include.r

denis

2021-07-11

#!/usr/bin/r  
  
if (require("tidyr", quietly = TRUE)) {  
 fruits <- c(  
 type = c("apple", "orange", "apple", "orange", "orange", "orange"),  
 year = c(2010, 2010, 2012, 2010, 2010, 2012),  
 size = c("XS", "S", "M", "S", "S", "M"),  
 weights = rnorm(6)  
 )  
   
 # All possible combinations ---------------------------------------  
 fruits  
}

## type1 type2 type3 type4   
## "apple" "orange" "apple" "orange"   
## type5 type6 year1 year2   
## "orange" "orange" "2010" "2010"   
## year3 year4 year5 year6   
## "2012" "2010" "2010" "2012"   
## size1 size2 size3 size4   
## "XS" "S" "M" "S"   
## size5 size6 weights1 weights2   
## "S" "M" "-1.8890115771311" "0.153582413347238"   
## weights3 weights4 weights5 weights6   
## "-0.29797187153706" "0.192562375258926" "0.336132669281043" "1.4129832873434"

# Note that 'from' and 'to' contain valid but empty intervals.  
  
to <- c(  
 matrix(  
 c(  
 2, 6,  
 2, 8,  
 2, 9,  
 4, 4,  
 6, 8  
 ),  
 ncol = 2, byrow = TRUE  
 ),  
 closed = c( TRUE, FALSE ),  
 type = "Z"  
)  
  
from <- c(  
 matrix(  
 c(  
 2, 8,  
 8, 9,  
 6, 9,  
 11, 12,  
 3, 3  
 ),  
 ncol = 2, byrow = TRUE  
 ),  
 closed = c( TRUE, FALSE ),  
 type = "Z"  
)  
rownames <- letters  
  
rownames

## [1] "a" "b" "c" "d" "e" "f" "g" "h" "i" "j" "k" "l" "m" "n" "o" "p" "q" "r" "s"  
## [20] "t" "u" "v" "w" "x" "y" "z"

to

##   
## "2" "2" "2" "4" "6" "6" "8" "9" "4" "8"   
## closed1 closed2 type   
## "TRUE" "FALSE" "Z"

closed <- TRUE  
to

##   
## "2" "2" "2" "4" "6" "6" "8" "9" "4" "8"   
## closed1 closed2 type   
## "TRUE" "FALSE" "Z"

# Intervals\_full  
  
F <- FALSE  
T <- TRUE  
  
to <- c(  
 rep( c(2,8), c(4,4) ),  
 closed = matrix( c(F,F,T,T,F,T,F,T), ncol = 2 ),  
 type = "R"  
)  
  
type <- "R"  
from <- c( from, "Intervals\_full" )  
  
from

##   
## "2" "8" "6" "11"   
##   
## "3" "8" "9" "9"   
## closed1 closed2   
## "12" "3" "TRUE" "FALSE"   
## type   
## "Z" "Intervals\_full"

to

## closed1 closed2   
## "2" "2" "2" "2" "8" "8" "8" "8" "FALSE" "FALSE"   
## closed3 closed4 closed5 closed6 closed7 closed8 type   
## "TRUE" "TRUE" "FALSE" "TRUE" "FALSE" "TRUE" "R"

c(from, to)

##   
## "2" "8" "6" "11"   
##   
## "3" "8" "9" "9"   
## closed1 closed2   
## "12" "3" "TRUE" "FALSE"   
## type   
## "Z" "Intervals\_full" "2" "2"   
##   
## "2" "2" "8" "8"   
## closed1 closed2   
## "8" "8" "FALSE" "FALSE"   
## closed3 closed4 closed5 closed6   
## "TRUE" "TRUE" "FALSE" "TRUE"   
## closed7 closed8 type   
## "FALSE" "TRUE" "R"

# Testing  
  
B <- 1000  
  
x1 <- rexp( B, 1/1000 )  
s1 <- runif( B, max=5 )  
x2 <- rexp( B, 1/1000 )  
s2 <- runif( B, max=3 )  
  
from <- c( cbind( x1, x1 + s1 ) )  
to <- c( cbind( x2, x2 + s2 ) )  
  
ii <- c( from, to )  
ii\_match <- which( sapply( ii, length ) > 0 )  
  
