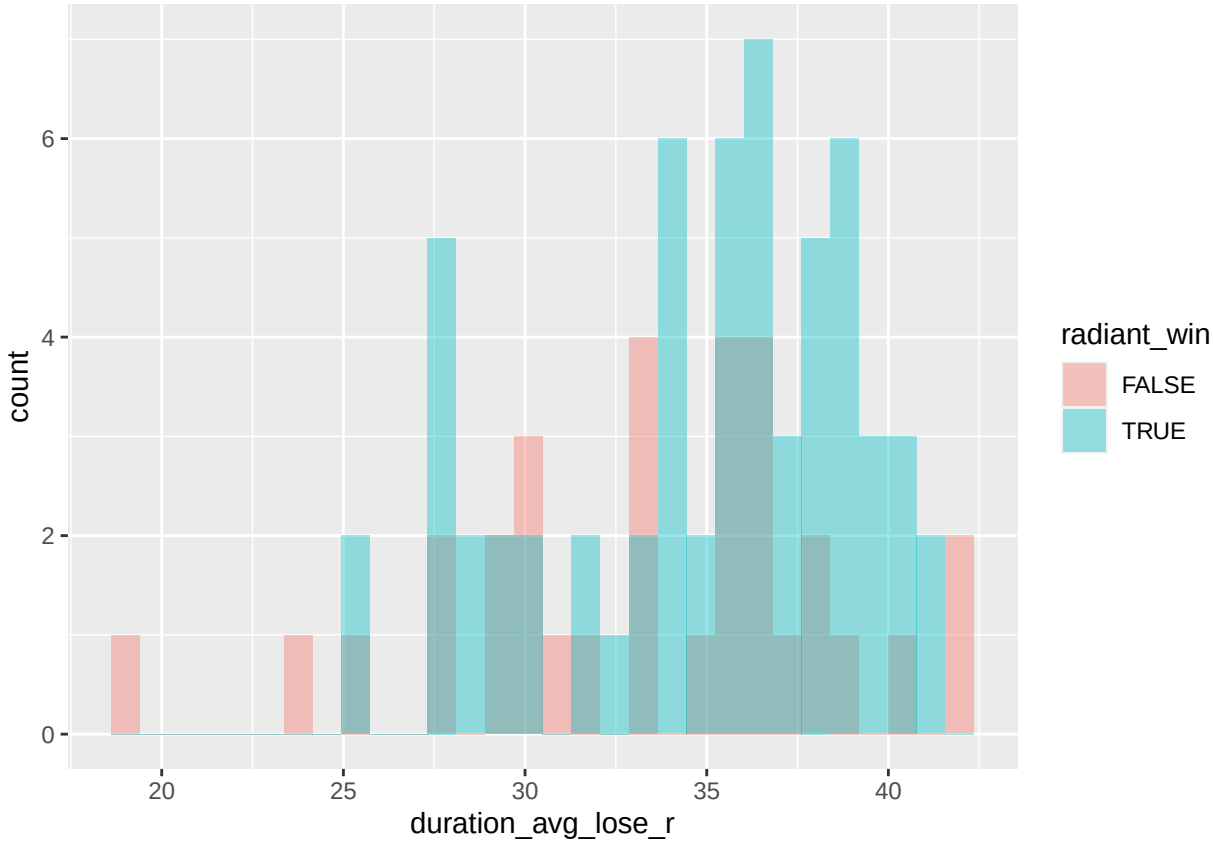
```
## Warning: Removed 4 rows containing non-finite values (stat_bin).
```




```
ggplot(data,aes(x=duration_avg_lose_r,fill=radiant_win))+geom_histogram(position="identity",alpha=0.
```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

