Clase 24

2022-06-16

Clase 24

```
set.seed(1013671265)
dfa <- rnorm_multi(n = 1265,
            mu = c(67, 30, 80, 320),
            sd = c(2, 3, 5, 10),
            varnames = c('Edad', 'DAP', 'RTO', 'ClolA'),
            r = c(0.4, 0.6, 0.5, 0.6, 0.7, 0.8))

dfa$hibrido <- round(runif(n = 1265, min = 0,max = 1.2))

w <- -0.1 * dfa$ClolA + 0.5 * dfa$DAP - 0.6 * dfa$RTO - 0.02 * dfa$Edad

dfa$Abortos <- ifelse(w > -65.5, '1', '0') #1 aborto, 2 No aborto
dfa$Abortos <- as.numeric(dfa$Abortos)
dfa
```

```
##          Edad      DAP      RTO    ClolA hibrido Abortos
## 1    66.10154 31.31879 81.47391 321.2461       1       0
## 2    66.47043 33.13766 82.66265 328.4512       1       0
## 3    67.57787 30.52702 77.11292 325.2363       0       1
## 4    67.91075 30.11775 81.71196 317.0871       1       0
## 5    65.94395 28.01281 80.21125 320.4867       0       0
## 6    69.89436 29.92587 82.49983 315.1770       0       0
## 7    66.29028 30.99144 80.06809 329.7225       0       0
## 8    70.96286 30.96399 80.86798 328.7355       0       0
## 9    66.29249 33.94020 86.55479 317.6616       1       0
## 10   67.99957 29.79265 82.58384 318.4294       1       0
## 11   69.15215 30.71290 76.01925 317.1650       1       1
## 12   68.62368 26.15316 81.05305 321.8096       0       0
## 13   69.29312 33.50226 88.09296 332.6338       1       0
## 14   67.21853 31.38212 76.83882 313.6587       1       1
## 15   68.56694 30.09852 80.06974 328.6203       0       0
## 16   63.35946 25.43201 75.67670 313.9846       1       1
## 17   65.79146 33.16317 81.03341 321.3184       0       1
## 18   66.72558 29.32224 81.30467 320.8358       0       0
## 19   68.31540 31.52152 79.98352 326.2609       0       0
## 20   66.72514 25.97024 81.28991 320.1135       0       0
## 21   70.28377 37.13871 88.89566 336.8576       1       0
## 22   65.04992 27.18003 70.30456 307.9957       1       1
## 23   66.77080 28.20701 77.30401 313.1295       1       1
## 24   64.53459 31.89863 75.68080 315.1778       1       1
## 25   67.25341 27.01271 76.32140 313.1813       0       1
## 26   63.89139 31.73909 78.49175 322.1275       1       1
## 27   66.53517 26.55795 78.56276 312.3457       1       0
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## 28   67.60843 32.36778 83.87373 329.7348       1       0
## 29   66.85616 27.90053 75.46867 315.6639       1       1
## 30   69.59533 36.57144 86.69133 336.8472       1       0
## 31   66.37635 30.74704 76.42592 320.8215       1       1
## 32   66.16875 24.89021 75.22307 306.7433       0       1
## 33   65.83227 28.27413 83.33032 312.3929       0       0
## 34   66.25003 29.58963 73.80367 310.5287       0       1
## 35   67.60470 32.75857 83.73590 329.0088       1       0
## 36   63.89295 29.70436 74.34002 316.6299       1       1
## 37   71.16471 33.96954 88.61628 339.8471       0       0
## 38   63.60494 25.57406 77.28284 309.1560       1       0
## 39   64.00154 33.27266 74.61087 321.2798       0       1
## 40   64.62363 31.50473 76.22103 316.6969       0       1
## 41   64.88988 25.72472 74.60733 308.5557       1       1
## 42   68.85811 25.24485 74.80532 312.1200       0       1
## 43   69.55632 31.25281 86.94618 325.0576       1       0
## 44   63.31775 29.21521 80.00869 316.7047       1       0
## 45   66.26723 32.16739 78.78375 326.2347       1       1
## 46   64.86154 29.42383 79.17972 316.2174       0       0
## 47   64.71019 33.40293 82.61555 330.5866       1       0
## 48   67.71880 29.42000 76.83199 315.0591       0       1
## 49   65.23453 25.51663 75.68964 303.5418       1       1
## 50   67.52403 34.00107 92.34054 327.6017       0       0
## 51   64.10198 29.48250 68.42952 306.4506       1       1
## 52   63.41059 25.60787 70.02593 304.7651       1       1
## 53   67.89683 28.13358 80.87195 321.4765       0       0
## 54   64.53566 32.45133 78.32433 321.6292       1       1
## 55   65.90644 29.72620 83.58986 313.3574       1       0
## 56   67.13426 25.84689 78.26020 309.7686       1       0
## 57   66.60424 31.69227 83.39538 318.4982       1       0
## 58   67.36773 33.12482 82.04794 320.0294       0       0
## 59   65.51658 27.12762 72.90403 311.6136       0       1
## 60   67.25443 30.88534 82.37291 314.0152       1       0
## 61   64.71240 32.11706 80.42404 324.7173       1       0
## 62   70.25248 35.39811 91.18421 347.6987       1       0
## 63   65.52009 32.65843 77.13896 324.3090       0       1
## 64   67.03123 28.24025 84.27767 321.0841       1       0
## 65   68.80831 31.63770 79.93139 321.7958       1       0
## 66   65.99282 33.85689 87.95660 333.2720       0       0
## 67   64.17383 25.13343 76.20739 315.4215       1       0
## 68   68.83604 26.47128 72.46016 304.6404       1       1
## 69   63.01379 23.19211 70.27006 299.7383       0       1
## 70   63.40265 27.24598 76.51650 320.5858       0       0
## 71   67.71076 29.24346 75.68649 310.0447       1       1
## 72   67.77557 28.90435 81.49179 315.7796       1       0
## 73   68.40103 30.81393 83.40773 321.1211       0       0
## 74   68.68049 28.77666 78.96988 319.2031       1       0
## 75   66.52203 32.66818 79.35547 322.3869       0       1
## 76   66.85761 34.92182 86.75360 328.3025       1       0
## 77   64.99705 25.71432 76.27083 312.9354       1       1
## 78   69.67581 32.86785 85.59066 326.7051       1       0
## 79   69.43967 31.99482 84.85348 328.7735       0       0
## 80   70.94812 35.00910 89.18990 344.6679       0       0
## 81   67.95524 30.21874 87.50122 333.6543       0       0
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## 82   67.82856 32.37335 84.63255 336.5389       0       0
## 83   68.59846 31.58607 78.33707 314.2037       0       1
## 84   66.37493 28.20784 72.19318 310.0186       0       1
## 85   69.09071 35.11503 84.97824 329.5972       1       0
## 86   64.77776 28.65797 70.87376 306.0822       1       1
## 87   66.42140 32.61673 82.65680 326.1900       1       0
## 88   68.94275 33.11195 76.72921 319.4579       0       1
## 89   65.39008 28.23882 75.77239 300.5253       1       1
## 90   65.66261 28.70072 69.89831 307.5235       1       1
## 91   66.61209 31.55391 80.16862 323.0336       0       0
## 92   68.84272 32.56394 88.18992 335.9848       0       0
## 93   67.30019 35.93931 86.36576 332.5839       0       0
## 94   66.06638 35.73798 80.92847 328.8496       0       1
## 95   65.39991 28.97160 69.89249 306.7604       1       1
## 96   69.70402 32.87220 82.04356 337.2597       0       0
## 97   69.29524 30.90582 88.14795 337.9536       0       0
## 98   70.12704 31.67770 80.95235 326.8450       0       0
## 99   68.28744 32.46466 80.16062 325.9542       1       0
## 100  65.69514 31.54029 78.58191 315.7842       1       1
## 101  66.88872 27.09623 71.74970 313.9119       0       1
## 102  66.79450 29.10225 82.69732 330.3519       1       0
## 103  69.09696 29.55886 81.73307 322.3134       1       0
## 104  68.17837 26.48481 79.53621 312.4776       1       0
## 105  66.61030 29.25306 79.81711 319.3970       1       0
## 106  62.57706 26.12289 71.57684 314.7064       0       1
## 107  67.60613 30.75519 81.30891 317.5702       0       0
## 108  69.09281 30.06175 74.63872 310.5069       1       1
## 109  65.11664 29.41540 75.88772 308.3255       1       1
## 110  67.17145 31.58770 83.43286 328.9675       0       0
## 111  66.60601 23.89179 66.26824 301.9267       0       1
## 112  64.01957 30.24038 75.18592 310.5467       0       1
## 113  67.92207 31.00058 80.68815 313.9801       0       0
## 114  66.65148 27.29296 70.77785 315.0836       1       1
## 115  68.23039 35.08266 83.10575 326.7581       1       0
## 116  67.89857 29.25180 77.92494 319.8639       0       1
## 117  65.30327 23.13583 70.92427 305.0988       1       1
## 118  66.84990 29.18437 83.81950 329.3608       0       0
## 119  67.77160 31.78662 88.59698 327.6444       1       0
## 120  67.46299 27.91019 75.92598 316.2892       0       1
## 121  67.38859 29.41983 81.47369 319.7076       1       0
## 122  70.05716 33.11906 80.46217 330.8265       0       0
## 123  64.84143 32.45471 80.91034 325.9830       0       0
## 124  69.51257 31.44890 84.45854 324.8460       1       0
## 125  68.36818 28.84041 78.97744 323.7983       1       0
## 126  65.53406 25.15950 74.36942 312.8030       1       1
## 127  64.61987 27.31744 77.39181 307.5454       1       1
## 128  67.83552 29.76203 83.22630 323.0854       1       0
## 129  67.37508 29.80725 83.38596 328.0245       0       0
## 130  69.59468 33.19809 86.56690 333.3891       0       0
## 131  66.39155 25.97894 79.08611 321.0530       0       0
## 132  62.02471 24.06930 79.70086 308.8554       0       0
## 133  68.08944 32.13976 82.40811 322.3487       1       0
## 134  68.22169 35.22536 81.81319 328.6708       1       0
## 135  65.62674 30.39018 76.24873 311.2100       0       1
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## 136  64.91368 30.81406 77.64771 322.1421       0       1
