R Notebook

## -- Attaching packages ------------------------------------------------------------------------- tidyverse 1.2.1 --

## v ggplot2 3.0.0 v purrr 0.2.5  
## v tibble 1.4.2 v dplyr 0.7.6  
## v tidyr 0.8.1 v stringr 1.3.1  
## v readr 1.1.1 v forcats 0.3.0

## -- Conflicts ---------------------------------------------------------------------------- tidyverse\_conflicts() --  
## x dplyr::filter() masks stats::filter()  
## x dplyr::lag() masks stats::lag()

## Loading required package: magrittr

##   
## Attaching package: 'magrittr'

## The following object is masked from 'package:purrr':  
##   
## set\_names

## The following object is masked from 'package:tidyr':  
##   
## extract

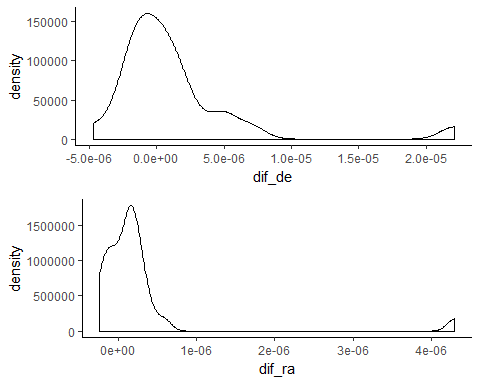
## Se cruzan los datos de Hyades identificadas dentro de Hipparcos para analizar con mayor detenimiento.

idcruz <- idcruz %>%  
 mutate(HIP\_2 = sub("HIP ","", HIP))  
   
  
hip\_hyades <- hip %>%  
 mutate(HIP = as.character(HIP)) %>%  
 inner\_join(., idcruz, by = c("HIP" = "HIP\_2")) %>%  
 inner\_join(., symbad, by = c("HD" = "identifier")) %>%  
 mutate(dif\_ra = RA\_J2000.x - RA\_J2000.y) %>%  
 mutate(dif\_de = DE\_J2000.x - DE\_J2000.y)  
  
hip\_hyades

## # A tibble: 24 x 21  
## HIP RA\_J2000.x DE\_J2000.x Plx pmRA pmDE Vmag `B-V` HD HIP.y  
## <chr> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl> <chr> <chr>  
## 1 15310 3.29 7.69 21.6 170. -7.48 7.78 0.617 HD 20~ HIP ~  
## 2 19504 4.18 18.4 23.2 124. -31.4 6.61 0.427 HD 26~ HIP ~  
## 3 19781 4.24 14.6 21.9 106. -19.9 8.45 0.693 HD 26~ HIP ~  
## 4 19796 4.24 10.7 21.1 120. -5.22 7.11 0.514 HD 26~ HIP ~  
## 5 20349 4.36 21.0 19.6 105. -36 6.79 0.434 HD 27~ HIP ~  
## 6 20350 4.36 18.4 19.8 111. -31.7 6.8 0.441 HD 27~ HIP ~  
## 7 20357 4.36 14.4 19.5 105. -19.1 6.6 0.412 HD 27~ HIP ~  
## 8 20441 4.38 16.8 27.0 173. 4.67 7.86 0.677 HD 27~ HIP ~  
## 9 20480 4.39 21.4 20.6 99.8 -39.1 8.84 0.758 HD 27~ HIP ~  
## 10 20491 4.39 24.4 20.0 93.1 -45.1 7.18 0.462 HD 27~ HIP ~  
## # ... with 14 more rows, and 11 more variables: n <dbl>,  
## # prob\_member <dbl>, Otype <chr>, RA <chr>, RA\_J2000.y <dbl>, DE <chr>,  
## # DE\_J2000.y <dbl>, Sp\_type <chr>, idHip <lgl>, dif\_ra <dbl>,  
## # dif\_de <dbl>