from

## [1] 109.712783 195.283802 1350.778051 541.957696 2517.611550 392.946871  
## [7] 224.931083 227.307057 3468.772501 982.547546 420.948209 519.716084  
## [13] 1931.708695 692.358545 981.720752 60.012677 95.329677 3335.070021  
## [19] 518.021434 2082.441291 15.257237 2812.162526 261.968265 41.160064  
## [25] 2947.093926 858.429096 615.868244 918.909616 4548.886198 671.146261  
## [31] 154.517299 1221.501589 331.557031 1981.879998 2188.241003 2043.615784  
## [37] 86.854348 1573.187457 7.857806 319.275592 1006.188892 578.948355  
## [43] 387.485095 191.107946 698.211748 284.724056 75.640717 375.698345  
## [49] 594.986868 1730.595374 922.252467 1602.713829 422.710475 1074.361347  
## [55] 90.529360 234.434035 2716.958681 1634.772668 2805.897362 186.804586  
## [61] 115.070539 1182.977489 1633.640987 217.180411 505.738476 1631.124456  
## [67] 2299.751906 364.937842 464.191950 269.233623 512.425705 1330.133839  
## [73] 3239.022165 1759.869838 629.035171 578.006065 768.332472 3346.099302  
## [79] 384.099808 243.249438 2365.264753 1255.875968 2936.227754 1122.933174  
## [85] 600.123931 840.895986 787.188802 749.736174 1274.753614 412.037537  
## [91] 937.992105 443.261853 421.780883 20.265208 965.684216 225.497825  
## [97] 17.785582 1664.295748 1275.024791 1091.639456 1104.603099 34.700302  
## [103] 746.316927 446.184883 1162.064804 764.751881 3521.088140 1069.558217  
## [109] 1477.139708 267.287184 344.864621 1132.406093 7.785093 416.326681  
## [115] 994.661594 120.353031 2619.150931 719.610119 54.328495 659.730700  
## [121] 840.166909 829.176180 1096.562172 581.402949 579.429424 70.819848  
## [127] 1031.575694 701.597257 756.814539 211.143738 1181.268268 883.133333  
## [133] 298.132802 2374.147689 1553.923622 1731.845693 382.799014 6.411064  
## [139] 12.224819 2888.836625 79.495716 204.333671 305.211736 280.529640  
## [145] 127.890429 678.404449 1917.053794 1300.058359 283.538912 975.904706  
## [151] 164.988609 303.322528 616.312341 795.995299 871.630168 67.178219  
## [157] 891.264758 741.126355 250.183231 1734.306570 310.828577 453.782797  
## [163] 1036.868751 2409.275526 379.029531 1200.808606 349.854503 53.048088  
## [169] 497.526062 1967.429241 509.832148 1726.412630 196.404114 99.174195  
## [175] 65.047910 26.777887 738.721630 918.237945 258.302242 858.112183  
## [181] 6926.926119 1790.983289 961.384071 1352.224127 1385.142080 310.660691  
## [187] 2030.724965 755.860044 184.439396 1580.107586 3601.622232 1636.951273  
## [193] 1219.724913 483.731447 908.222658 1012.861642 52.548937 120.133896  
## [199] 1646.371242 469.470708 925.703060 1636.294639 465.260612 811.484010  
## [205] 1065.283878 338.201137 523.328850 4963.384734 2686.997888 885.425425  
## [211] 105.996150 520.800381 167.886796 285.098777 458.292087 1088.725734  
## [217] 505.956192 219.578440 241.502838 1631.795915 116.999785 639.560578  
## [223] 245.351719 1084.094411 269.752440 208.887600 164.970367 194.319417  
## [229] 1259.779746 932.727763 50.635229 6340.307457 764.883878 178.347061  
## [235] 42.071660 9.665717 556.097852 481.256378 197.258283 727.532032  
## [241] 1044.940202 435.793614 1189.238302 46.120859 229.477563 417.355689  
## [247] 2452.146103 1018.839290 2631.934659 34.779541 476.189681 603.450711  
## [253] 874.023433 1217.249853 708.543342 523.319370 339.180660 931.622522  
## [259] 976.307009 117.988272 256.714111 1462.016975 197.676950 458.032746  
## [265] 4210.399229 2133.863845 39.751680 1735.777365 52.465594 222.990044  
## [271] 280.836282 153.792247 709.899956 1407.285891 1220.855684 681.585536  
## [277] 3986.415108 604.014218 57.399157 633.304974 2043.197779 88.267229  
## [283] 525.529566 463.374546 524.079558 374.982934 802.263501 137.492123  
## [289] 1082.369512 19.479154 1150.384963 116.386940 531.290564 814.426663  
## [295] 36.099992 170.855977 650.152686 371.580196 206.625267 886.289929  
## [301] 995.658774 134.663470 232.725726 1226.469647 478.082547 27.556576  
## [307] 23.109487 779.425485 1498.272071 4507.925112 1679.435715 484.829145  
## [313] 272.730030 1049.385092 521.820411 43.289113 122.086524 2342.450129  
## [319] 828.356276 1215.799320 1439.541297 912.165445 521.156472 1047.483883  
## [325] 375.020993 1826.241378 6001.825671 19.089318 1136.380885 1117.868490  
## [331] 459.592129 600.030793 254.915740 998.401260 2502.888402 