## 137  61.91278 25.39516 73.79262 305.2317       1       1
## 138  67.02972 26.67269 72.61426 307.2573       0       1
## 139  67.21739 26.69165 79.39838 303.7899       0       0
## 140  66.15279 35.48847 85.39094 330.3696       0       0
## 141  65.56512 28.43027 78.58694 311.5539       1       1
## 142  68.30736 28.65868 79.81972 317.5360       0       0
## 143  68.64318 31.51683 77.94304 314.0199       1       1
## 144  64.28795 25.34035 72.02058 312.6749       1       1
## 145  67.10125 33.22971 76.73858 320.9075       1       1
## 146  67.12378 26.16528 75.12151 305.5929       1       1
## 147  67.81115 30.99358 83.10287 322.6212       1       0
## 148  67.51241 33.05030 80.39239 325.4123       1       0
## 149  69.25706 28.64494 83.68023 319.2037       0       0
## 150  65.62958 30.07060 82.01848 318.7257       0       0
## 151  69.47041 28.78313 86.02419 338.1850       0       0
## 152  69.21857 33.54350 87.00811 327.4177       0       0
## 153  67.71323 31.51713 80.57658 317.2530       0       0
## 154  66.24814 34.11230 84.86178 335.1705       0       0
## 155  70.69157 34.91371 87.16545 332.9593       1       0
## 156  63.05419 28.62385 81.27011 329.8026       0       0
## 157  66.62202 26.22313 72.00862 307.5826       0       1
## 158  69.25812 27.87280 76.55558 319.0517       0       1
## 159  68.36532 31.15466 81.94422 329.3056       0       0
## 160  66.59937 26.11533 81.23192 313.8587       1       0
## 161  68.37295 25.80968 83.30976 322.6088       1       0
## 162  65.77094 26.28350 81.24770 312.0634       1       0
## 163  62.04403 27.24110 72.47236 309.0243       0       1
## 164  68.49556 25.92558 78.13474 302.2925       1       0
## 165  66.37045 29.32699 82.40976 322.5935       0       0
## 166  67.96726 30.71837 84.49228 323.8901       0       0
## 167  67.41919 31.57995 78.14180 313.0283       0       1
## 168  69.38038 29.82607 81.26154 328.6971       1       0
## 169  65.86153 29.92000 75.37047 312.4848       1       1
## 170  67.03964 28.97535 80.08234 312.6339       1       0
## 171  69.14671 35.87337 91.40937 334.2999       1       0
## 172  67.92428 29.69158 78.42488 309.5065       1       1
## 173  65.84587 34.70180 74.68597 313.6334       1       1
## 174  67.25089 34.24447 87.98498 343.3145       0       0
## 175  69.46591 28.55486 85.90753 327.7367       1       0
## 176  66.68662 32.24912 82.96602 329.3284       1       0
## 177  68.81760 34.42771 89.31821 331.2681       1       0
## 178  66.79974 29.77162 81.29975 329.3642       1       0
## 179  69.48044 31.09265 84.09143 326.5106       0       0
## 180  67.47815 26.66679 82.59328 322.4713       1       0
## 181  67.94913 30.12104 84.67290 329.1312       0       0
## 182  66.00580 29.32445 79.54357 321.5469       1       0
## 183  67.23234 28.52936 83.10100 313.0590       1       0
## 184  70.43145 34.96217 82.41294 330.4356       0       0
## 185  67.21910 28.91238 76.89480 314.7519       0       1
## 186  59.96767 26.05444 76.62700 307.6717       1       1
## 187  69.20748 33.26537 86.86112 326.4305       1       0
## 188  68.44633 31.02691 86.71521 335.7262       1       0
## 189  64.16406 24.35614 73.97161 292.8174       0       1
```

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## 190  66.68127 29.08365 79.78584 322.3631       1       0
## 191  70.15052 28.94522 81.82867 314.1107       0       0
## 192  69.57470 28.91633 84.08723 320.9325       0       0
## 193  67.11913 31.57779 81.97273 323.7980       1       0
## 194  67.69205 30.87694 82.82725 324.3631       1       0
## 195  63.92543 24.95757 76.44147 306.1327       1       1
## 196  65.58654 30.76369 82.60223 324.6159       0       0
## 197  67.68451 30.05700 80.08430 316.1609       1       0
## 198  65.81256 28.57473 69.16992 316.6300       0       1
## 199  69.48854 30.53211 81.92474 324.9523       0       0
## 200  64.16248 32.20680 82.43050 316.4675       0       0
## 201  63.63296 27.81683 78.87014 314.0979       0       0
## 202  64.52159 28.66565 75.79261 313.6228       0       1
## 203  65.85264 29.06234 75.53387 306.0913       1       1
## 204  69.81428 30.20413 84.32348 324.7332       1       0
## 205  66.51298 26.23946 80.32766 315.1045       1       0
## 206  70.36190 34.41196 86.06959 326.8229       1       0
## 207  69.87324 34.77222 90.90523 335.7505       0       0
## 208  68.67376 34.52952 84.79910 325.4843       1       0
## 209  67.78824 28.54830 79.41093 315.9091       0       0
## 210  64.61764 24.54092 76.55710 304.7137       0       1
## 211  68.34554 31.52578 81.56258 317.4634       0       0
## 212  64.66811 24.17675 75.00359 305.9621       1       1
## 213  65.40935 31.32612 76.94640 311.5948       0       1
## 214  65.87153 31.47754 77.66071 314.6511       0       1
## 215  68.11480 31.98208 78.20041 321.8976       0       1
## 216  62.14611 25.94888 75.11579 306.9372       0       1
## 217  63.56909 27.78738 71.61672 311.0826       1       1
## 218  66.46859 28.60287 76.94174 309.4370       1       1
## 219  70.02134 30.86475 85.42846 318.9730       1       0
## 220  69.96405 32.39088 82.81069 312.6235       1       0
## 221  67.21750 28.42560 73.20832 303.2513       1       1
## 222  66.89337 27.52692 74.14464 303.4620       1       1
## 223  72.36752 28.98847 88.14961 334.0972       1       0
## 224  63.72703 29.95233 72.89522 313.9601       1       1
## 225  64.69757 22.81566 72.49325 303.9129       0       1
## 226  62.92651 29.94540 76.51916 318.6592       0       1
## 227  69.26696 31.00647 87.43299 332.0495       1       0
## 228  66.96755 32.66179 82.42803 318.0844       1       0
## 229  67.03496 35.66086 85.81660 330.8502       1       0
## 230  66.75875 27.36695 75.38212 318.9654       1       1
## 231  68.11771 34.34765 89.32524 333.5725       0       0
## 232  65.77375 25.55817 70.55318 302.3624       1       1
## 233  68.33719 29.26164 75.43718 315.9451       0       1
## 234  66.53799 32.02035 84.05502 317.5753       0       0
## 235  70.20514 37.63131 87.54021 341.3387       1       0
## 236  64.71754 27.38752 74.95651 309.0086       0       1
## 237  70.33361 35.09692 88.34522 339.1141       1       0
## 238  70.10295 32.34114 81.30662 330.4252       0       0
## 239  69.33196 33.33136 81.07477 326.9082       1       0
## 240  69.18856 32.20253 88.02670 337.7943       1       0
## 241  66.22316 33.61469 83.52980 336.1165       1       0
## 242  71.44132 35.55404 89.80768 326.9213       1       0
## 243  65.87617 28.16675 73.20099 306.9783       1       1
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## 244  61.24389 24.88316 69.83938 299.5154       1       1