## Se analiza la distribuci?n de los errores.

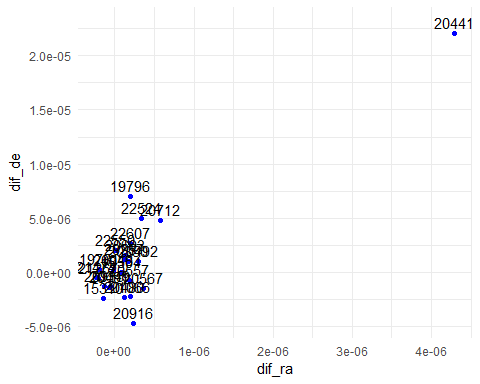
p1 <- ggplot(hip\_hyades,aes(x=dif\_de)) +  
 geom\_density() +  
 theme\_classic()  
  
p2 <- ggplot(hip\_hyades,aes(x=dif\_ra)) +  
 geom\_density() +  
 theme\_classic()  
  
ggarrange(p1, p2, nrow = 2, ncol = 1)



Las distribuciones parecen ser normales excepto por la presencia de un outlier en ambos casos. La diferencia entre los valores de RA parecen tener menor dispersi?n que la distribuci?n de las diferencias de los valores de DE.

A continuaci?n se plotean las Hyades en dos ejes de acuerdo a las diferencias presentan en su posici?n en ambos cat?logos.

ggplot(hip\_hyades,aes(y=dif\_de, x = dif\_ra)) +  
 geom\_point(colour = "blue") +  
 geom\_text(aes(label=HIP), nudge\_y = 0.000001) +  
 theme\_minimal()

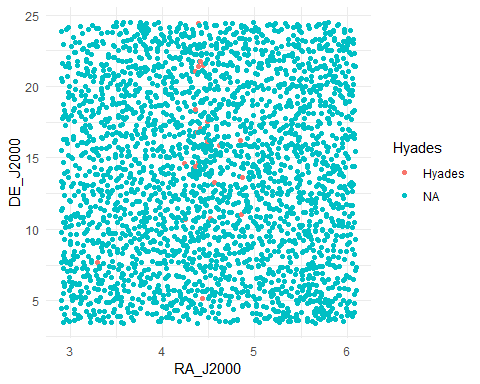


En el siguiente gr?fico se puede observar como en general el error de posicionamiento de la estrella en ambos cat?logos se encuentra mayormente concentrado en el 6to decimal de la medici?n, excepto para la estrella 20441 que tiene su error en el 5to decimal.

A continuaci?n se filtra el dataframe para mostrar algunos de los casos reflejados en el gr?fico anterior.

## # A tibble: 4 x 7  
## HIP RA\_J2000.x RA\_J2000.y dif\_ra DE\_J2000.x DE\_J2000.y dif\_de  
## <chr> <dbl> <dbl> <dbl> <dbl> <dbl> <dbl>  
## 1 19796 4.24 4.24 0.000000200 10.7 10.7 7.03e-6  
## 2 20441 4.38 4.38 0.00000429 16.8 16.8 2.21e-5  
## 3 20916 4.48 4.48 0.000000233 16.2 16.2 -4.69e-6  
## 4 22524 4.85 4.85 0.000000339 16.2 16.2 4.97e-6

## En el siguiente gr?fico a continuaci?n se muestran las estrellas que fueron identificadas como Hyades efectivamente en el Cat?logo Hipparcos.