305.121561  
## [337] 168.883789 844.110979 314.352419 97.836763 247.461406 29.278061  
## [343] 894.809186 1717.226362 3518.661333 732.327361 517.866880 877.126628  
## [349] 616.158043 242.850563 430.027632 903.916021 872.577855 143.003205  
## [355] 1034.706036 5018.732209 114.272709 527.874134 3082.382239 240.829127  
## [361] 3177.429110 2116.106255 1707.673909 1770.873542 99.981524 823.193942  
## [367] 287.520710 573.380972 2154.288409 91.032009 791.197798 46.830160  
## [373] 818.958994 787.886014 2769.308390 1822.210686 620.159805 970.029682  
## [379] 409.201614 371.244886 312.388217 102.182031 1493.444994 2469.206298  
## [385] 813.961174 194.884871 1156.311823 174.704930 957.790448 667.604064  
## [391] 97.975918 1481.755396 235.296946 604.032627 1200.657542 124.613694  
## [397] 1389.386131 543.976090 305.897797 2986.330464 1442.244270 981.008391  
## [403] 986.287907 471.453968 2422.442274 3238.074607 109.774820 172.314727  
## [409] 1138.417005 64.957721 1177.295722 419.799371 250.004527 720.490169  
## [415] 1726.348264 625.070219 2090.103375 283.940464 1086.356081 214.231425  
## [421] 368.748123 235.041968 1406.505954 3596.696997 1901.466414 879.993658  
## [427] 80.927459 254.993039 963.175470 759.669321 3738.684794 863.512115  
## [433] 2265.683452 2519.013075 37.217322 1985.487947 2241.837202 231.158384  
## [439] 404.719777 618.564331 106.323258 325.672180 1184.534123 1123.767088  
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## [457] 2025.720168 214.153778 5803.859471 832.740138 494.308985 1471.304988  
## [463] 244.758036 260.351177 887.834920 669.739659 460.421289 9.851598  
## [469] 429.305951 1842.065491 439.770092 542.827596 1983.148057 540.217281  
## [475] 103.961884 961.330012 46.453330 1712.429478 208.207440 1088.074699  
## [481] 83.339562 287.950588 70.289585 82.909922 524.943406 2144.395998  
## [487] 1622.223651 778.877228 566.106037 2986.194849 1937.952224 1311.898332  
## [493] 586.425346 965.687243 2116.945386 956.972476 131.740902 1013.393163  
## [499] 1166.839793 3056.721745 1970.352525 514.834133 590.489318 693.821917  
## [505] 140.414112 321.642582 10.731317 376.286301 1208.844281 2412.499571  
## [511] 330.388439 928.270227 579.639570 584.070098 709.451838 713.730321  
## [517] 326.598920 21.510860 678.370961 5.128841 1075.579541 2288.146673  
## [523] 808.245766 24.147833 507.337951 2021.354698 1933.086246 3267.133243  
## [529] 1161.376780 175.450285 660.296435 760.220507 1242.086983 58.348673  
## [535] 174.380574 211.326297 60.345175 62.504757 804.436631 1842.000414  
## [541] 27.942874 666.090622 105.529608 497.013042 5.362474 659.604402  
## [547] 637.042550 819.988203 1451.395385 666.365663 2031.080287 316.704281  
## [553] 243.326019 668.696919 716.476988 646.609588 585.655183 1806.766413  
## [559] 266.390238 315.087418 1185.145826 1350.657510 381.699543 397.950371  
## [565] 360.409819 114.723363 193.926706 333.818848 471.184196 1083.989552  
## [571] 133.458332 470.413887 574.334448 947.217724 339.453697 728.446244  
## [577] 2.538620 201.416882 851.196440 293.889028 1175.318531 207.632461  
## [583] 96.577543 46.055104 110.450285 452.468168 492.874823 592.201116  
## [589] 1729.862308 445.477389 533.254274 2956.865430 280.606984 539.940268  
## [595] 184.564530 2048.944579 3159.853898 2021.419918 759.236922 1253.756032  
## [601] 2189.737430 144.391528 185.540291 722.359742 64.980728 1428.785598  
## [607] 264.280738 1708.601704 248.876530 1101.179979 1423.952605 2481.852436  
## [613] 1076.243873 1214.805430 996.234373 570.829707 872.176053 1670.911850  
## [619] 2512.967894 853.141481 1197.697636 33.000155 1243.700975 579.884826  
## [625] 452.043302 55.383097 983.818898 1129.660429 823.541804 1340.573444  
## [631] 41.079134 817.666773 1907.155123 5.982055 404.837627 3373.715540  
## [637] 34.437150 1109.574067 2370.911559 386.631938 620.328000 1520.057226  
## [643] 1054.201002 787.628977 2347.756604 77.229594 2.367462 2420.841213  
## [649] 304.862650 718.819497 1164.714354 279.436509 362.490909 1427.483423  
## [655] 539.344393 2182.974392 1192.405659 232.594038 1436.395392 223.670136  
## [661] 558.736773 32.436888 160.056117 944.802859 1197.238173 800.134261  
## [667] 1172.297879 11.869152 104.231163 392.739367 197.000149 1432.944052  
## [673] 7.912953 53.159870 1024.495088 74.436256 60.412863 814.962867  