## 245  67.63420 30.10109 76.30376 319.9004       0       1
## 246  69.44017 35.36174 91.78569 335.5812       1       0
## 247  69.29184 29.69316 80.97909 318.7495       1       0
## 248  69.16818 28.39615 86.18793 334.5841       0       0
## 249  63.34875 26.79684 74.49932 305.7535       0       1
## 250  64.37638 30.97495 76.94632 318.0234       0       1
## 251  65.18015 29.24885 79.85831 314.6333       0       0
## 252  65.47964 28.45365 79.47558 317.1830       1       0
## 253  69.20418 33.41121 82.30645 327.7961       0       0
## 254  66.83783 27.04299 78.34264 316.7386       1       0
## 255  69.93746 27.55450 78.55709 313.6298       1       0
## 256  65.78913 30.38146 84.39397 312.5921       1       0
## 257  67.57447 29.40031 75.65097 310.8403       0       1
## 258  68.55637 33.43492 82.65721 326.7407       1       0
## 259  69.32528 32.31440 84.40082 327.9560       1       0
## 260  66.59566 34.78000 82.18126 330.3012       1       0
## 261  66.21769 25.82795 80.86743 315.6262       1       0
## 262  66.35012 24.17443 68.88378 301.0594       1       1
## 263  66.05706 32.42176 77.07100 321.3284       1       1
## 264  66.47506 29.72952 77.59840 314.3656       0       1
## 265  67.33777 31.88912 81.05565 319.4538       1       0
## 266  67.04448 31.27948 79.00921 318.7728       1       1
## 267  66.03902 30.80050 82.83121 322.0556       0       0
## 268  65.45513 30.38172 75.67609 309.1317       1       1
## 269  67.18777 29.54729 82.35928 317.8980       1       0
## 270  65.80178 30.38117 81.70535 325.7305       1       0
## 271  68.27416 24.56204 73.54500 304.9362       0       1
## 272  68.42551 30.55396 78.57507 324.5166       0       0
## 273  66.15640 28.57112 73.39069 314.9744       1       1
## 274  66.39587 32.31965 78.87074 324.3141       1       1
## 275  64.87709 30.48429 70.81256 311.6926       1       1
## 276  67.26099 32.01866 79.37786 325.4258       0       0
## 277  64.73517 25.41463 75.96188 308.0413       0       1
## 278  66.25347 26.70880 75.70889 309.0648       1       1
## 279  69.73276 32.25633 86.99096 337.3409       1       0
## 280  68.86974 31.93738 88.35422 331.1814       1       0
## 281  69.54136 36.14211 83.08639 325.5809       1       0
## 282  68.71512 27.86736 81.93676 313.2998       1       0
## 283  66.72472 29.65247 72.75660 307.8663       1       1
## 284  66.33809 34.09899 80.60371 327.6799       1       1
## 285  65.14147 30.10495 73.45445 313.6082       1       1
## 286  65.60741 27.56335 76.05277 303.8929       0       1
## 287  68.69087 36.04749 91.70801 337.7105       1       0
## 288  67.26347 30.46301 80.54016 314.5438       0       0
## 289  63.86947 28.57557 79.77549 310.2414       1       0
## 290  63.90835 28.19139 80.25117 319.5659       1       0
## 291  64.89090 33.13719 83.17860 337.5012       1       0
## 292  67.32832 27.92758 79.07818 311.4507       1       0
## 293  66.59277 27.84271 77.71988 316.3277       0       0
## 294  68.89483 27.77137 82.80051 318.7881       0       0
## 295  66.54633 28.39210 76.70950 313.3400       0       1
## 296  68.43727 32.18418 77.17993 314.9485       0       1
## 297  63.14803 30.67796 74.40971 312.8631       1       1
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## 298  64.21388 30.89477 77.78320 316.8402       0       1
## 299  66.90076 25.20107 76.50101 313.8276       0       0
## 300  69.68358 32.33574 85.75955 330.5521       1       0
## 301  66.56717 31.61180 81.68179 328.0951       1       0
## 302  66.69736 28.76064 79.73227 323.7238       1       0
## 303  70.20772 31.86700 80.52358 318.9667       1       0
## 304  66.59649 26.20225 77.10736 307.6047       1       1
## 305  68.60890 28.65767 78.54228 322.3815       0       0
## 306  66.63619 33.38771 82.63848 331.1159       0       0
## 307  68.50666 24.90387 80.15507 308.0130       1       0
## 308  69.86913 27.64241 78.92755 318.5253       0       0
## 309  70.33164 32.22242 80.82491 325.0642       0       0
## 310  67.34448 30.11611 83.59366 321.8268       1       0
## 311  65.98234 24.06436 77.04853 303.6944       1       0
## 312  66.18903 27.57273 72.89732 313.1895       1       1
## 313  64.65003 30.77470 77.90060 323.1395       0       1
## 314  67.60519 29.39832 79.89510 317.0551       1       0
## 315  66.39510 29.89350 77.89079 317.4607       1       1
## 316  65.61056 27.18065 81.41163 321.7505       1       0
## 317  67.67553 30.81525 84.48241 325.3265       1       0
## 318  67.06758 26.13713 72.86331 305.6645       1       1
## 319  71.22249 31.58896 87.56294 338.8352       0       0
## 320  66.16423 32.36825 79.89297 324.5528       0       0
## 321  66.03544 28.14400 80.60787 317.5044       0       0
## 322  68.78934 24.10326 84.30692 316.9320       0       0
## 323  63.41466 30.02464 75.44446 316.8967       1       1
## 324  70.19454 32.63180 88.30519 341.2175       1       0
## 325  66.65130 34.66168 85.99064 343.1839       1       0
## 326  67.09323 33.00088 79.42362 326.9569       0       1
## 327  67.22537 35.03117 86.20814 341.8833       1       0
## 328  67.60126 24.81984 79.09257 317.1210       1       0
## 329  67.73570 34.41434 81.95491 334.8819       1       0
## 330  65.02061 30.06879 81.41949 315.7075       1       0
## 331  65.30367 31.90796 83.14736 336.0567       1       0
## 332  69.81314 29.96307 82.92926 331.7859       0       0
## 333  68.59569 31.39326 84.17505 333.9476       1       0
## 334  65.93037 30.37209 76.95148 313.5624       1       1
## 335  68.61196 31.44220 85.71114 342.8948       0       0
## 336  65.19390 28.09604 75.81654 315.1720       0       1
## 337  66.37841 25.56566 71.41936 306.4926       1       1
## 338  69.17332 30.19818 78.00321 316.5055       1       1
## 339  68.08721 30.84690 86.24473 329.4784       1       0
## 340  67.41498 31.91469 78.73630 325.0520       1       1
## 341  67.23873 31.97357 83.70480 326.3553       1       0
## 342  65.52204 29.34380 80.38498 317.1139       1       0
## 343  67.07384 33.40196 80.58835 328.4872       0       0
## 344  67.02166 30.25380 86.12808 327.0694       1       0
## 345  68.33696 29.84591 78.53605 316.4760       1       1
## 346  67.00812 28.82592 78.50433 311.7098       1       1
## 347  66.73366 30.83851 81.25478 320.7648       1       0
## 348  64.62621 26.39700 73.91163 310.0667       1       1
## 349  70.60587 31.83543 86.18211 333.5424       1       0
## 350  65.80326 27.93804 81.34100 325.4695       0       0
## 351  67.18841 28.00680 75.43885 309.7486       1       1
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## 352  65.39784 29.75648 67.61603 299.7683       1       1
## 353  70.14979 32.36794 86.08325 318.6162       0       0
## 354  70.18489 35.72981 89.77070 338.2626       0       0
## 355  66.69386 32.04014 79.66673 319.8774       1       1
## 356  65.60516 33.46849 76.25797 314.2655       0       1
## 357  68.05473 32.72153 83.54175 318.7491       1       0
## 358  66.02484 28.39090 72.24404 309.3664       0       1
## 359  66.66172 36.04387 90.92708 339.9793       0       0
## 360  70.30801 35.06289 92.84949 343.0877       0       0
## 361  68.01065 29.36634 83.69476 326.2572       0       0
## 362  70.74807 32.90407 81.03431 323.6219       1       0
## 363  66.64264 33.80603 79.95776 328.3207       1       1
## 364  66.64974 27.84740 81.05535 320.9643       1       0
## 365  64.32912 29.84454 79.80138 327.4286       0       0
## 366  67.31944 30.38532 76.33213 313.2223       0       1
## 367  68.09546 31.86346 79.95121 305.6046       1       1
## 368  66.90684 28.59713 73.23988 310.6642       1       1
## 369  68.00690 30.99541 87.84085 323.3707       0       0
## 370  68.55132 30.86509 87.07588 317.3114       1       0
## 371  66.76707 30.63895 79.37209 313.8865       1       1
## 372  69.98782 30.77713 85.35063 330.0667       1       0
## 373  67.99414 33.48043 86.59291 338.0283       1       0
## 374  63.33750 29.94257 74.40548 310.8733       1       1
## 375  66.45589 31.13488 84.74757 325.6815       0       0
## 376  67.67672 29.44117 78.17537 313.4948       0       1
## 377  67.17165 30.70929 78.99127 311.7368       1       1
## 378  68.26051 31.39216 83.85667 333.5674       1       0
## 379  66.18074 30.77360 90.21873 333.1593       0       0
## 380  66.55708 31.20783 82.72887 324.2880       0       0
## 381  68.67771 30.98549 81.70428 321.4838       0       0
## 382  64.36963 23.69405 67.54088 295.3415       1       1
## 383  67.20959 25.74033 78.95252 309.4278       1       0
## 384  66.93900 24.16038 75.42909 299.2438       1       1
## 385  65.85096 33.53466 79.53881 324.6738       0       1
## 386  67.46852 28.95151 85.43288 320.6243       1       0
## 387  67.17937 28.72453 80.94009 311.8576       1       0
## 388  64.82868 30.12382 77.18640 321.2542       0       1
## 389  68.51982 32.78912 80.17339 319.8362       0       1
## 390  63.04335 30.06483 72.03512 319.0334       1       1
## 391  66.82395 29.86936 72.12927 304.2126       1       1
## 392  68.01199 31.45958 80.60533 329.4544       0       0
## 393  64.52951 28.23175 70.20702 297.9283       0       1
## 394  63.24154 27.37068 73.39942 318.1387       0       1
## 395  67.77349 31.86725 78.79922 319.0299       1       1
## 396  66.20354 31.35989 79.14014 320.9368       1       1
## 397  67.61454 31.39447 78.75081 321.9133       0       1
## 398  65.96747 31.57838 82.95482 330.7410       0       0
## 399  70.47363 29.59523 88.79058 323.0519       1       0
## 400  67.75617 32.87631 74.77816 325.7666       0       1
## 401  68.67994 31.67844 82.38653 335.1177       1       0
## 402  69.76859 30.73500 88.31656 331.2000       1       0
## 403  65.18739 27.54595 77.09664 312.9623       1       1
## 404  68.27368 33.27150 85.34825 330.6865       1       0
## 405  68.17291 31.95704 77.27461 315.2361       1       1
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## 406  67.04192 32.13386 80.75261 319.0014       1       0