## Preparacion de la grilla espacial

## numero de intervalos (igual sobre AR y DE)

## Calculo de la ubicacion de las estrellas de Hipparcos en la grilla

## Nuestro vecindario estará delimitado por un cuadrado 3x3

## Tambien calculamos para las Hyades de Symbad su ubicación en la grilla

# Se crean dos funciones auxiliares

## Obtenemos las estrellas de Hipparcos mas cercanas a las de Symbad y su distancia

## Iteramos por cada estrella

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# El vector de distancias

symbad.dists

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## [6] 7.320646e-02 2.673746e-06 1.478408e-01 9.049555e-02 2.084067e-02  
## [11] 1.137592e-01 6.968292e-02 1.834982e-06 4.338473e-06 9.080270e-02  
## [16] 1.010757e-01 7.866831e-02 1.887815e-02 5.644241e-02 5.815895e-02  
## [21] 2.258871e-06 9.810529e-02 4.543936e-02 5.781161e-02 1.893136e-01  
## [26] 1.723598e-01 4.700240e-06 7.423020e-02 2.968915e-02 3.215031e-07  
## [31] 1.561259e-06 4.477152e-02 6.434852e-02 3.207481e-06 1.361358e-01  
## [36] 5.923640e-07 6.978299e-02 9.512293e-02 7.529981e-02 1.279238e-06  
## [41] 6.196128e-06 4.606316e-02 4.159973e-02 7.248578e-02 1.016522e-01  
## [46] 2.308506e-06 3.762516e-02 8.353333e-02 1.120002e-01 1.191624e-01  
## [51] 1.097359e-06 5.839118e-02 1.007083e-02 6.064999e-02 2.891244e-06  
## [56] 1.121947e-06 1.290493e-01 6.527762e-02 7.939957e-02 1.225154e-01  
## [61] 8.930108e-02 3.270868e-02 6.076502e-02 7.125237e-02 7.546154e-07  
## [66] 3.122519e-06 5.037794e-02 1.135440e-01 5.767171e-02 6.627559e-02  
## [71] 4.684818e-02 4.338675e-02 1.383980e-01 3.258768e-06 4.102139e-02  
## [76] 4.810826e-02 1.406061e-02 4.435312e-02 6.199558e-02 3.002489e-06  
## [81] 1.200681e-06 1.029689e-01 1.233344e-01 2.249702e-05 5.195558e-07  
## [86] 8.731532e-02 6.117421e-07 8.888888e-08 7.030623e-06 2.228463e-07  
## [91] 7.507977e-02 3.621780e-07 1.561739e-02 5.340245e-02 9.380305e-02  
## [96] 8.574613e-02 4.259343e-06 1.364604e-01 2.493729e-01 4.617498e-02  
## [101] 1.387587e-01 8.448844e-02 5.304431e-02 4.983758e-06 2.388992e-06  
## [106] 6.622691e-02 2.952818e-06 1.552902e-01 1.053486e-01 7.759013e-02  
## [111] 9.124315e-02 2.975094e-02 4.812586e-06 3.885299e-02 6.115150e-07  
## [116] 8.044821e-07 1.387511e-02 2.931627e-02 1.331212e-02 7.299846e-02  
## [121] 4.392588e-02 9.650690e-02 6.389553e-02 9.357770e-02 1.167315e-06  
## [126] 1.164187e-01 4.244620e-02 1.257091e-06 9.012230e-02 3.927570e-02  
## [131] 4.721481e-02 7.786175e-02 6.041133e-02 2.653508e-03 9.289027e-02  
## [136] 5.516168e-02 4.719914e-02 9.445373e-02 7.425236e-06 5.163675e-02  
## [141] 7.521535e-02 1.378023e-01 4.159090e-02 1.726169e-06 1.711829e-01  
## [146] 8.122906e-02 7.297684e-02 1.073316e-06 8.148088e-02 1.390488e-06  
## [151] 3.243702e-02 1.506702e-02 4.079596e-02 2.796093e-02 8.266302e-02  
## [156] 5.267241e-07 6.612201e-02 8.433398e-02 1.018319e-01 6.950931e-02  
## [161] 2.055563e-06 4.844943e-02 1.093797e-01 8.233758e-02 7.997935e-02  
## [166] 1.078409e-01 2.509857e-07 1.708954e-06 1.517196e-06 4.652562e-02  
## [171] 1.447275e-01 7.720823e-07 6.378084e-02 2.365525e-06 1.115674e-01  
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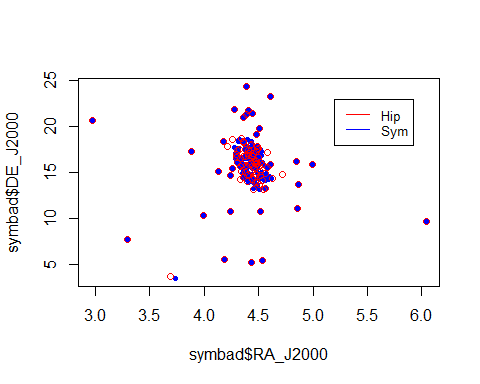
# El dataframe de estrellas más cercanas en Hipparcos a las de Symbad.