## [679] 2992.758699 3892.909324 2268.957196 481.934008 2.384604 2187.349187  
## [685] 1577.805264 211.783467 848.028067 1171.309628 905.876749 1548.024584  
## [691] 722.443782 2456.002047 1223.739261 69.543911 1126.888079 321.701324  
## [697] 1361.839062 585.585073 205.514783 1405.536881 1814.815449 1236.639945  
## [703] 59.244592 23.080060 413.263627 1674.220757 1804.444276 458.037229  
## [709] 282.078646 2927.774684 432.728483 876.866415 406.179763 380.759585  
## [715] 577.017249 591.721883 691.287065 1861.212268 4011.511734 285.581165  
## [721] 145.637166 2258.984616 123.027020 2316.761503 2369.655290 119.553386  
## [727] 1897.496292 121.610730 354.736251 699.638345 1059.734893 219.531899  
## [733] 191.148398 1536.785468 632.719227 891.435203 661.558353 3718.496492  
## [739] 1105.125792 415.883347 422.961981 1775.706349 251.284414 276.417956  
## [745] 403.168234 2144.295273 1946.598664 1374.262554 60.561520 3399.842039  
## [751] 1853.306431 234.785198 53.618340 1098.920294 2969.442631 1559.765341  
## [757] 420.086737 4.083442 1266.268577 1191.383437 798.833350 65.299966  
## [763] 761.758295 1347.918869 131.958499 220.093090 3195.929847 169.918991  
## [769] 583.405170 956.811331 357.308393 1413.621597 144.230599 350.052443  
## [775] 262.170367 1952.388853 20.201747 1329.786525 547.143499 1702.948836  
## [781] 618.138661 251.664501 561.288125 4145.455604 558.087088 400.657746  
## [787] 296.146809 2200.847274 1398.130558 1007.289144 2618.103733 1237.854011  
## [793] 79.841123 526.759767 724.898326 2063.305270 306.088755 634.633882  
## [799] 2.513414 33.013545 2481.125824 260.730167 1015.426635 1182.166841  
## [805] 1352.420784 287.593839 452.146101 16.912610 1682.670617 744.944469  
## [811] 5.965611 710.600383 1445.308473 32.216719 284.282111 1247.736293  
## [817] 471.234654 1012.046878 1184.007662 1202.806859 3376.997068 368.225718  
## [823] 211.063210 780.628003 991.704021 89.656326 3255.137898 85.600783  
## [829] 1519.110541 1638.875121 862.498892 556.187421 344.663093 52.785405  
## [835] 39.207813 385.511755 2109.759075 926.690283 688.072912 968.349547  
## [841] 1081.257683 1297.610136 228.538255 625.875057 962.995795 299.813260  
## [847] 3039.438683 47.485132 1831.976625 471.817543 1746.818190 65.210907  
## [853] 2083.424965 1293.687394 1217.612925 609.880116 447.322136 331.143046  
## [859] 354.595431 3757.679304 2159.285298 1751.231428 2669.247364 2560.292339  
## [865] 840.922961 648.207963 157.939920 445.326061 74.021963 1211.906045  
## [871] 891.299808 2299.941869 230.183422 476.986626 387.551449 143.569272  
## [877] 486.940954 262.103603 2312.688228 171.984583 637.153391 876.226286  
## [883] 74.615876 90.837602 100.623815 369.495137 409.937228 599.085616  
## [889] 2452.953998 2492.837946 935.472819 1352.171864 2222.692432 507.620072  
## [895] 1743.033662 389.513811 667.421770 1815.752750 10.465343 1588.767124  
## [901] 2337.696878 4267.715708 669.604137 22.645921 1355.350024 1306.161663  
## [907] 921.937638 273.675852 378.406817 1295.423404 2236.336353 1796.788533  
## [913] 808.633025 47.071664 49.660938 2694.100702 502.322990 216.598770  
## [919] 1142.604456 40.818640 781.068562 1475.128725 237.999019 119.564106  
## [925] 1746.502995 2923.011981 1215.424243 187.359058 188.381888 309.917354  
## [931] 955.119549 324.450957 1492.789058 1617.701823 1464.912844 1549.118729  
## [937] 1637.542915 709.949081 2.906984 1945.033159 314.876279 336.556972  
## [943] 4119.954383 1044.236693 54.210577 504.321342 340.679935 1966.813665  
## [949] 1222.859490 858.923632 1913.110975 141.038330 296.731070 153.449681  
## [955] 624.361632 1276.022594 1196.882879 102.893409 367.893848 80.884409  
## [961] 2404.147418 1308.752888 442.481958 731.140101 116.099933 860.744585  
## [967] 216.828136 225.165854 659.543911 554.009021 51.344741 115.951008  
## [973] 686.071271 1587.227877 1539.811366 5340.666042 602.389144 44.150834  
## [979] 2533.696795 569.501172 1176.017926 1287.344595 63.546843 163.239894  
## [985] 882.214401 88.991051 86.020038 564.095574 1739.925766 885.294227  
## [991] 128.161513 165.760336 1042.013931 741.738656 321.016656 1465.868683  
## [997] 2292.444462 1766.720803 683.033502 588.319256 114.212602 198.319891  
## [1003] 1351.399746 545.987332 2518.360139 394.686703 224.986798 227.448307  
## [1009] 3473.003232 983.566777 