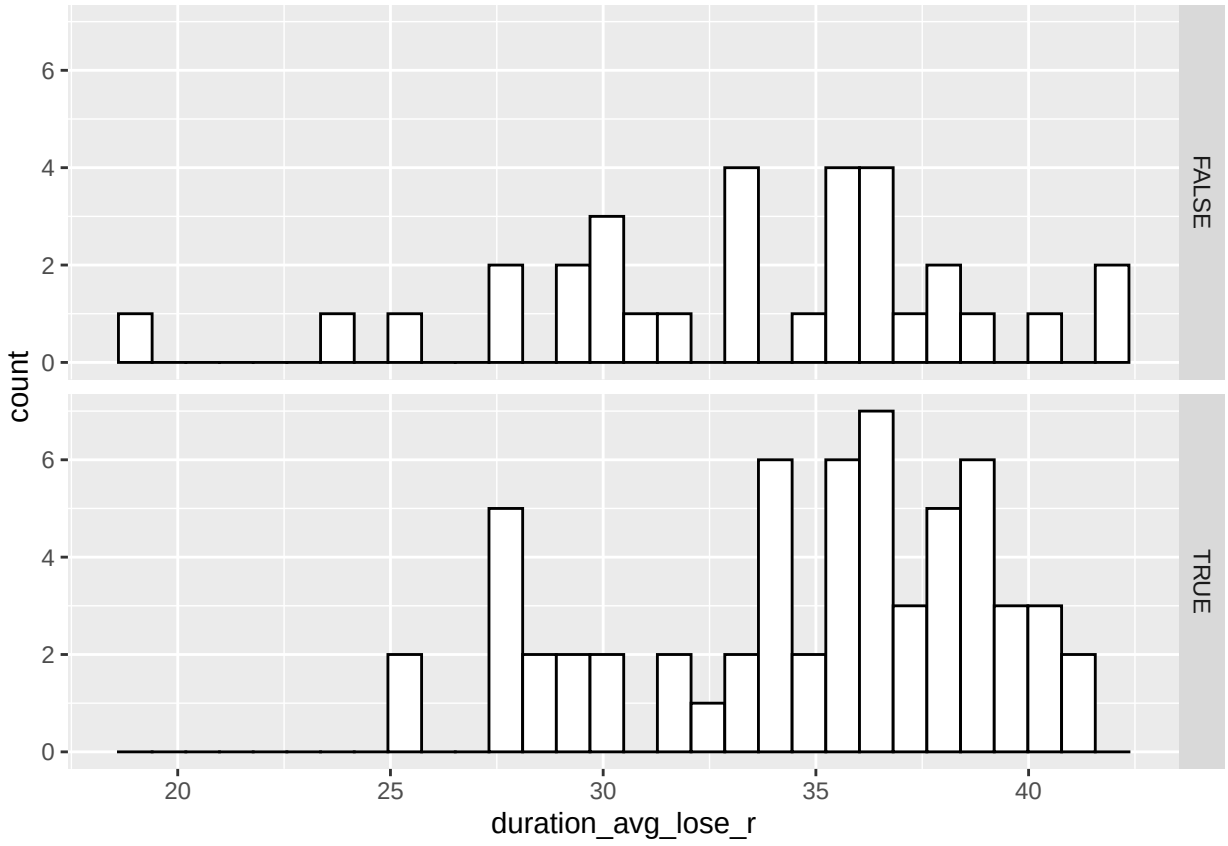
```
## Warning: Removed 6 rows containing non-finite values (stat_bin).
```




```
    ggplot(data,aes(x=duration_avg_lose_r))+geom_histogram(fill="white",colour="black")+facet_grid(radi
```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

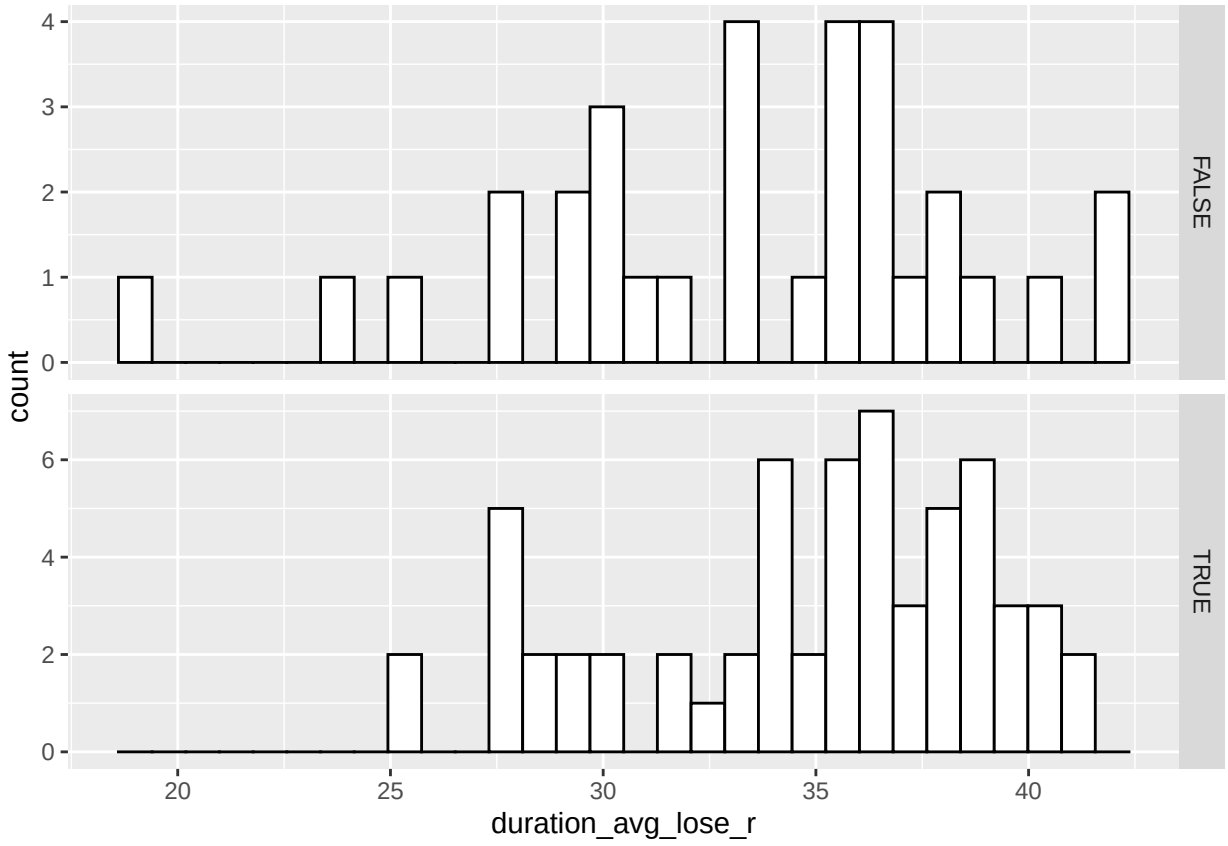
```
## Warning: Removed 6 rows containing non-finite values (stat_bin).
```




```
    ggplot(data,aes(x=duration_avg_lose_r))+geom_histogram(fill="white",colour="black")+facet_grid(radia
```