symbad.mas.vecina

## HIP RA\_J2000 DE\_J2000 Plx pmRA pmDE Vmag B\_V  
## 1 20197 4.329060 14.273670 12.93 80.17 -217.40 7.51 0.991  
## 2 20350 4.358964 18.417582 19.83 111.05 -31.69 6.80 0.441  
## 3 20877 4.473992 16.359672 16.78 8.12 17.79 4.96 1.137  
## 4 20899 4.480082 17.285464 21.09 105.58 -30.05 7.83 0.609  
## 5 21267 4.562956 13.251883 22.80 101.77 -17.93 6.62 0.429  
## 6 20877 4.473992 16.359672 16.78 8.12 17.79 4.96 1.137  
## 7 22607 4.863886 13.655155 23.91 106.84 -16.00 6.30 0.502  
## 8 20978 4.499369 16.672840 24.71 105.04 -28.33 9.08 0.865  
## 9 20827 4.463066 14.417748 17.29 101.43 -20.00 9.48 0.929  
## 10 20740 4.444154 14.220608 7.92 -39.05 54.76 9.23 0.527  
## 11 20350 4.358964 18.417582 19.83 111.05 -31.69 6.80 0.441  
## 12 20261 4.343420 15.095453 21.20 108.79 -20.67 5.26 0.225  
## 13 20815 4.459969 15.589188 21.83 103.54 -25.16 7.41 0.537  
## 14 13834 2.968117 20.668733 31.41 234.79 -31.64 5.80 0.415  
## 15 21039 4.510803 15.691879 22.55 104.17 -24.29 5.47 0.258  
## 16 21082 4.518664 15.105037 7.16 42.72 -52.75 6.28 1.725  
## 17 20916 4.483270 16.159092 20.58 90.28 -25.47 6.59 0.536  
## 18 20850 4.467899 13.867942 21.29 106.16 -17.59 9.02 0.839  
## 19 20679 4.429878 18.017272 20.79 112.62 -35.79 8.99 0.935  
## 20 20827 4.463066 14.417748 17.29 101.43 -20.00 9.48 0.929  
## 21 21066 4.515881 10.751768 22.96 104.19 -10.52 7.03 0.472  
## 22 20877 4.473992 16.359672 16.78 8.12 17.79 4.96 1.137  
## 23 20850 4.467899 13.867942 21.29 106.16 -17.59 9.02 0.839  
## 24 20935 4.489043 17.544935 23.25 104.88 -31.65 7.02 0.526  
## 25 20455 4.382248 17.542514 21.29 107.75 -28.84 3.77 0.983  
## 26 21542 4.625482 14.302022 7.59 -8.95 -16.30 9.03 0.642  
## 27 20916 4.483270 16.159092 20.58 90.28 -25.47 6.59 0.536  
## 28 20894 4.477706 15.870883 21.89 108.66 -26.39 3.40 0.179  
## 29 21132 4.529901 14.154105 28.36 -330.66 -352.00 10.33 0.432  
## 30 21053 4.512999 16.148696 24.28 98.20 -22.75 6.50 0.428  
## 31 20693 4.432594 5.150145 22.03 96.32 4.55 7.36 0.509  
## 32 21039 4.510803 15.691879 22.55 104.17 -24.29 5.47 0.258  
## 33 20485 4.390356 15.763113 21.08 126.22 -30.50 10.47 1.231  
## 34 20215 4.331905 16.522588 23.27 121.27 -36.65 6.85 0.509  
## 35 19651 4.210596 17.834659 3.52 -2.76 -5.92 8.50 1.430  
## 36 21267 4.562956 13.251883 22.80 101.77 -17.93 6.62 0.429  
## 37 20713 4.439095 15.618265 20.86 114.66 -33.30 4.48 0.262  
## 38 21036 4.510379 13.724402 21.84 108.06 -19.71 5.40 0.263  
## 39 20350 4.358964 18.417582 19.83 111.05 -31.69 6.80 0.441  
## 40 20349 4.358791 21.039877 19.55 105.20 -36.00 6.79 0.434  
## 41 21152 4.534669 5.410035 23.13 114.15 6.17 6.37 0.420  
## 42 20719 4.440169 16.853322 21.76 103.64 -17.58 8.04 0.651  
## 43 20605 4.413349 15.874718 24.41 102.58 -26.06 11.66 1.408  
## 44 20350 4.358964 18.417582 19.83 111.05 -31.69 6.80 0.441  