422.958523 524.479565 1935.031203 695.778395  
## [1015] 986.513220 63.796382 95.478073 3339.577249 522.724344 2083.054083  
## [1021] 16.353335 2815.152685 264.270634 45.272382 2950.482515 862.098023  
## [1027] 617.750886 922.379391 4551.767496 674.929329 158.996243 1225.498440  
## [1033] 332.109270 1984.389012 2188.777834 2047.896175 87.418479 1574.317658  
## [1039] 11.458831 324.271276 1009.619441 580.728793 387.538093 195.980300  
## [1045] 702.371753 288.527014 79.655559 375.904188 595.839956 1732.665082  
## [1051] 925.161034 1604.064394 423.541865 1076.193872 90.623830 236.951679  
## [1057] 2719.617259 1639.239806 2810.721825 187.645748 116.073575 1183.512642  
## [1063] 1636.598339 221.870997 508.817885 1632.878678 2304.454086 367.239252  
## [1069] 468.700782 270.980204 515.488001 1330.667517 3241.976070 1760.367489  
## [1075] 632.034439 580.283941 771.995668 3347.744225 388.916058 243.966951  
## [1081] 2369.590451 1258.103628 2936.404520 1126.426009 602.860758 842.887039  
## [1087] 790.124736 750.015471 1279.063674 412.782879 941.866275 444.609124  
## [1093] 423.374149 20.490547 968.238598 229.509877 19.931718 1666.667587  
## [1099] 1278.662544 1095.013007 1105.478355 35.955967 748.827854 448.712151  
## [1105] 1166.970707 768.123155 3521.646183 1071.938823 1481.954503 270.577226  
## [1111] 345.278623 1132.600228 8.944489 417.252403 997.610248 123.665235  
## [1117] 2620.707484 724.269930 55.835485 664.383106 845.111505 829.292980  
## [1123] 1098.494043 586.134097 582.121031 75.717085 1034.798856 705.692214  
## [1129] 757.845838 212.182497 1182.193899 883.149951 301.526549 2376.942107  
## [1135] 1555.403159 1734.493116 383.597261 8.762431 16.041937 2891.639236  
## [1141] 84.405979 205.039433 307.906888 282.863021 132.326413 681.034816  
## [1147] 1918.514934 1304.705669 285.062715 980.225908 168.453306 304.153325  
## [1153] 620.670854 799.017210 875.337987 70.288161 893.065858 741.352354  
## [1159] 251.321360 1734.959190 313.068114 457.008989 1040.097428 2411.733014  
## [1165] 380.794360 1203.877979 351.700601 54.799574 501.663180 1971.006719  
## [1171] 511.130405 1728.210782 198.463223 101.543436 67.700032 31.276636  
## [1177] 741.376191 919.299718 258.973725 860.629698 6931.182154 1795.891540  
## [1183] 964.917429 1356.905424 1385.582681 313.435143 2032.375099 759.480781  
## [1189] 187.005408 1581.104915 3606.210825 1638.435145 1219.821433 487.972635  
## [1195] 910.658285 1014.158259 57.309293 124.208892 1650.443395 472.067083  
## [1201] 925.867314 1636.821434 468.768225 816.227181 1065.671682 339.595701  
## [1207] 525.113232 4964.286086 2691.781874 886.685847 108.007443 520.936201  
## [1213] 172.104503 289.560641 460.603910 1091.698977 510.428820 221.931265  
## [1219] 245.780882 1633.986692 118.775352 639.771785 247.153807 1086.654152  
## [1225] 271.508078 209.662078 168.914515 197.805181 1261.543304 936.016948  
## [1231] 53.876748 6340.867381 765.871007 180.747478 42.114262 13.285517  
## [1237] 559.616254 481.564683 200.724953 728.133721 1045.858509 436.463230  
## [1243] 1191.889445 47.732019 232.204055 419.648577 2455.933541 1019.274035  
## [1249] 2636.337489 35.590212 478.202465 605.354929 874.816436 1219.825062  
## [1255] 711.686072 523.762683 339.703331 936.598827 979.704030 122.002139  
## [1261] 258.848108 1463.702393 200.670433 461.524099 4211.729443 2138.033169  
## [1267] 40.584429 1737.928380 56.108658 226.426320 282.977360 155.773374  
## [1273] 710.382653 1408.250442 1223.502037 681.814357 3987.400341 608.710888  
## [1279] 61.623669 637.329947 2046.838915 91.438531 528.830100 466.323971  
## [1285] 527.814621 379.048041 805.300787 138.556910 1084.243206 21.823154  
## [1291] 1152.215510 117.040749 533.722678 815.006158 38.528843 171.813253  
## [1297] 651.546486 376.154619 207.906930 891.160490 998.237428 139.524320  
## [1303] 233.069272 1227.900657 479.081793 28.841300 26.627983 779.883725  
## [1309] 1501.568139 4508.881165 1683.995658 486.774282 277.225238 1051.942897  
## [1315] 525.897905 44.825312 124.900910 2346.397938 830.561868 1217.397475  
## [1321] 1441.579631 914.886257 525.107824 1049.480454 378.293104 1827.823523  
## [1327] 6003.843459 22.355164 1136.961503 1122.500669 459.863526 602.458378  
## [1333] 256.894436 998.795195 2503.400507 308.672265 172.351191 846.998342  
## [1339] 318.093891 99.191224 