## 407  65.17166 28.16487 76.60565 323.9365       0       0
## 408  71.81044 32.66357 85.49891 331.0904       0       0
## 409  63.27911 31.85133 74.56470 315.0747       1       1
## 410  66.15717 30.07254 73.68712 306.5665       0       1
## 411  66.36749 25.41066 81.76369 321.5743       0       0
## 412  64.51651 31.06664 78.61626 329.1736       1       0
## 413  64.02755 28.49295 78.29043 315.8325       0       0
## 414  69.04823 35.34698 86.25655 331.3557       1       0
## 415  66.43094 30.57887 80.66332 315.1728       1       0
## 416  69.57444 31.45673 78.40468 320.2487       0       1
## 417  69.54159 33.96675 92.08344 338.6624       1       0
## 418  68.58534 31.01844 79.00948 318.0221       1       1
## 419  68.93811 32.43801 85.09936 324.5845       1       0
## 420  65.40723 31.45018 78.34073 314.0796       1       1
## 421  72.35081 30.93099 87.89268 330.7119       0       0
## 422  65.71045 30.60687 79.18847 313.5209       1       1
## 423  67.86945 29.80504 81.71528 316.8107       1       0
## 424  67.73256 35.23092 82.59157 334.1585       0       0
## 425  63.31733 25.66011 77.09561 311.3732       0       0
## 426  65.40022 33.08892 85.70409 325.5428       1       0
## 427  69.72317 28.82959 83.59687 321.6953       1       0
## 428  65.17766 28.69141 72.04055 314.3538       0       1
## 429  69.04296 28.71009 81.44387 320.4777       0       0
## 430  70.45451 30.24670 85.46253 332.3272       1       0
## 431  67.02541 32.79794 78.48167 316.4523       1       1
## 432  63.91978 35.28542 79.92761 316.0065       1       1
## 433  69.11231 28.76917 82.21250 318.2142       0       0
## 434  64.06657 32.98088 77.81585 316.3908       1       1
## 435  67.55044 29.66332 77.36580 316.5438       1       1
## 436  66.64262 31.97344 88.63403 317.4826       1       0
## 437  63.16272 27.05703 78.17617 318.8912       0       0
## 438  64.69399 25.20462 72.53711 299.0531       1       1
## 439  71.43708 33.14041 86.04716 334.7465       1       0
## 440  63.34423 21.05469 72.02967 308.5853       1       1
## 441  65.80880 31.12243 81.38567 323.8749       1       0
## 442  65.78167 32.94511 85.57545 339.8950       0       0
## 443  67.70169 34.65683 79.21145 326.3683       1       1
## 444  68.10045 27.61310 77.65896 312.2168       0       1
## 445  71.64243 27.23450 81.67771 313.6625       1       0
## 446  64.68154 27.59634 77.64979 320.0954       1       0
## 447  73.06659 34.29582 90.21251 344.5585       1       0
## 448  69.27963 34.14938 89.69034 331.8782       0       0
## 449  64.58560 28.92529 78.51738 314.7547       0       1
## 450  64.33633 30.93769 74.50527 305.4675       0       1
## 451  65.71134 29.94760 77.11206 310.8899       1       1
## 452  65.19870 25.96356 70.36143 311.3447       0       1
## 453  64.13786 23.70587 76.54515 307.4906       1       0
## 454  69.27405 33.16517 79.33714 324.4193       1       1
## 455  67.79295 28.76791 76.45432 306.1678       1       1
## 456  66.40383 28.21640 74.53925 309.3605       0       1
## 457  64.68945 28.29372 79.77829 315.4521       1       0
## 458  68.09743 32.12863 80.62750 330.5578       1       0
## 459  68.90422 33.28804 88.66468 329.5719       1       0
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## 460  67.45801 33.72313 78.60911 317.6773       1       1
## 461  64.27536 31.70743 72.89739 318.8478       0       1
## 462  66.15633 31.34046 74.10865 317.9745       1       1
## 463  67.08127 29.13011 80.46201 314.1862       1       0
## 464  66.45737 31.52527 76.45145 321.1666       0       1
## 465  66.32371 31.63588 78.12507 322.6370       1       1
## 466  68.37935 30.57032 84.24394 327.5692       0       0
## 467  70.14567 31.02643 82.44964 328.7678       1       0
## 468  66.34852 34.64191 87.91471 335.7075       1       0
## 469  68.68721 34.72562 79.57458 324.9504       1       1
## 470  66.05369 33.76536 87.89543 339.7104       1       0
## 471  65.76418 29.29377 78.23563 321.0426       0       0
## 472  65.30931 28.95469 80.73126 320.8013       1       0
## 473  64.36344 25.31870 66.59474 302.0812       1       1
## 474  73.00234 32.02032 84.41024 321.6210       1       0
## 475  65.11294 31.37692 80.76179 313.2203       1       1
## 476  65.72670 30.73768 69.69516 307.3250       0       1
## 477  65.84404 31.68400 78.90412 326.1252       1       1
## 478  68.29411 27.42034 81.44444 316.1677       1       0
## 479  67.56819 29.35770 79.97502 318.9886       1       0
## 480  70.25193 30.24579 78.07656 320.3009       1       1
## 481  66.03997 27.73617 80.77337 316.1420       1       0
## 482  66.77350 31.15782 80.67089 318.5669       1       0
## 483  65.17744 27.55451 77.90262 322.1885       1       0
## 484  65.90094 33.90154 82.54030 323.8348       1       0
## 485  68.33251 31.77630 79.91008 321.2436       1       0
## 486  67.15220 36.46692 82.31635 333.4989       1       0
## 487  67.12446 26.01983 77.84392 310.4373       0       0
## 488  65.14868 29.48330 76.85587 309.2733       1       1
## 489  68.14757 32.71411 83.56715 334.8804       0       0
## 490  66.29832 33.39209 77.38876 323.3932       1       1
## 491  65.64794 29.83823 76.85272 310.8537       0       1
## 492  67.08270 34.82582 88.77710 344.5817       1       0
## 493  66.15155 27.99967 78.98411 317.2193       1       0
## 494  66.23228 25.88694 74.44674 305.7194       0       1
## 495  61.92036 24.81440 72.87221 303.8374       0       1
## 496  67.87966 27.79132 81.28482 313.6154       1       0
## 497  65.96428 34.41870 76.35350 315.7127       1       1
## 498  64.89507 24.36000 75.66956 316.2844       0       0
## 499  66.78631 27.05602 78.70308 319.0117       1       0
## 500  66.18798 33.08604 77.22263 315.1409       0       1
## 501  67.57529 34.85665 82.64144 328.9205       0       0
## 502  66.92037 35.47652 80.75057 336.8243       1       0
## 503  66.29021 31.10481 83.66670 324.8681       1       0
## 504  66.41734 27.88531 76.01800 320.2144       1       1
## 505  65.94153 27.88117 81.58091 318.8293       1       0
## 506  66.99594 26.91370 77.05053 314.4095       1       0
## 507  65.84278 30.17313 82.54810 326.4426       0       0
## 508  65.56291 33.10726 72.29377 313.7115       0       1
## 509  66.28543 30.51812 78.17204 315.3625       0       1
## 510  69.70851 32.96466 88.88100 334.9753       0       0
## 511  65.00208 27.61380 74.75918 309.1101       0       1
## 512  64.83694 25.72701 71.78854 310.9662       1       1
## 513  70.81500 32.83538 88.66162 335.1084       1       0
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## 514  64.48597 27.14910 76.29295 312.4120       0       1