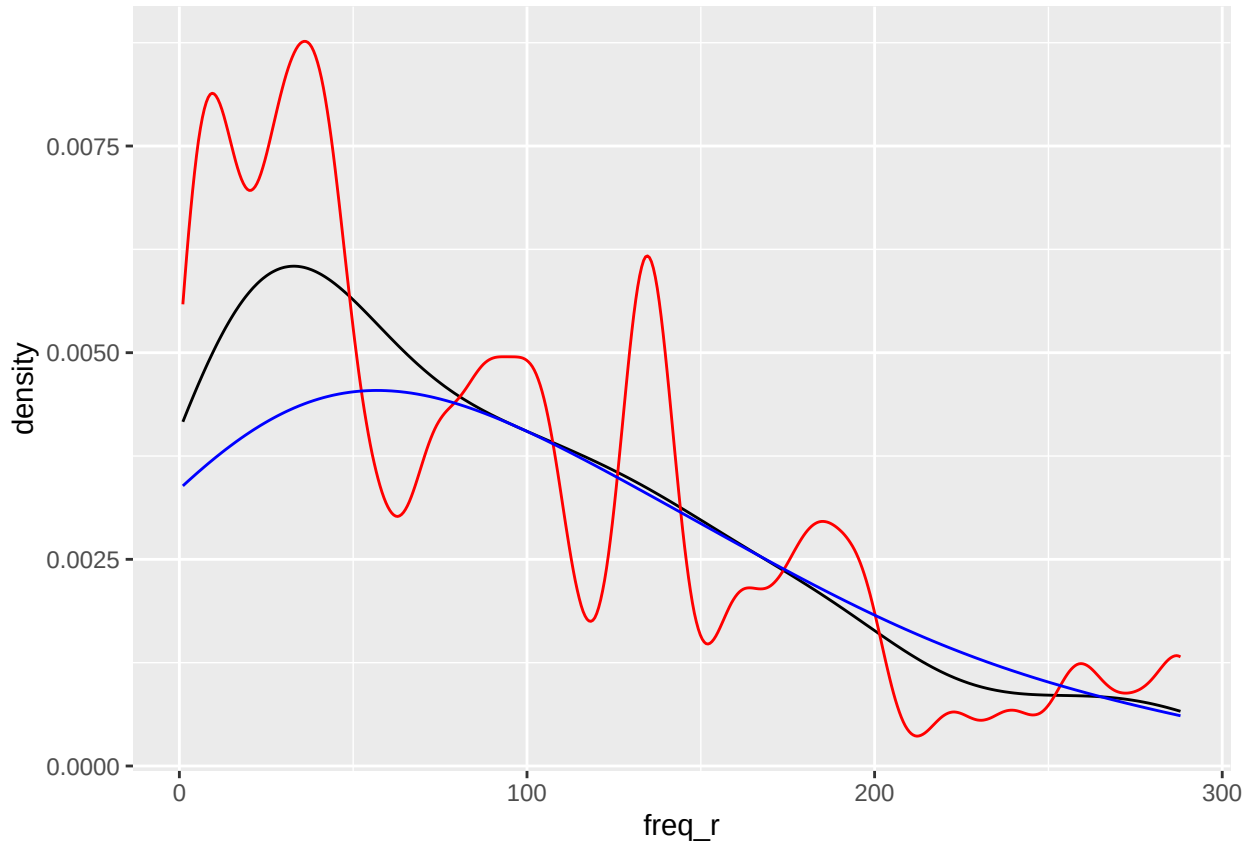
```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