251.011286 30.584930 896.821793 1717.768813  
## [1345] 3522.958022 734.924519 519.697601 880.832446 620.756907 246.043646  
## [1351] 431.945906 907.639459 873.879149 143.071154 1038.607957 5018.902511  
## [1357] 116.943819 528.239287 3084.440099 242.892787 3177.789847 2118.272748  
## [1363] 1710.963201 1774.733671 101.277965 827.288183 289.379503 574.313285  
## [1369] 2156.116978 92.332617 795.360064 50.761991 821.273767 788.851641  
## [1375] 2772.593668 1824.648787 620.866103 973.328152 414.038994 371.894619  
## [1381] 315.153160 106.076728 1496.676101 2473.081221 816.797394 196.062265  
## [1387] 1157.529504 175.271371 960.031631 671.603103 102.502545 1482.067835  
## [1393] 235.958574 608.513774 1203.205864 128.048605 1392.831315 548.272353  
## [1399] 307.513439 2987.109213 1445.363930 984.576178 989.444523 474.527782  
## [1405] 2424.882322 3242.521247 113.530282 173.358219 1142.506375 67.014453  
## [1411] 1179.807352 423.520954 250.539707 725.245015 1726.904041 625.885450  
## [1417] 2094.334010 285.800793 1089.879422 215.690010 371.194415 235.404940  
## [1423] 1409.685204 3598.969395 1904.262146 883.828162 81.368227 257.541642  
## [1429] 968.166381 761.426490 3742.609866 866.670492 2270.503695 2520.604643  
## [1435] 40.997914 1986.725585 2245.965463 232.066310 407.638843 619.214551  
## [1441] 108.062653 329.203373 1185.131618 1125.093116 836.716373 1145.243945  
## [1447] 81.382415 564.591823 1245.182193 78.215606 78.098573 1451.681496  
## [1453] 138.732343 525.667966 1009.036033 1265.091190 2027.806507 216.952371  
## [1459] 5805.961890 833.109362 495.035510 1475.978243 248.984139 263.046058  
## [1465] 890.084896 672.873512 464.555940 11.741854 433.193139 1844.405060  
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## [1477] 51.262327 1712.779645 211.471813 1088.483486 84.210072 288.066820  
## [1483] 74.775593 85.224894 527.125941 2149.060625 1624.295481 781.781825  
## [1489] 566.258583 2989.131963 1942.196567 1316.020259 586.489181 969.676637  
## [1495] 2118.380430 958.611845 135.465877 1016.793913 1167.661660 3056.788429  
## [1501] 1970.581576 518.672865 594.668031 697.282423 144.147507 322.245730  
## [1507] 12.311541 379.532027 1211.016465 2413.937899 333.218698 928.295432  
## [1513] 580.969527 585.933929 712.743250 714.678186 328.852637 26.177835  
## [1519] 683.190048 9.141641 1079.263980 2291.373285 810.716752 27.986970  
## [1525] 508.447700 2024.490579 1934.315755 3271.448843 1163.558075 175.818264  
## [1531] 660.674002 764.902341 1245.663248 58.658460 178.799029 213.732991  
## [1537] 64.000306 65.279070 806.388713 1846.773736 30.641244 671.066712  
## [1543] 109.750083 501.110559 8.745684 660.412590 637.561760 821.318082  
## [1549] 1453.133129 666.740033 2033.180568 318.918811 244.544498 673.076042  
## [1555] 717.227092 647.943247 587.875876 1806.778155 269.468354 315.997586  
## [1561] 1190.103603 1354.326027 383.261473 399.687464 363.663061 115.251935  
## [1567] 198.582755 338.074071 475.260532 1085.108687 135.159970 470.720548  
## [1573] 577.824306 947.317170 342.781591 730.697151 5.847714 203.192948  
## [1579] 856.085846 297.102858 1175.479513 208.526508 97.627529 48.643073  
## [1585] 115.007546 454.481189 494.193331 595.389742 1730.825057 446.156151  
## [1591] 533.354872 2958.009642 281.004106 540.305125 189.097717 2050.667043  
## [1597] 3164.078806 2023.565667 762.881152 1255.810874 2192.592042 144.515716  
## [1603] 189.718468 723.842838 68.050405 1430.584114 265.998959 1713.187370  
## [1609] 252.472319 1103.837353 1425.415608 2486.676955 1077.136295 1214.889375  
## [1615] 1000.831223 573.760921 872.654371 1675.593542 2516.487077 854.345073  
## [1621] 1202.520701 35.784804 1244.866935 583.782992 452.489060 57.650673  
## [1627] 986.057584 1132.312229 823.714157 1342.707176 45.791199 819.155205  
## [1633] 1912.059869 10.417428 405.931599 3376.775138 35.003991 1110.920037  
## [1639] 2374.993772 390.659917 624.204588 1524.126829 1057.086890 787.819102  
## [1645] 2351.526923 78.453169 6.089976 2423.826257 305.628134 720.727177  
## [1651] 1169.329713 280.183130 363.728900 1430.700899 543.719062 2187.204282  
## [1657] 1194.715000 234.729653 1439.650467 226.987347 561.122251 33.107517  
## [1663] 164.880348 947.152593 1201.179306 804.481311 1174.565146 13.119710  
## [1669] 108.467197 395.667349 199.639744 1433.465034 