## 45 21082 4.518664 15.105037 7.16 42.72 -52.75 6.28 1.725  
## 46 20480 4.389536 21.379095 20.63 99.77 -39.07 8.84 0.758  
## 47 21137 4.531044 15.851560 22.25 107.59 -32.38 6.01 0.338  
## 48 20577 4.407868 16.886166 20.73 110.89 -24.72 7.79 0.599  
## 49 20815 4.459969 15.589188 21.83 103.54 -25.16 7.41 0.537  
## 50 20255 4.340308 18.742608 21.12 119.59 -48.17 6.11 0.404  
## 51 20492 4.392314 14.670478 21.23 107.57 -18.24 9.11 0.855  
## 52 21036 4.510379 13.724402 21.84 108.06 -19.71 5.40 0.263  
## 53 20086 4.306109 17.421641 19.57 120.57 -40.55 10.01 1.097  
## 54 20527 4.398448 14.052113 22.57 115.90 -15.21 10.89 1.288  
## 55 20661 4.427033 15.941010 21.47 104.62 -28.83 6.44 0.509  
## 56 21317 4.576475 15.504620 23.19 100.66 -28.04 7.90 0.631  
## 57 19651 4.210596 17.834659 3.52 -2.76 -5.92 8.50 1.430  
## 58 20542 4.401600 17.444130 22.36 109.99 -33.47 4.80 0.154  
## 59 20440 4.378936 15.056091 21.45 111.98 -19.88 6.97 0.518  
## 60 20762 4.448428 13.138172 21.83 104.54 -18.10 10.48 1.146  
## 61 20810 4.458986 15.365354 8.66 86.29 -25.06 11.05 0.808  
## 62 21132 4.529901 14.154105 28.36 -330.66 -352.00 10.33 0.432  
## 63 20455 4.382248 17.542514 21.29 107.75 -28.84 3.77 0.983  
## 64 20215 4.331905 16.522588 23.27 121.27 -36.65 6.85 0.509  
## 65 20577 4.407868 16.886166 20.73 110.89 -24.72 7.79 0.599  
## 66 20951 4.492113 17.893182 24.19 107.00 -33.31 8.95 0.831  
## 67 20485 4.390356 15.763113 21.08 126.22 -30.50 10.47 1.231  
## 68 21082 4.518664 15.105037 7.16 42.72 -52.75 6.28 1.725  
## 69 20741 4.444478 16.746899 21.42 110.29 -27.82 8.10 0.664  
## 70 20350 4.358964 18.417582 19.83 111.05 -31.69 6.80 0.441  
## 71 20648 4.424829 17.927910 22.05 108.26 -32.47 4.30 0.049  
## 72 20810 4.458986 15.365354 8.66 86.29 -25.06 11.05 0.808  
## 73 19651 4.210596 17.834659 3.52 -2.76 -5.92 8.50 1.430  
## 74 21459 4.608094 23.340855 22.60 109.97 -53.86 6.01 0.380  
## 75 20567 4.406187 17.078951 18.74 99.08 -27.93 6.96 0.450  
## 76 20898 4.479738 14.819518 4.67 -6.54 -0.39 7.98 0.295  
## 77 20577 4.407868 16.886166 20.73 110.89 -24.72 7.79 0.599  
## 78 20952 4.492413 13.894709 7.68 176.16 -15.25 7.72 1.216  
## 79 20215 4.331905 16.522588 23.27 121.27 -36.65 6.85 0.509  
## 80 19261 4.128329 15.162788 21.27 127.06 -22.75 6.02 0.397  
## 81 20357 4.359665 14.409789 19.46 105.19 -19.11 6.60 0.412  
## 82 21090 4.519703 14.689795 10.58 38.90 -0.49 8.17 0.502  
## 83 20261 4.343420 15.095453 21.20 108.79 -20.67 5.26 0.225  
## 84 20441 4.379106 16.791040 26.96 173.30 4.67 7.86 0.677  
## 85 20455 4.382248 17.542514 21.29 107.75 -28.84 3.77 0.983  
## 86 20971 4.496701 17.677596 4.85 4.02 -8.74 7.73 0.240  
## 87 18170 3.886124 17.327083 24.14 143.97 -29.93 5.97 0.354  
## 88 19504 4.178435 18.423253 23.22 123.92 -31.41 6.61 0.427  
## 89 19796 4.242873 10.701388 21.08 119.81 -5.22 7.11 0.514  