## 515  65.62208 35.16025 80.22418 331.2444       1       1
## 516  67.24084 30.89478 88.68422 329.8383       1       0
## 517  64.87505 31.74976 82.79806 331.6681       1       0
## 518  63.31221 33.90463 84.64335 338.7039       0       0
## 519  68.70820 29.44133 79.26485 321.0970       1       0
## 520  68.96713 30.95873 87.63211 329.7992       1       0
## 521  66.93556 26.95495 80.36790 314.7098       1       0
## 522  67.95653 28.06935 84.54339 329.0165       1       0
## 523  63.25330 24.85188 70.36080 305.3979       1       1
## 524  67.47226 28.92244 75.97708 306.9566       0       1
## 525  67.83231 27.67987 74.94105 313.0615       1       1
## 526  70.31488 29.21053 79.24288 320.9710       1       0
## 527  66.46939 33.21541 86.34924 331.0384       0       0
## 528  69.69752 27.50808 77.38965 307.8251       1       1
## 529  67.36058 26.70075 79.57726 312.9003       0       0
## 530  67.74028 28.58184 77.51349 313.9379       1       1
## 531  70.56984 27.75096 80.54663 318.7024       0       0
## 532  65.01915 34.30584 81.92389 327.2744       1       0
## 533  68.66056 27.71471 84.45212 323.3501       1       0
## 534  66.18507 30.32628 78.92830 312.2699       1       1
## 535  69.27306 31.82120 77.62800 315.0115       1       1
## 536  66.26042 31.05374 77.59687 320.6020       0       1
## 537  65.74095 28.65685 79.74642 315.0265       1       0
## 538  68.67179 33.11181 85.51777 325.5603       1       0
## 539  67.41434 29.02478 84.13143 315.6530       0       0
## 540  68.54313 34.95435 88.55592 332.6980       1       0
## 541  67.69360 25.06903 78.12494 315.0958       0       0
## 542  66.16143 23.96593 71.36609 303.4715       1       1
## 543  69.13089 33.91506 79.58915 316.1558       1       1
## 544  69.14950 31.49323 85.27372 334.8997       0       0
## 545  67.47911 29.15528 80.13343 320.9995       1       0
## 546  69.62511 30.27562 79.63590 324.5461       1       0
## 547  66.21945 26.53121 67.21834 301.8137       0       1
## 548  63.67438 30.13226 82.87483 323.8351       1       0
## 549  66.72771 26.57094 71.69218 311.6066       1       1
## 550  66.99222 29.95601 77.74351 315.5576       1       1
## 551  65.73091 30.51279 78.39832 326.3076       1       0
## 552  66.10404 30.53571 78.28566 321.1906       0       1
## 553  68.71020 25.63237 71.89033 304.0359       1       1
## 554  67.89607 25.87728 83.64371 314.5057       1       0
## 555  68.36101 30.87595 79.79240 329.5407       1       0
## 556  64.91825 26.62520 72.64467 296.9990       1       1
## 557  69.93723 31.12326 82.66151 340.4451       0       0
## 558  66.74795 31.22568 83.79953 326.4981       1       0
## 559  67.01570 29.58281 80.87816 321.4014       0       0
## 560  67.25093 25.01314 77.38914 310.4484       1       0
## 561  68.93108 31.48422 78.85654 324.7668       1       1
## 562  64.62817 28.06892 79.83646 321.9095       1       0
## 563  70.58654 32.62518 86.81290 330.3253       1       0
## 564  64.70445 29.03005 75.71849 320.4686       1       1
## 565  72.30670 33.48998 88.38691 328.8720       1       0
## 566  68.57564 33.64264 83.20998 336.2249       1       0
## 567  65.90615 30.68111 71.98235 310.6730       1       1
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## 568  70.48254 35.76810 89.52840 343.3607       1       0
## 569  68.05223 28.77135 75.81819 318.6357       0       1
## 570  67.19147 28.90516 82.28046 326.2825       1       0
## 571  66.35828 28.49868 75.60247 321.8072       1       1
## 572  67.30874 35.50682 79.49235 335.9166       1       1
## 573  69.46382 32.00967 82.82511 310.4586       0       0
## 574  64.26548 26.68608 75.44483 310.6812       1       1
## 575  69.16349 33.72433 84.52511 326.8697       1       0
## 576  65.50012 29.57990 75.51705 325.4758       1       1
## 577  65.55916 31.11764 79.95103 314.3301       0       1
## 578  66.56056 28.38356 75.09156 311.7261       1       1
## 579  66.69768 26.95413 81.27319 318.7359       1       0
## 580  64.69843 30.36415 69.61571 309.4348       1       1
## 581  65.05268 31.25554 82.25704 323.8645       1       0
## 582  67.37941 29.57023 79.04630 315.9224       1       0
## 583  69.32182 34.06136 84.99340 330.5609       1       0
## 584  68.85254 35.26235 86.40718 340.1555       0       0
## 585  68.17475 30.90995 81.50141 318.3204       0       0
## 586  69.13346 35.09895 84.69088 332.7398       0       0
## 587  69.05134 34.57959 78.09102 321.9149       1       1
## 588  67.40979 31.02835 81.52528 326.1380       0       0
## 589  67.52836 35.75360 82.37311 333.7301       1       0
## 590  65.23761 25.61803 76.84726 310.3033       0       0
## 591  65.94494 23.34917 76.23633 309.9466       1       0
## 592  66.91489 27.85929 82.48860 320.5990       1       0
## 593  69.17975 29.62630 86.78804 334.2516       1       0
## 594  65.91594 30.27069 78.38215 319.4164       1       1
## 595  65.31123 32.04232 75.90078 303.8500       1       1
## 596  67.29011 31.85006 85.02182 329.4322       0       0
## 597  66.51372 24.51878 76.74228 319.1215       1       0
## 598  66.02099 27.59773 79.54564 325.4750       1       0
## 599  66.41602 23.66704 80.87404 314.8860       0       0
## 600  64.68316 22.29338 73.27737 305.8942       1       1
## 601  63.78389 23.30101 68.37080 294.6183       0       1
## 602  66.62633 33.48295 84.27238 318.6298       0       0
## 603  63.72932 27.54595 74.69212 317.8229       0       1
## 604  65.55798 26.64918 81.62421 311.0603       1       0
## 605  67.12018 28.14312 79.18542 322.1032       1       0
## 606  63.12759 23.02985 79.17952 314.5931       1       0
## 607  67.33097 24.08962 78.64663 316.9815       1       0
## 608  68.84293 33.00306 76.94920 313.5214       1       1
## 609  67.75672 26.30034 84.15589 316.7367       1       0
## 610  67.18034 29.30819 77.96763 322.8656       1       0
## 611  63.69868 21.90173 64.82362 294.4523       0       1
## 612  69.20714 32.18225 87.33186 326.1966       1       0
## 613  69.41418 26.59061 79.90502 306.3667       1       0
## 614  68.86135 34.80979 86.05832 326.1044       1       0
## 615  64.63470 28.84927 73.31798 307.5596       1       1
## 616  67.24786 28.98015 82.60947 314.8314       0       0
## 617  65.57297 30.68833 84.46126 320.3615       0       0
## 618  65.52625 31.36568 83.95764 330.9317       0       0
## 619  65.65530 32.01423 87.80360 330.7979       0       0
## 620  60.66325 30.72357 70.64942 307.8350       1       1
## 621  65.95136 28.63413 76.53578 325.0445       0       1
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## 622  66.89616 23.85813 79.08871 310.1353       1       0
## 623  65.87537 26.22653 77.02461 307.0335       1       1
## 624  66.37222 28.39844 72.47562 318.6521       1       1
## 625  66.30583 32.63221 76.61007 321.6616       1       1
## 626  67.60788 25.54221 79.85098 316.7645       0       0
## 627  63.69036 28.00008 76.18387 320.7939       1       1
## 628  67.94137 33.92736 87.03802 330.1917       1       0
## 629  63.77286 31.42306 80.82339 327.8095       1       0
## 630  65.00851 28.82760 79.38091 316.9884       1       0
## 631  66.06238 27.65957 70.01662 310.3287       1       1
## 632  67.78530 32.53986 83.77969 322.3821       0       0
## 633  67.99551 30.99638 84.79365 333.9226       1       0
## 634  68.47970 26.60250 71.46685 300.2629       1       1
## 635  66.64947 26.71034 76.16893 310.4238       1       1
## 636  65.17746 26.47149 78.74543 315.8059       1       0
## 637  69.28776 30.44911 85.02166 328.8731       1       0
## 638  69.55583 31.52270 84.81040 323.1702       0       0
## 639  63.44871 30.73596 78.17242 313.3777       1       1
## 640  66.34816 25.27962 76.82066 317.5118       1       0
## 641  72.47681 36.32656 88.12204 337.4389       1       0
## 642  66.36811 33.83002 79.41213 320.7708       0       1
## 643  65.85295 27.58696 76.22112 320.1083       1       1
## 644  68.02407 31.78028 84.03046 319.7762       0       0
## 645  66.35988 30.81851 82.70106 327.5875       0       0
## 646  66.27949 26.80658 71.33570 299.3953       0       1
## 647  67.06211 33.22660 80.61997 323.7821       0       1
## 648  67.67583 37.15786 81.64239 326.6071       1       1
## 649  66.53084 34.49088 79.82720 314.7744       1       1
## 650  68.50943 26.46965 81.02751 323.9113       0       0
## 651  65.67460 33.97364 86.28797 332.2121       1       0
## 652  66.77935 29.58847 76.48634 307.4389       0       1
## 653  67.63083 33.79502 80.91108 327.4367       0       0
## 654  65.44062 30.10196 75.96380 