10.578641 53.385269  
## [1675] 1025.040883 74.884613 62.153532 815.599416 2995.557039 3893.264061  
## [1681] 2271.846157 486.222450 4.884428 2190.244433 1580.766935 213.540879  
## [1687] 851.403720 1175.524596 908.562299 1549.062208 723.564449 2460.010863  
## [1693] 1228.213713 73.830083 1131.692720 324.364600 1364.862602 587.835127  
## [1699] 206.567657 1407.601616 1816.819451 1238.684517 61.098419 26.268344  
## [1705] 415.590419 1678.828494 1807.174808 459.156563 285.761081 2931.772373  
## [1711] 436.846201 877.068679 408.104778 384.403343 578.287625 592.024253  
## [1717] 692.073754 1866.154919 4015.796092 289.646835 148.275038 2261.441128  
## [1723] 124.761215 2320.260756 2372.388621 121.593049 1901.961088 126.050488  
## [1729] 355.513157 704.631094 1060.054047 223.965380 191.976071 1537.703934  
## [1735] 634.253671 896.164887 665.776658 3722.860521 1106.140803 420.507198  
## [1741] 426.035197 1779.963979 251.392445 280.232939 407.647540 2146.837960  
## [1747] 1948.577094 1375.690686 64.672196 3402.426579 1854.503323 238.013622  
## [1753] 54.465101 1102.336959 2970.897990 1559.883678 421.152630 5.255777  
## [1759] 1269.048026 1191.451136 800.314400 69.607745 766.350823 1349.085068  
## [1765] 136.215258 223.936348 3196.257143 172.998708 586.257348 956.898525  
## [1771] 358.129580 1417.210453 148.107354 352.653631 264.824924 1954.470994  
## [1777] 22.652686 1333.251099 548.502520 1706.428660 620.461777 252.901389  
## [1783] 565.320314 4146.891200 558.149450 401.734172 300.637925 2205.672119  
## [1789] 1399.405920 1011.394058 2622.228379 1241.827056 80.676591 529.338402  
## [1795] 729.193386 2063.600811 308.087562 639.482260 6.865651 37.708424  
## [1801] 2482.009343 265.052496 1017.977458 1184.378930 1354.245476 287.970969  
## [1807] 456.287606 18.485769 1686.841726 746.605510 8.344700 712.324677  
## [1813] 1447.544699 34.975774 285.115851 1249.158985 471.239237 1012.180656  
## [1819] 1184.656511 1203.105936 3378.554643 369.211804 211.763229 783.769193  
## [1825] 993.095413 90.472897 3255.767755 89.474862 1520.050525 1641.271185  
## [1831] 863.001872 559.197974 346.050095 56.828716 40.770680 387.067254  
## [1837] 2113.834058 927.838820 691.806220 969.134279 1085.974484 1301.771426  
## [1843] 233.077208 626.909196 964.643213 304.755733 3042.244121 50.636427  
## [1849] 1836.769991 472.245671 1749.806431 70.181236 2084.770293 1294.299549  
## [1855] 1218.439296 614.816849 450.024134 336.141501 355.059648 3758.291886  
## [1861] 2163.221123 1754.784383 2671.648340 2563.858844 842.827328 652.476676  
## [1867] 159.357289 446.542994 75.658003 1214.809928 894.051711 2302.359015  
## [1873] 232.079730 479.090326 389.489580 146.249597 490.455286 265.248539  
## [1879] 2316.059304 175.308047 640.460769 878.978253 78.591861 91.585036  
## [1885] 101.448668 371.363365 413.567180 602.551313 2454.166220 2494.246740  
## [1891] 937.226755 1354.662055 2225.840828 510.326429 1744.983771 391.583595  
## [1897] 672.205910 1817.295124 10.652883 1591.103751 2339.892371 4268.165956  
## [1903] 670.491141 24.283437 1358.633944 1308.413205 924.184389 277.323225  
## [1909] 382.219842 1295.730024 2240.681486 1799.757067 812.538325 49.619422  
## [1915] 50.921321 2695.845416 503.732207 220.020368 1144.227063 45.016699  
## [1921] 784.496965 1478.001906 241.550445 119.724737 1747.319575 2926.433302  
## [1927] 1219.989474 191.870539 191.322645 311.656027 957.391075 326.464755  
## [1933] 1497.396951 1620.835577 1469.573042 1552.179263 1638.552960 712.128620  
## [1939] 3.406694 1945.627802 315.516032 341.382997 4121.188792 1045.704060  
## [1945] 57.921200 509.220822 343.640594 1968.226834 1225.350755 863.673922  
## [1951] 1917.335992 145.089531 299.098720 155.515563 626.238947 1279.546954  
## [1957] 1200.718948 103.595993 371.145642 85.576156 2404.343262 1311.462920  
## [1963] 446.851185 732.535926 119.994044 862.219202 220.851911 227.174415  
## [1969] 660.568765 558.887269 52.551372 120.413005 687.231968 1590.304824  
## [1975] 1543.265900 5345.392070 603.197488 47.354042 2537.892218 571.885309  
## [1981] 1180.585210 1290.128579 63.578747 163.811491 885.754752 93.689587  
## [1987] 89.115971 567.674640 1744.676878 889.412369 131.227266 169.133418  
## [1993] 1043.766798 745.063356 322.964283 1469.116291 2293.342592 1769.143595  
## [1999] 684.269956 589.671157