## 90 20948 4.491764 17.863163 21.59 105.72 -32.56 6.90 0.451  
## 91 21365 4.583991 17.201232 3.33 -5.66 -1.29 6.73 1.833  
## 92 19781 4.240458 14.625035 21.91 105.61 -19.86 8.45 0.693  
## 93 20679 4.429878 18.017272 20.79 112.62 -35.79 8.99 0.935  
## 94 20899 4.480082 17.285464 21.09 105.58 -30.05 7.83 0.609  
## 95 21053 4.512999 16.148696 24.28 98.20 -22.75 6.50 0.428  
## 96 20719 4.440169 16.853322 21.76 103.64 -17.58 8.04 0.651  
## 97 28614 6.039722 9.647277 21.49 14.19 -37.44 4.12 0.170  
## 98 20810 4.458986 15.365354 8.66 86.29 -25.06 11.05 0.808  
## 99 21942 4.716474 14.814572 5.40 -24.30 11.59 6.69 0.904  
## 100 20713 4.439095 15.618265 20.86 114.66 -33.30 4.48 0.262  
## 101 20261 4.343420 15.095453 21.20 108.79 -20.67 5.26 0.225  
## 102 20971 4.496701 17.677596 4.85 4.02 -8.74 7.73 0.240  
## 103 20971 4.496701 17.677596 4.85 4.02 -8.74 7.73 0.240  
## 104 22524 4.846818 16.210455 19.30 83.97 -24.87 7.29 0.536  
## 105 19554 4.188967 5.523047 25.89 146.86 5.00 5.71 0.360  
## 106 20978 4.499369 16.672840 24.71 105.04 -28.33 9.08 0.865  
## 107 20889 4.476944 19.180432 21.04 107.23 -36.77 3.53 1.014  
## 108 20019 4.294150 16.947859 21.40 113.07 -21.39 8.32 0.756  
## 109 20011 4.290965 16.590655 6.24 -24.14 11.43 8.36 0.505  
## 110 20352 4.359133 16.802954 6.46 39.10 -105.18 9.17 0.554  
## 111 20885 4.476249 15.962181 20.66 104.76 -15.01 3.84 0.952  
## 112 20815 4.459969 15.589188 21.83 103.54 -25.16 7.41 0.537  
## 113 20712 4.438472 21.470434 21.54 105.82 -36.48 7.36 0.557  
## 114 20357 4.359665 14.409789 19.46 105.19 -19.11 6.60 0.412  
## 115 20885 4.476249 15.962181 20.66 104.76 -15.01 3.84 0.952  
## 116 19877 4.262857 15.400695 22.51 114.38 -22.07 6.31 0.400  
## 117 20011 4.290965 16.590655 6.24 -24.14 11.43 8.36 0.505  
## 118 21090 4.519703 14.689795 10.58 38.90 -0.49 8.17 0.502  
## 119 21273 4.564144 14.844424 21.39 103.69 -25.94 4.65 0.255  
## 120 20756 4.447537 17.028632 5.77 27.27 -52.56 6.86 1.494  
## 121 21090 4.519703 14.689795 10.58 38.90 -0.49 8.17 0.502  
## 122 21090 4.519703 14.689795 10.58 38.90 -0.49 8.17 0.502  
## 123 20197 4.329060 14.273670 12.93 80.17 -217.40 7.51 0.991  
## 124 20205 4.329890 15.627642 21.17 115.29 -23.86 3.65 0.981  
## 125 20205 4.329890 15.627642 21.17 115.29 -23.86 3.65 0.981  
## 126 20815 4.459969 15.589188 21.83 103.54 -25.16 7.41 0.537  
## 127 21090 4.519703 14.689795 10.58 38.90 -0.49 8.17 0.502  
## 128 20935 4.489043 17.544935 23.25 104.88 -31.65 7.02 0.526  
## 129 21090 4.519703 14.689795 10.58 38.90 -0.49 8.17 0.502  
## 130 21039 4.510803 15.691879 22.55 104.17 -24.29 5.47 0.258  
## 131 20899 4.480082 17.285464 21.09 105.58 -30.05 7.83 0.609  
## 132 20877 4.473992 16.359672 16.78 8.12 17.79 4.96 1.137  
## 133 21179 4.540459 13.113232 17.55 102.37 -18.77 11.00 1.194  
## 134 20019 4.294150 16.947859 21.40 113.07 -21.39 8.32 0.756  
## 135 20740 4.444154 14.220608 7.92 -39.05 54.76 9.23 0.527  
## 136 20605 4.413349 15.874718 24.41 102.58 -26.06 11.66 1.408  
## 137 20542 4.401600 17.444130 22.36 109.99 -33.47 4.80 0.154  
## 138 20827 4.463066 14.417748 17.29 101.43 -20.00 9.48 0.929  
## 139 18658 3.994582 10.330402 25.42 133.06 -3.50 6.35 0.417  
## 140 20485 4.390356 15.763113 21.08 126.22 -30.50 10.47 1.231  
## 141 20810 4.458986 15.365354 8.66 86.29 -25.06 11.05 0.808  
## 142 20877 4.473992 16.359672 16.78 8.12 17.79 4.96 1.137  
## 143 20290 4.348558 15.933871 3.63 -5.53 -27.68 9.44 0.587  
## 144 19934 4.275966 21.907469 19.48 105.61 -37.59 9.14 0.813  
## 145 17207 3.686256 3.611378 39.87 -41.66 -236.97 9.61 1.360  
## 146 21053 4.512999 16.148696 24.28 98.20 -22.75 6.50 0.428  
## 147 20019 4.294150 16.947859 21.40 113.07 -21.39 8.32 0.756  
## 148 20899 4.480082 17.285464 21.09 105.58 -30.05 7.83 0.609  
## 149 21132 4.529901 14.154105 28.36 -330.66 -352.00 10.33 0.432  
## 150 20491 4.391778 24.405402 20.04 93.11 -45.08 7.18 0.462  
## 151 21053 4.512999 16.148696 24.28 98.20 -22.75 6.50 0.428  
## 152 20019 4.294150 16.947859 21.40 113.07 -21.39 8.32 0.756  
## 153 20873 4.473167 14.740974 18.42 109.72 -21.27 5.90 0.325  
## 154 21542 4.625482 14.302022 7.59 -8.95 -16.30 9.03 0.642  
## 155 19847 4.254838 18.625422 9.15 -11.21 17.14 9.30 0.497  
## 156 21474 4.611312 15.869329 22.99 93.78 -23.02 6.64 0.442  
## 157 20756 4.447537 17.028632 5.77 27.27 -52.56 6.86 1.494  
## 158 20850 4.467899 13.867942 21.29 106.16 -17.59 9.02 0.839  
## 159 20827 4.463066 14.417748 17.29 101.43 -20.00 9.48 0.929  
## 160 20815 4.459969 15.589188 21.83 103.54 -25.16 7.41 0.537  
## 161 22550 4.853482 11.068026 20.15 87.60 -8.72 6.79 0.543  
## 162 20146 4.318891 17.524749 21.24 112.80 -29.89 8.47 0.721  
## 163 20810 4.458986 15.365354 8.66 86.29 -25.06 11.05 0.808  
## 164 21132 4.529901 14.154105 28.36 -330.66 -352.00 10.33 0.432  
## 165 20935 4.489043 17.544935 23.25 104.88 -31.65 7.02 0.526  
## 166 20336 4.356651 18.266323 1.67 4.01 -4.56 8.04 0.410  
## 167 21008 4.504992 19.840576 19.94 94.90 -28.30 7.09 0.470  
## 168 23214 4.995645 15.916734 23.09 87.21 -29.19 6.75 0.450  
## 169 20567 4.406187 17.078951 18.74 99.08 -27.93 6.96 0.450  
## 170 20978 4.499369 16.672840 24.71 105.04 -28.33 9.08 0.865  
## 171 20215 4.331905 16.522588 23.27 121.27 -36.65 6.85 0.509  
## 172 20557 4.404049 21.736244 24.47 119.10 -46.63 7.13 0.518  
## 173 20741 4.444478 16.746899 21.42 110.29 -27.82 8.10 0.664  
## 174 15310 3.292439 7.690152 21.64 170.41 -7.48 7.78 0.617  
## 175 20978 4.499369 16.672840 24.71 105.04 -28.33 9.08 0.865  
## 176 20082 4.305354 16.088341 20.01 121.88 -19.72 9.57 0.980  
## 177 20553 4.403460 14.758207 22.25 97.38 -33.51 7.58 0.604  
## 178 20741 4.444478 16.746899 21.42 110.29 -27.82 8.10 0.664