```
## Warning: Removed 6 rows containing non-finite values (stat_bin).
```



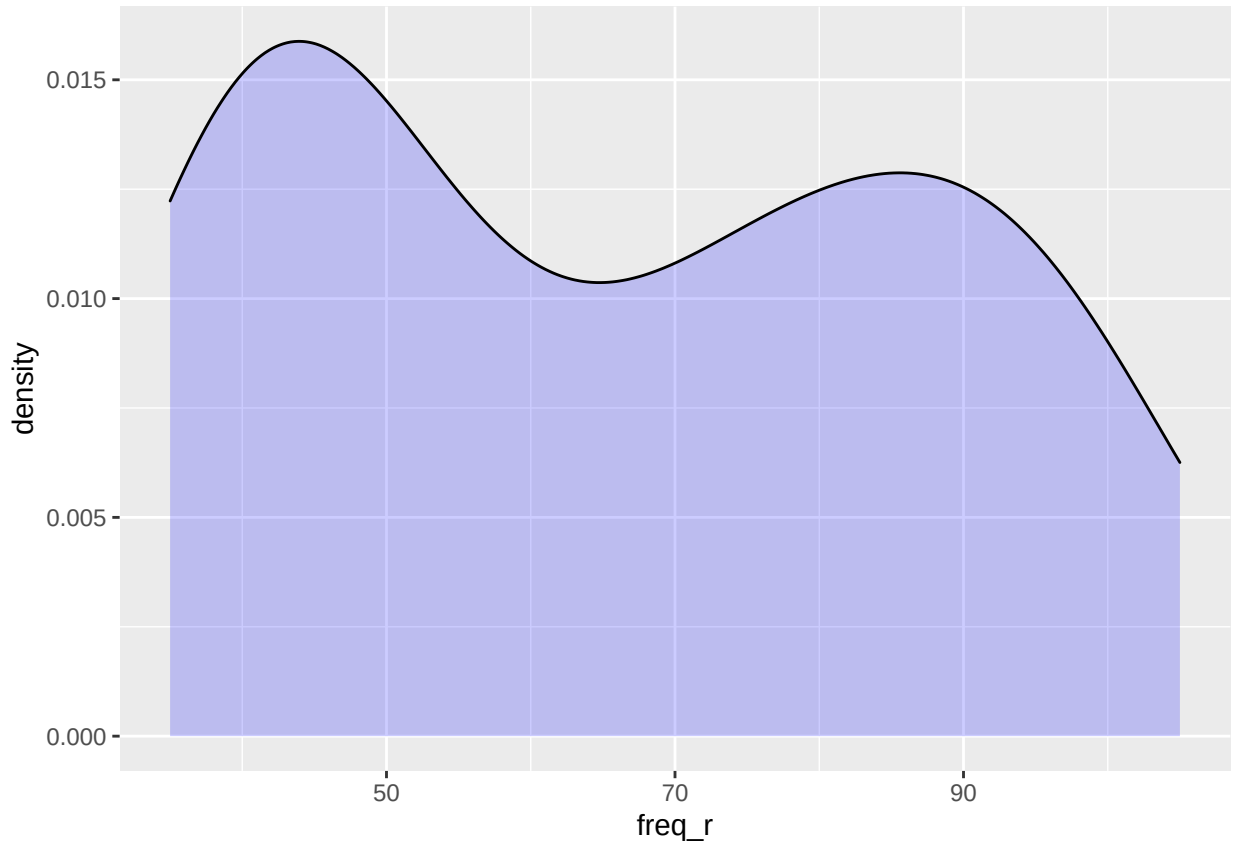

```
  ggplot(data, aes(x = freq_r)) +
geom_line(stat = "density") +
geom_line(stat = "density", adjust = .25, colour = "red") +
geom_line(stat = "density", adjust = 2, colour = "blue")
```