309.9610       1       1
## 655  66.88272 29.42340 81.27110 319.4391       0       0
## 656  68.08592 30.95262 78.46705 319.2870       0       1
## 657  66.78308 26.79273 85.32512 324.3880       0       0
## 658  64.33988 29.42138 75.49557 316.3894       0       1
## 659  65.66880 36.25169 85.25342 332.4239       1       0
## 660  69.02620 32.15709 82.16228 327.0733       0       0
## 661  67.03893 26.66156 77.41334 311.4457       1       0
## 662  69.97973 30.99406 88.63882 333.6149       1       0
## 663  65.19303 29.48787 77.42915 321.6757       1       1
## 664  65.89533 24.68513 73.40689 301.2885       1       1
## 665  66.27064 33.19971 87.09304 343.4064       1       0
## 666  66.09125 28.85829 76.41852 309.0530       1       1
## 667  67.08580 29.19815 79.63773 316.6954       0       0
## 668  65.57036 28.83740 80.30139 310.7391       1       0
## 669  68.36545 29.12236 80.65996 305.1805       0       0
## 670  66.95103 26.93832 78.14976 311.1110       1       0
## 671  66.89761 28.66325 75.42060 323.5190       1       1
## 672  69.10780 30.85910 82.56542 323.1428       0       0
## 673  68.83566 34.17802 85.09139 335.0668       0       0
## 674  71.70051 31.68208 87.35905 335.7406       0       0
## 675  66.81477 33.54676 84.38636 325.1918       1       0
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## 676  66.57367 34.87869 86.75798 334.4665       0       0
## 677  68.29962 30.27297 76.67149 322.2822       1       1
## 678  65.60055 32.96937 76.13910 311.7066       1       1
## 679  68.24625 27.04729 72.55847 302.9193       1       1
## 680  66.09063 29.38330 80.17776 328.5854       0       0
## 681  65.89930 30.32049 82.06033 320.5370       1       0
## 682  67.63766 34.48942 83.88853 339.8663       1       0
## 683  65.86202 36.49678 79.96319 324.3016       0       1
## 684  66.72454 27.31047 76.93979 315.0045       1       1
## 685  66.80895 36.10893 89.25061 340.4776       0       0
## 686  63.90247 21.85492 70.91049 302.1552       1       1
## 687  66.32545 26.54645 78.60511 306.2511       0       0
## 688  66.28239 30.90638 78.75874 317.2656       0       1
## 689  68.50998 31.01630 80.17785 315.4897       1       0
## 690  64.70168 25.49782 76.13626 306.1067       1       1
## 691  66.16532 29.31337 72.84108 311.5142       1       1
## 692  66.64515 29.18316 74.29664 319.6711       0       1
## 693  63.81561 27.08143 73.97095 298.1663       0       1
## 694  67.12131 26.62891 76.21911 305.6214       1       1
## 695  66.84353 32.27211 81.90953 333.3553       0       0
## 696  67.05411 28.17226 83.33951 324.0560       0       0
## 697  67.60487 31.13396 83.01444 320.6473       1       0
## 698  65.70381 28.10135 73.95994 314.8032       1       1
## 699  69.42363 34.04194 82.69357 327.9379       0       0
## 700  66.72620 27.02743 77.53829 312.3656       0       0
## 701  67.72454 31.97724 82.50396 317.1382       1       0
## 702  66.01693 30.52493 74.48961 325.8732       0       1
## 703  62.59377 24.24283 69.40334 297.7255       1       1
## 704  69.32661 29.83811 85.37042 322.9831       1       0
## 705  65.52544 25.43838 76.59415 310.4132       1       0
## 706  68.11422 29.55410 82.26847 325.1260       0       0
## 707  64.71275 33.21584 78.65208 319.0246       0       1
## 708  65.68441 26.04432 69.75977 306.0799       0       1
## 709  67.14741 27.27858 78.03089 316.3720       1       0
## 710  66.78587 28.11044 76.29058 317.4673       0       1
## 711  66.71180 28.16880 84.37832 325.1112       0       0
## 712  66.37217 30.43764 77.05083 313.4387       1       1
## 713  69.98257 40.98673 88.46821 339.8086       0       0
## 714  66.57155 32.77156 78.78880 329.1322       0       1
## 715  66.19760 32.26271 82.07147 317.5063       0       0
## 716  66.99829 30.05670 78.38126 321.2968       0       1
## 717  64.80927 29.21785 77.59849 322.9536       0       0
## 718  71.86797 37.70556 91.87533 352.6204       1       0
## 719  65.89163 25.57649 79.12272 312.4788       1       0
## 720  68.30965 33.79869 86.86408 329.5878       1       0
## 721  66.17479 29.31600 75.79415 315.5465       0       1
## 722  64.87023 31.67618 79.27587 318.3455       0       1
## 723  67.21164 29.26827 81.20893 328.1584       0       0
## 724  73.36860 34.78949 88.22945 338.4475       1       0
## 725  64.04468 25.15957 76.43851 317.9682       1       0
## 726  66.88841 28.21879 76.96767 312.9125       0       1
## 727  68.59513 30.44889 82.37275 321.0406       1       0
## 728  64.06071 30.77457 77.02669 315.7694       1       1
## 729  66.27632 30.73189 82.88722 326.8701       1       0
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## 730  71.03307 32.67486 82.33254 333.0672       1       0
## 731  68.66534 30.00448 81.22254 324.7668       0       0
## 732  67.35794 30.63854 78.32503 326.0201       1       0
## 733  67.89614 28.91406 79.42855 316.1890       0       0
## 734  64.69745 32.96520 82.33632 331.0699       0       0
## 735  67.33905 34.18249 79.30867 328.6338       0       1
## 736  68.02165 29.01063 82.79567 319.4810       0       0
## 737  69.83880 28.95289 79.01791 324.5696       0       0
## 738  71.18897 32.37991 82.31467 326.5213       0       0
## 739  69.13826 34.62401 85.01678 333.6852       1       0
## 740  68.06607 31.24184 83.04024 322.8121       0       0
## 741  67.18889 29.44242 78.72415 309.9128       1       1
## 742  65.75136 34.12669 85.68625 333.9125       1       0
## 743  66.82859 26.92636 81.59329 322.7994       1       0
## 744  64.29842 33.15300 79.33163 326.7474       1       1
## 745  67.98937 28.95612 74.34552 310.5802       1       1
## 746  63.11164 32.03850 76.13097 320.0833       1       1
## 747  72.17429 30.42828 78.68271 316.6405       1       1
## 748  66.84792 31.63287 74.08305 313.0198       1       1
## 749  66.66318 31.72688 79.34786 320.4927       0       1
## 750  67.69189 30.05995 81.45577 325.5669       1       0
## 751  68.98078 30.07811 84.50405 324.8865       0       0
## 752  66.63576 30.14647 76.62270 309.5411       1       1
## 753  69.49289 31.19354 83.95932 325.1499       0       0
## 754  67.10795 30.91405 79.86029 315.4121       1       1
## 755  62.83116 28.96922 74.83455 318.5791       0       1
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## 758  64.21578 31.60282 83.42874 328.2431       1       0
## 759  69.99077 32.65291 81.01829 321.7388       1       0
## 760  68.52854 31.07325 86.20671 331.5254       1       0
## 761  64.47881 33.00745 81.92572 321.5636       1       0
## 762  67.69971 30.21728 82.59802 316.2273       0       0
## 763  66.35394 27.90732 83.39454 315.7317       0       0
## 764  66.57198 29.22396 81.10753 322.3533       0       0
## 765  64.06382 30.98977 71.70365 312.3722       1       1
## 766  68.65007 30.44340 83.62913 328.8137       0       0
## 767  67.91035 32.80783 80.59774 323.7940       0       0
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## 769  63.23092 31.47782 80.22480 325.5923       0       0
## 770  66.53681 32.78490 78.66034 319.4781       1       1
## 771  64.55639 27.20510 72.08952 299.6623       0       1
## 772  70.32471 29.30471 79.86689 323.0501       0       0
## 773  68.18386 22.80611 72.65131 305.4437       0       1
## 774  65.44397 31.35616 83.81654 323.4065       1       0
## 775  65.34133 26.38983 73.94132 309.0469       1       1
## 776  64.95957 30.99548 76.01907 316.6061       0       1
## 777  63.16565 28.96721 73.43973 319.4517       1       1
## 778  69.03022 33.78832 86.04762 330.9215       1       0
## 779  67.87952 30.33929 83.79805 318.5152       1       0
## 780  66.35278 26.89121 83.72794 327.6304       1       0
## 781  67.03226 25.50841 77.72796 317.8842       0       0
## 782  66.68459 29.89763 79.58571 313.4177       1       1
## 783  66.39223 25.95404 79.51043 307.8810       1       0
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## 784  66.81452 28.18541 71.27404 304.9489       1       1