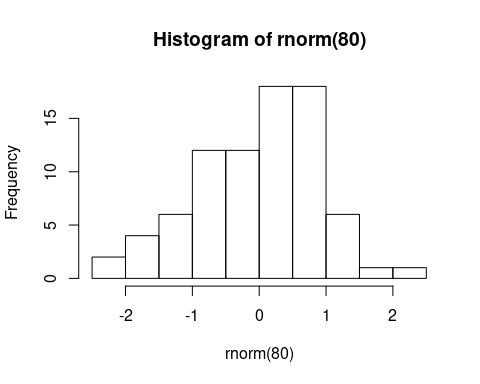
c( ii[ ii\_match[1:3] ], function(x) to[x,] )

## [[1]]  
## [1] 109.7128  
##   
## [[2]]  
## [1] 195.2838  
##   
## [[3]]  
## [1] 1350.778  
##   
## [[4]]  
## function(x) to[x,]

included <- c(unlist( ii ))  
dim( included )

## NULL

hist(rnorm(80))



fruits <- c(  
 type = c("apple", "orange", "apple", "orange", "orange", "orange"),  
 year = c(2010, 2010, 2012, 2010, 2010, 2012),  
 size = factor(  
 c("XS", "S", "M", "S", "S", "M"),  
 levels = c("XS", "S", "M", "L")  
 ),  
 weights = rnorm(10)  
)  
  
# All possible combinations ---------------------------------------  
# Note that all defined, but not necessarily present, levels of the  
# factor variable `size` are retained.  
fruits

## type1 type2 type3   
## "apple" "orange" "apple"   
## type4 type5 type6   
## "orange" "orange" "orange"   
## year1 year2 year3   
## "2010" "2010" "2012"   
## year4 year5 year6   
## "2010" "2010" "2012"   
## size1 size2 size3   
## "1" "2" "3"   
## size4 size5 size6   
## "2" "2" "3"   
## weights1 weights2 weights3   
## "-0.526490637930325" "1.95794978012126" "-0.521030019914641"   
## weights4 weights5 weights6   
## "-0.2367012813145" "-0.27530865067738" "-1.12451080050424"   
## weights7 weights8 weights9   
## "1.28268498364809" "-0.120909580876951" "1.15911632570966"   
## weights10   
## "-0.240940437971176"

# Only combinations that already appear in the data ---------------  
# Other uses -------------------------------------------------------  
# Use with `full\_seq()` to fill in values of continuous variables  
# Use `anti\_join()` to determine which observations are missing  
all <- fruits   
all

## type1 type2 type3   
## "apple" "orange" "apple"   
## type4 type5 type6   
## "orange" "orange" "orange"   
## year1 year2 year3   
## "2010" "2010" "2012"   
## year4 year5 year6   
## "2010" "2010" "2012"   
## size1 size2 size3   
## "1" "2" "3"   
## size4 size5 size6   
## "2" "2" "3"   
## weights1 weights2 weights3   
## "-0.526490637930325" "1.95794978012126" "-0.521030019914641"   
## weights4 weights5 weights6   
## "-0.2367012813145" "-0.27530865067738" "-1.12451080050424"   
## weights7 weights8 weights9   
## "1.28268498364809" "-0.120909580876951" "1.15911632570966"   
## weights10   
## "-0.240940437971176"

# Use with `right\_join()` to fill in missing rows  
fruits

## type1 type2 type3   
## "apple" "orange" "apple"   
## type4 type5 type6   
## "orange" "orange" "orange"   
## year1 year2 year3   
## "2010" "2010" "2012"   
## year4 year5 year6   
## "2010" "2010" "2012"   
## size1 size2 size3   
## "1" "2" "3"   
## size4 size5 size6   
## "2" "2" "3"   
## weights1 weights2 weights3   
## "-0.526490637930325" "1.95794978012126" "-0.521030019914641"   
## weights4 weights5 weights6   
## "-0.2367012813145" "-0.27530865067738" "-1.12451080050424"   
## weights7 weights8 weights9   
## "1.28268498364809" "-0.120909580876951" "1.15911632570966"   
## weights10   
## "-0.240940437971176"