```
## Warning: Removed 4 rows containing non-finite values (stat_density).
## Removed 4 rows containing non-finite values (stat_density).
## Removed 4 rows containing non-finite values (stat_density).
```



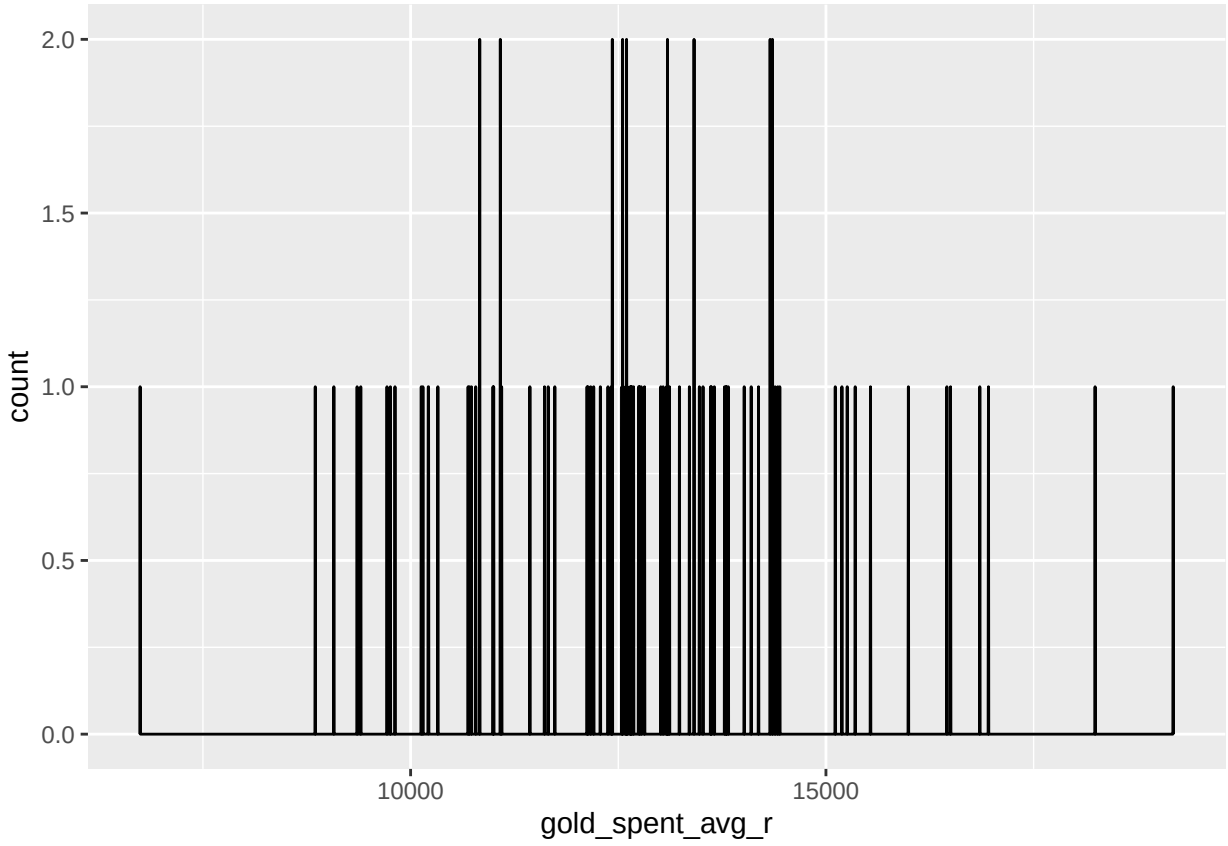

```
   ggplot(data, aes(x = freq_r)) +
geom_density(fill = "blue", alpha = .2) +
xlim(35, 105)
```