## 785  67.30750 32.48083 78.97127 324.2316       1       1
## 786  68.37688 26.12630 80.17473 311.0928       0       0
## 787  65.23587 25.40174 76.62453 315.2836       0       0
## 788  69.02387 29.51259 82.59468 325.6363       1       0
## 789  71.30583 31.71470 84.73003 327.8907       1       0
## 790  66.04390 31.78082 80.63490 318.3247       1       0
## 791  68.24780 29.79361 78.68097 314.1015       1       1
## 792  67.62285 29.12876 79.12797 324.0458       1       0
## 793  66.14439 31.05119 78.63480 320.6531       0       1
## 794  69.57178 27.03008 83.83990 316.8346       1       0
## 795  70.77317 35.41897 91.03789 343.0321       1       0
## 796  67.35211 31.05237 74.87654 319.4441       0       1
## 797  68.36580 26.98554 78.98310 310.7390       1       0
## 798  66.16952 22.85010 68.55906 293.4007       1       1
## 799  64.61735 33.25308 72.81086 325.7121       0       1
## 800  66.97911 34.88584 83.02669 341.2453       1       0
## 801  65.63214 27.58563 72.21009 315.7892       0       1
## 802  68.66708 32.07777 79.12042 322.3042       1       1
## 803  66.09554 29.44057 79.40970 321.7600       0       0
## 804  64.11751 27.87966 75.73221 317.0161       0       1
## 805  69.09292 29.81646 77.02797 312.8113       0       1
## 806  67.75424 29.24758 73.80257 314.3848       0       1
## 807  67.42134 30.48746 82.91575 323.2305       1       0
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## 822  64.54633 30.55650 76.10888 322.8019       1       1
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## 824  65.54752 32.90547 77.36952 322.0093       1       1
## 825  67.58565 30.00480 84.12650 323.2505       1       0
## 826  66.12011 28.07358 79.89807 325.5973       0       0
## 827  68.01412 29.05101 80.38229 317.9410       1       0
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## 829  68.56434 30.22543 81.15470 324.0329       1       0
## 830  65.96359 33.70388 81.64902 325.6646       1       0
## 831  65.97696 25.07616 76.96873 311.3849       1       0
## 832  68.66817 35.07524 86.27898 327.4734       0       0
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## 834  69.94411 33.29701 84.55826 329.8854       0       0
## 835  66.47581 32.68267 84.28415 328.9229       1       0
## 836  68.58521 36.03427 89.47579 338.2894       1       0
## 837  69.80709 30.17654 80.02965 320.2465       0       0
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## 838  68.04612 31.59506 84.43492 318.6167       1       0
## 839  70.36531 30.01638 83.00004 324.4826       1       0
## 840  67.18597 25.15102 73.12921 311.6377       1       1
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## 842  66.39272 30.90417 77.48615 322.7624       0       1
## 843  65.12622 27.04861 74.14700 307.3756       1       1
## 844  63.35982 25.17789 72.96020 306.8478       1       1
## 845  63.60792 32.24072 79.98341 326.9851       0       0
## 846  66.72191 30.87810 75.23382 309.8705       1       1
## 847  65.88940 29.60829 79.12352 324.1494       1       0
## 848  66.60489 32.55728 85.78494 335.9888       1       0
## 849  67.35365 29.52455 80.02899 323.0035       1       0
## 850  67.69816 32.32785 75.13614 312.8367       1       1
## 851  67.01999 33.59685 80.77688 328.5656       1       0
## 852  66.67477 27.34187 72.02135 313.7395       1       1
## 853  65.47219 28.05619 77.69135 319.7291       1       0
## 854  60.87551 28.42707 67.72269 315.5805       0       1
## 855  66.10057 30.59828 72.68320 312.2372       1       1
## 856  64.80826 29.66617 77.76105 311.6022       0       1
## 857  68.30320 27.87336 83.18253 316.2621       0       0
## 858  68.11937 33.67062 85.64856 324.7061       0       0
## 859  67.18378 32.85285 79.89634 319.0524       0       1
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## 872  67.69055 36.55627 87.01744 343.1802       1       0
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## 874  66.59919 24.58316 76.70272 307.5715       1       0
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## 878  67.12488 27.73211 79.43364 313.0993       1       0
## 879  69.54610 32.38275 86.46766 325.7626       0       0
## 880  63.21985 24.14101 75.16888 297.7345       1       1
## 881  68.00553 31.73134 82.95243 322.8478       1       0
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## 883  66.22750 27.53552 76.91610 314.2466       1       1
## 884  68.58743 28.51864 82.44115 327.4924       0       0
## 885  63.29797 25.49837 71.57828 296.7041       0       1
## 886  66.33199 29.92226 81.85670 317.3735       1       0
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## 889  66.80839 33.98936 85.91810 322.6125       1       0
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## 891  67.43460 29.71465 84.06404 330.5061       0       0
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## 892  68.54422 34.44960 81.46911 321.8778       1       1
## 893  66.50950 32.06025 81.54365 321.5184       1       0
## 894  65.69533 33.55862 80.38453 315.0060       0       1
## 895  68.04067 33.60271 81.89953 317.8426       0       1
## 896  66.70164 28.64055 75.74709 317.9123       0       1
## 897  65.88558 30.89726 79.17768 321.8372       1       0
## 898  67.85227 35.10215 83.62398 324.2046       1       0
## 899  69.30600 34.93779 90.99137 329.2481       1       0
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## 901  67.48889 24.37529 76.13034 308.8971       0       0
## 902  65.66276 27.26146 73.62240 298.6115       1       1
## 903  68.63316 32.99403 80.47182 323.9086       1       0
## 904  65.96349 30.55694 77.96521 310.5784       1       1
## 905  69.44468 28.79084 78.56471 327.2886       1       0
## 906  70.08909 35.90612 91.95846 346.0141       0       0
## 907  66.68303 30.97883 81.72281 325.6456       1       0
## 908  67.04187 24.35701 70.56727 307.6853       1       1
## 909  66.00062 25.71868 69.00092 303.0901       1       1
## 910  67.58079 27.60454 89.20048 335.7403       0       0
## 911  68.66431 35.93304 85.32912 335.5338       1       0
## 912  68.24837 31.63829 80.41434 322.4820       0       0
## 913  63.89698 35.66177 79.28226 327.3833       0       1
## 914  67.03647 27.56346 81.10108 315.7814       1       0
## 915  68.75068 32.87293 85.70574 333.5350       1       0
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## 927  69.19510 27.27934 83.88077 324.4511       1       0
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## 931  67.88943 25.96374 80.68268 308.9449       1       0
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## 934  70.72077 35.48101 86.73404 332.5331       1       0
## 935  67.68958 36.97262 87.50808 341.0929       1       0
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## 937  68.95423 31.09543 79.71775 322.7290       0       0
## 938  69.46790 32.17801 83.85880 328.2857       1       0
## 939  71.16292 29.43197 84.42526 321.1632       0       0
## 940  68.03811 31.20332 83.00728 324.3578       1       0
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## 942  68.38571 30.91176 84.44762 317.1294       1       0
## 943  65.05607 30.22646 80.36962 318.8301       0       0
## 944  65.78295 27.92113 79.83821 318.3426       1       0
## 945  68.49910 30.51000 79.47668 316.5541       1       1
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## 946  65.86076 28.02762 76.75363 314.7571       1       1