# Como se ven los datasets superpuestos

plot(symbad$RA\_J2000, symbad$DE\_J2000, pch=20, col="blue")  
points(symbad.mas.vecina$RA\_J2000, symbad.mas.vecina$DE\_J2000, pch=21, col="red")  
legend(5.2, 23, legend=c("Hip", "Sym"),col=c("red", "blue"), lty=1, cex=0.8)



## Podemos agregar la informacion obtenida a un dataframe Symbad aumentado

symbad.aumentado <- data.frame(symbad, dist=symbad.dists, cercanaHip=symbad.mas.vecina$HIP )

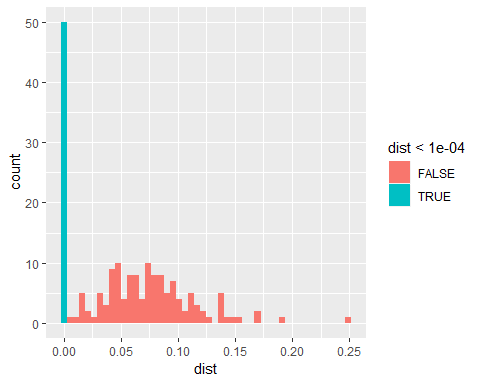
## Finalmente agregamos al dataframe aumentado el ID Hipparcos de la identificacion cruzada

symbad.aumentado$idcruzHip <- NA  
for(i in 1:nrow(symbad.aumentado)){  
 if(symbad.aumentado$identifier[i] %in% idcruz$HD) {  
 symbad.aumentado$idcruzHip[i] <- idcruz$HIP[idcruz$HD==symbad.aumentado$identifier[i]]  
 }  
}  
symbad.aumentado$idcruzHip <- as.numeric(sub("HIP ", "", symbad.aumentado$idcruzHip))

symbad.aumentado2 <- symbad.aumentado %>% left\_join(., hip[,c(1,2,3)], by = c("cercanaHip" = "HIP")) %>% mutate(dif\_ra = RA\_J2000.x - RA\_J2000.y) %>% mutate(dif\_de = DE\_J2000.x - DE\_J2000.y)

## Warning: Column `cercanaHip`/`HIP` joining factor and character vector,  
## coercing into character vector

ggplot(symbad.aumentado2, aes(x = dist, fill = dist<0.0001)) +  
 geom\_histogram(bins = 48)



En el siguiente gr?fico, se puede observar que las potenciales Hyades en el cat?logo de Hipparcos poseen distancias demasiado peque?as con respecto a su estrella candidata dentro del cat?logo Symbad. Al separar los grupos en funci?n de su distancia, teniendo en cuenta solamente distancias inferiores al 4 decimal como “verdaderas” Hyades, se puede observar que la poblaci?n celeste se concentra en su totalidad dentro del 1er bin de la distribuci?n.

A continuaci?n se filtra el listado final de Hyades tomando como referencia las distancias inferiores al 4to decimal.

symbad\_seleccion <- symbad.aumentado2 %>%  
 select(.,identifier , cercanaHip, idcruzHip, dist, dif\_ra, dif\_de) %>%  
 group\_by(cercanaHip) %>%  
 filter(dist < 0.001)  
  
symbad\_seleccion

## # A tibble: 50 x 6  
## # Groups: cercanaHip [50]  
## identifier cercanaHip idcruzHip dist dif\_ra dif\_de  
## <chr> <chr> <dbl> <dbl> <dbl> <dbl>  
## 1 HD 27534 20350 20350 0.00000104 -0.000000172 -0.00000103   
## 2 HD 30869 22607 22607 0.00000267 -0.000000194 -0.00000267   
## 3 V\* V993 Tau 20815 NA 0.00000183 -0.0000000778 0.00000183   
## 4 LTT 10969 13834 NA 0.00000434 0.000000211 0.00000433   
## 5 HD 28608 21066 21066 0.00000226 -0.000000200 0.00000225   
## 6 HD 28363 20916 20916 0.00000470 -0.000000233 0.00000469   
## 7 LP 15-640 21053 NA 0.000000322 -0.000000100 0.000000306  
## 8 HD 28069 20693 20693 0.00000156 -0.000000133 -0.00000156   
## 9 \* 55 Tau 20215 NA 0.00000321 -0.000000289 0.00000319   
## 10 HD 28911 21267 21267 0.000000592 0.000000206 0.000000556  
## # ... with 40 more rows

#write\_csv(symbad\_seleccion, "..//00.Datos\_y\_TP//Hyades\_seleccion.csv")