```
## Warning: Removed 66 rows containing non-finite values (stat_density).
```



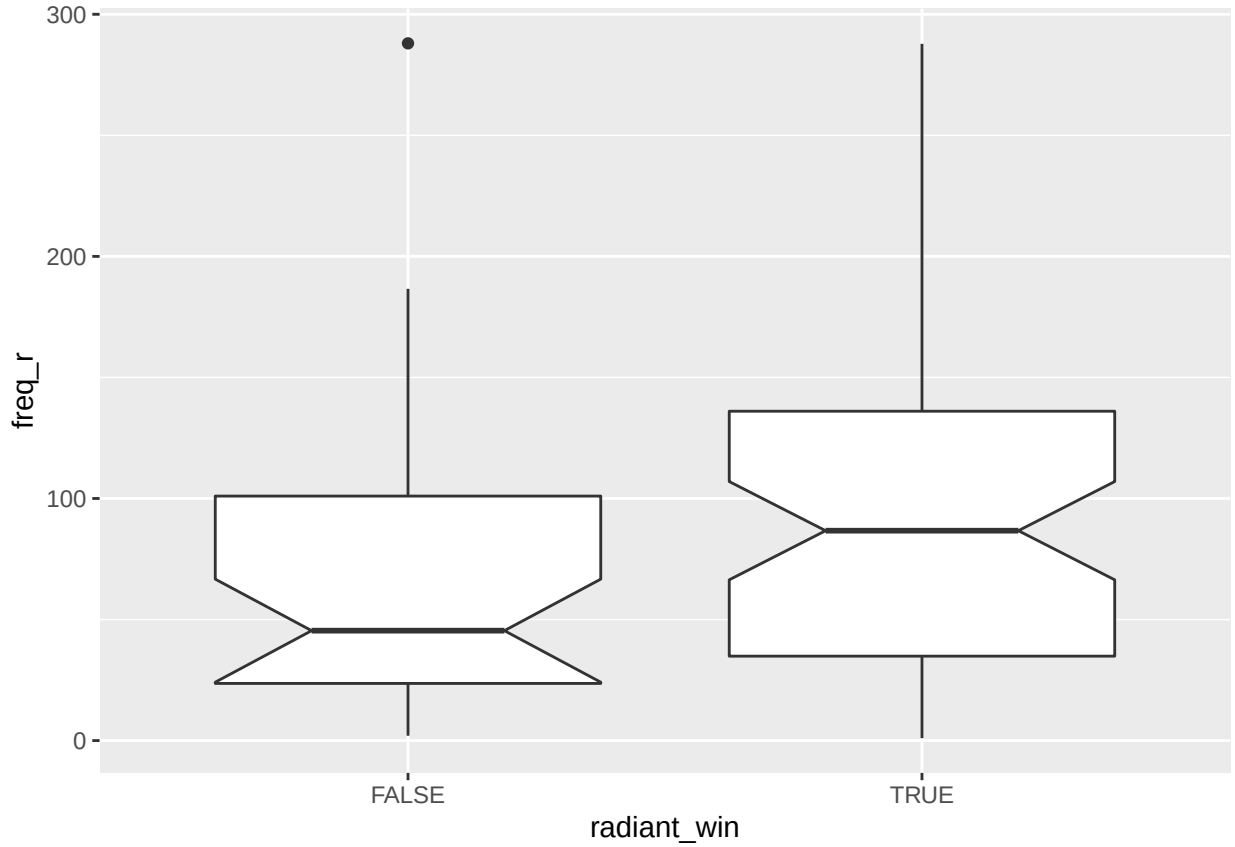

```
 ggplot(data, aes(x = gold_spent_avg_r)) +
geom_freqpoly(binwidth = 4)
```

```
## Warning: Removed 4 rows containing non-finite values (stat_bin).
```




```
   ggplot(data, aes(x = radiant_win, y = freq_r)) +
geom_boxplot(notch = TRUE)
```

```
## Warning: Removed 4 rows containing non-finite values (stat_boxplot).
```

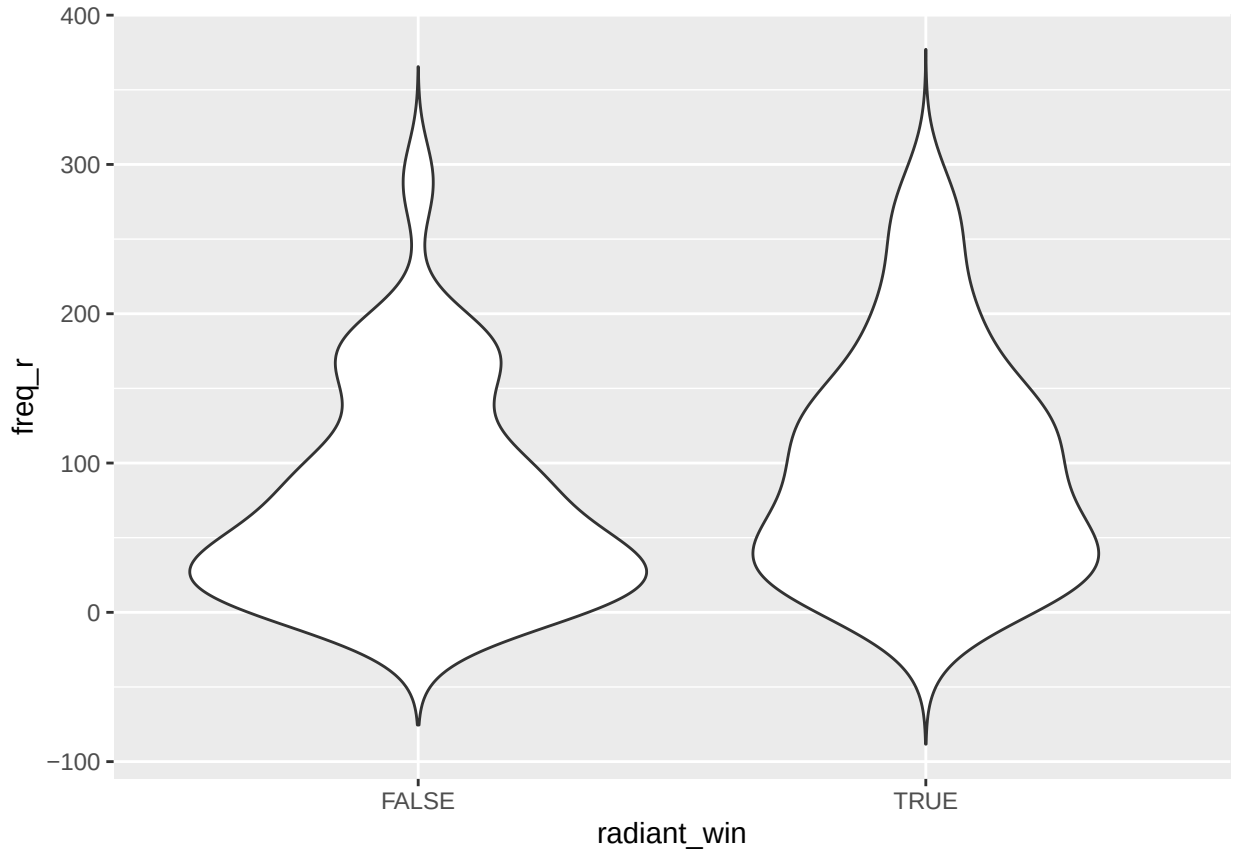



```
  ggplot(data, aes(x = radiant_win, y = freq_r))+geom_violin()
```

```
## Warning: Removed 4 rows containing non-finite values (stat_ydensity).
```

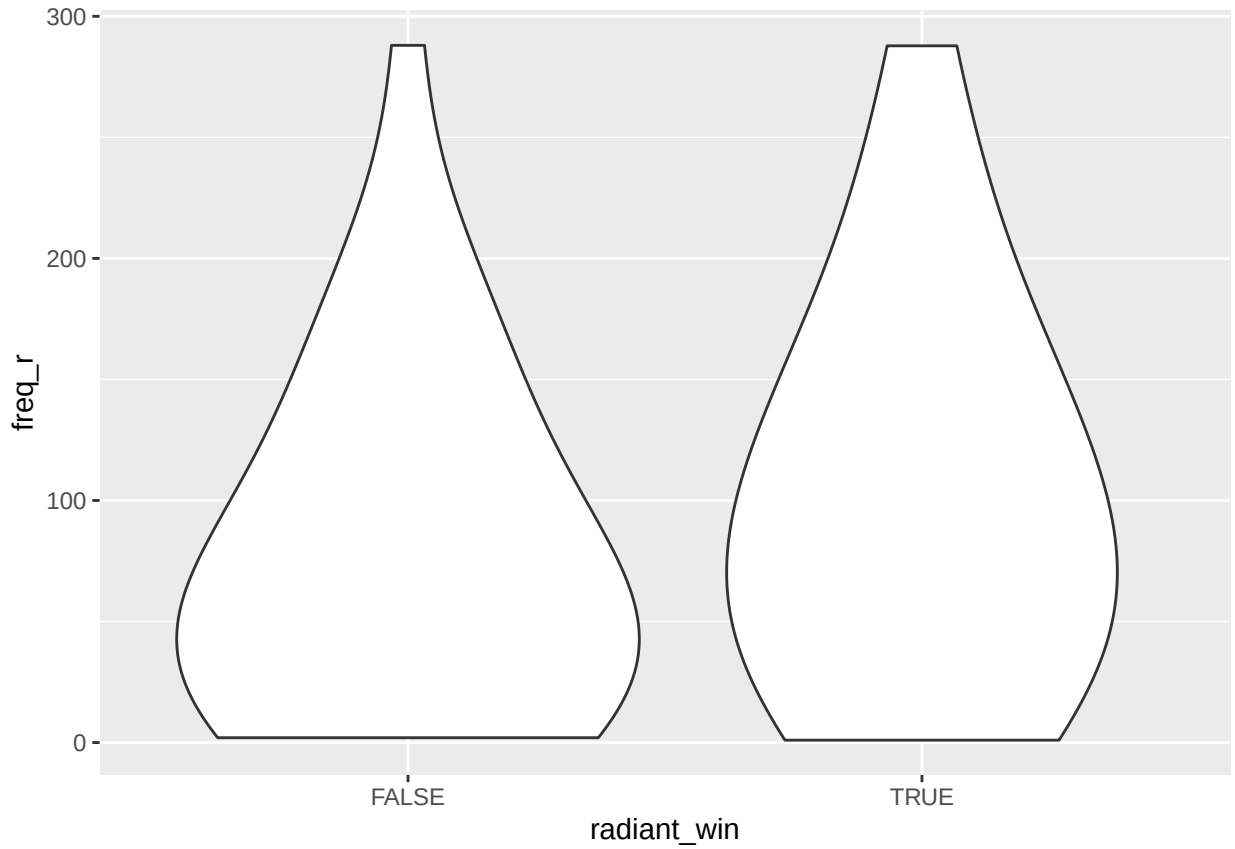

```
ggplot(data, aes(x = radiant_win, y = freq_r))+geom_violin(trim=FALSE)
```

```
## Warning: Removed 4 rows containing non-finite values (stat_ydensity).
```




```
ggplot(data, aes(x = radiant_win, y = freq_r))+geom_violin(adjust=2)
```

```
## Warning: Removed 4 rows containing non-finite values (stat_ydensity).
```



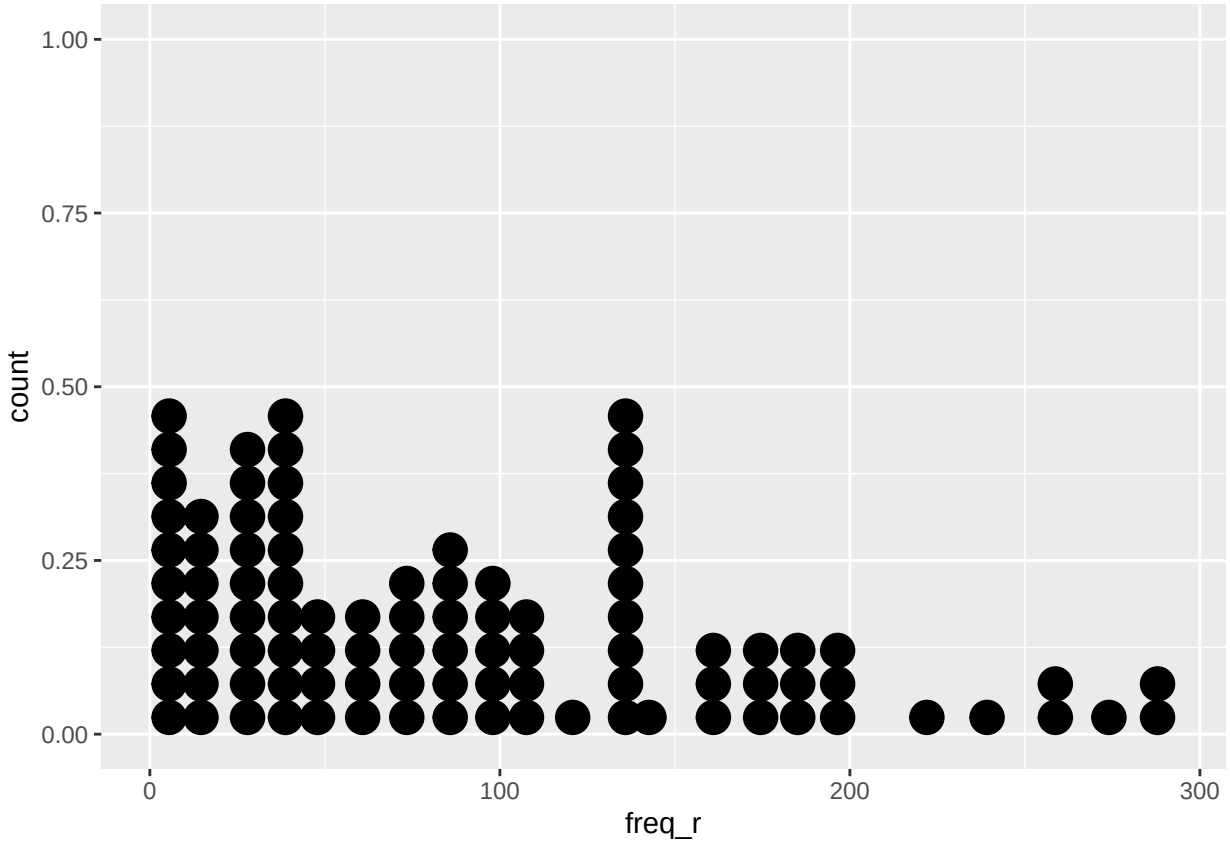

```
ggplot(data, aes(x = radiant_win, y = freq_r))+geom_violin(adjust=.5)
```

```
## Warning: Removed 4 rows containing non-finite values (stat_ydensity).
```


```
ggplot(data, aes(x =  freq_r))+geom_dotplot()
```

```
## Bin width defaults to 1/30 of the range of the data. Pick better value with `binwidth`.
```

```
## Warning: Removed 4 rows containing non-finite values (stat_bindot).
```


1.00
0.75
0.50
0.25
0.00
count
0
100
200
300
freq_r