## 947  67.51656 32.22652 82.19477 326.5162       0       0
## 948  66.91543 29.23628 76.76555 311.5902       0       1
## 949  65.24163 34.74784 78.28116 333.7096       1       1
## 950  68.68519 30.09107 78.14648 318.3388       0       1
## 951  67.51375 34.37706 79.75656 325.0895       0       1
## 952  66.86781 27.86269 74.74476 321.8858       0       1
## 953  68.94662 35.37432 85.97186 336.1480       0       0
## 954  64.41000 30.43105 69.68325 311.3844       1       1
## 955  67.99083 27.41512 81.75782 316.2874       0       0
## 956  71.32537 39.29087 91.78297 342.2155       1       0
## 957  67.49833 32.06344 83.19886 327.8313       1       0
## 958  67.70160 30.65304 81.81053 327.9996       1       0
## 959  68.73199 27.51546 82.45759 318.2153       1       0
## 960  66.17128 30.38906 83.20305 323.1411       1       0
## 961  66.32580 29.21793 76.45969 305.4422       1       1
## 962  64.95337 26.27016 75.11357 302.9345       0       1
## 963  67.49466 31.18827 81.57284 319.0583       1       0
## 964  66.72864 28.16444 76.92306 317.8577       1       1
## 965  68.90817 34.40462 88.68554 343.4587       0       0
## 966  67.87717 30.02969 84.67197 322.2760       1       0
## 967  66.03183 30.53639 76.43429 314.3247       1       1
## 968  68.46248 28.49568 75.22126 314.8865       1       1
## 969  68.24515 25.43290 78.38927 318.2970       1       0
## 970  67.62325 29.26048 85.40492 326.7815       1       0
## 971  70.26302 32.47611 86.50703 329.6865       0       0
## 972  66.24647 27.27922 70.24313 295.9081       0       1
## 973  69.32946 36.10481 87.72903 336.4811       0       0
## 974  66.15219 23.99399 73.36115 309.9103       1       1
## 975  65.51994 33.71527 81.16006 331.3746       1       0
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## 977  67.18190 30.70295 75.41083 317.5927       1       1
## 978  67.33921 29.56912 82.24545 315.7088       1       0
## 979  72.09305 32.60856 81.74717 335.7594       1       0
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## 981  68.46314 31.56122 78.96548 331.8548       1       0
## 982  62.58466 25.58961 69.48382 301.3372       1       1
## 983  68.26705 30.58729 76.28383 319.3819       0       1
## 984  66.37724 29.67569 69.82238 304.3351       1       1
## 985  67.62078 33.49025 77.09549 327.4095       0       1
## 986  67.18931 30.02040 77.24474 325.9450       1       1
## 987  61.52927 24.16385 68.42235 308.7857       1       1
## 988  70.30169 32.62940 87.48565 326.2831       1       0
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## 990  71.25691 36.22592 85.61161 332.8615       0       0
## 991  64.85723 30.83165 80.07096 325.9969       1       0
## 992  65.13027 28.18641 77.12447 315.4528       0       1
## 993  68.83507 33.56368 84.47053 328.0348       0       0
## 994  68.63909 31.46340 81.87212 328.8736       1       0
## 995  70.05941 32.12438 83.29682 330.7219       1       0
## 996  66.01059 28.19561 80.22639 327.6945       0       0
## 997  65.35072 30.94633 73.40473 318.1134       1       1
## 998  67.09147 28.01789 76.45246 313.0681       1       1
## 999  69.61616 35.31844 84.67352 327.3607       1       0
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## 1000 66.16268 35.22344 88.75819 335.1401       0       0
## 1001 65.76941 25.74710 74.49807 311.1467       1       1
## 1002 65.64414 29.28707 83.05383 315.1524       1       0
## 1003 67.11662 27.31862 78.98486 313.9988       1       0
## 1004 63.77522 31.01877 81.52110 330.9483       1       0
## 1005 66.80406 27.42591 77.02120 307.6899       1       1
## 1006 65.08842 33.86318 79.99986 320.8763       1       1
## 1007 69.60849 31.85560 86.05980 326.3998       0       0
## 1008 68.14118 32.77041 91.39448 335.9392       0       0
## 1009 68.26441 34.34175 84.46014 319.2910       1       0
## 1010 62.42313 25.61833 74.35306 314.8169       0       1
## 1011 66.18579 28.24665 72.13502 301.0639       1       1
## 1012 65.69737 27.92216 76.58842 309.3893       1       1
## 1013 69.01001 31.63498 82.95568 325.9453       0       0
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## 1018 64.67178 24.18223 68.61655 302.1999       1       1
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## 1022 69.27052 34.64471 86.35757 334.4205       0       0
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## 1027 66.90091 34.91737 80.01313 321.7351       0       1
## 1028 67.53696 32.46126 84.56991 328.9936       1       0
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## 1036 68.38517 32.48229 86.84751 332.6600       1       0
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## 1041 65.58853 26.44924 73.05154 304.5882       1       1
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## 1045 72.32311 30.95924 88.84726 330.2697       1       0
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## 1051 68.27456 34.29777 92.24811 339.1659       0       0
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## 1060 66.72077 27.99706 75.01978 319.0117       1       1
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## 1090 65.70335 32.90921 74.97067 313.7833       1       1
## 1091 70.27836 30.81580 85.55811 323.3752       0       0
## 1092 66.94177 28.37477 78.25297 311.9890       1       1
## 1093 65.01178 28.60581 73.81421 315.1222       0       1
## 1094 65.90852 26.89832 73.21317 302.3711       0       1
## 1095 65.82573 25.81304 75.45714 310.1071       0       1
## 1096 70.26509 29.35023 82.00281 320.6989       1       0
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## 1108 70.74257 33.67241 89.97475 337.6833       0       0
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## 1114 65.34129 29.23017 80.62419 316.3098       1       0
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## 1120 64.72091 27.23748 78.96212 324.1897       0       0
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## 1135 69.67683 35.38893 86.17744 336.1541       0       0
## 1136 65.91060 26.05994 68.09823 295.0914       1       1
## 1137 69.26178 26.29980 78.18751 313.9097       1       0
## 1138 66.51695 27.29466 81.14101 305.7157       1       0
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## 1196 68.74172 31.35361 85.66421 325.2916       0       0
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## 1261 66.75705 32.17090 80.71460 321.5856       0       0
## 1262 67.65733 27.73607 78.74695 321.4715       1       0
## 1263 70.34002 24.93101 86.79126 326.2233       1       0
## 1264 69.61493 30.16914 80.67478 324.8365       1       0
## 1265 64.92576 28.14467 75.95076 314.6528       0       1
```

#Analisis univariado para cada una de las variables ##Efecto en la edad

```
univariable_Edad <- glm(Abortos ~ Edad, family = binomial, data = dfa)
summary(univariable_Edad)
```

```
##
## Call:
## glm(formula = Abortos ~ Edad, family = binomial, data = dfa)
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -2.1317  -0.9135  -0.5342   1.0716   2.5869
##
## Coefficients:
##             Estimate Std. Error z value Pr(>|z|)
## (Intercept) 35.61293    2.60417   13.68   <2e-16 ***
## Edad        -0.53929    0.03902  -13.82   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 1693.4  on 1264  degrees of freedom
## Residual deviance: 1435.5  on 1263  degrees of freedom
## AIC: 1439.5
##
## Number of Fisher Scoring iterations: 4
```

#Preliminarmente la edad si esta relacionada en el estudio.

#Efecto en el DAP

```
univariable_DAP <- glm(Abortos ~ DAP, family = binomial, data = dfa)
summary(univariable_DAP)
```

```
##
## Call:
## glm(formula = Abortos ~ DAP, family = binomial, data = dfa)
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -1.5428  -0.9865  -0.7799   1.2399   1.9116
##
## Coefficients:
##             Estimate Std. Error z value Pr(>|z|)
## (Intercept)  4.59978    0.61224   7.513 5.78e-14 ***
## DAP         -0.16824    0.02043  -8.235  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 1693.4  on 1264  degrees of freedom
## Residual deviance: 1620.1  on 1263  degrees of freedom
## AIC: 1624.1
##
## Number of Fisher Scoring iterations: 4
```

#Preliminarmente el DAP si esta relacionada en el estudio.

#Efecto en la clorofila

```r
univariable_ClolA <- glm(Abortos ~ ClolA, family = binomial, data = dfa)
summary(univariable_ClolA)
```

```
##
## Call:
## glm(formula = Abortos ~ ClolA, family = binomial, data = dfa)
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -2.3501  -0.7380  -0.3098   0.7725   2.6881
##
## Coefficients:
##             Estimate Std. Error z value Pr(>|z|)
## (Intercept) 58.16603    3.45785   16.82   <2e-16 ***
## ClolA       -0.18383    0.01087  -16.91   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 1693.4  on 1264  degrees of freedom
## Residual deviance: 1181.9  on 1263  degrees of freedom
## AIC: 1185.9
##
## Number of Fisher Scoring iterations: 5
```

#Preliminarmente la clorofila si esta relacionada en el estudio.

#efecto de la variable hibrido

```r
univariable_h <- glm(Abortos ~ hibrido, family = binomial, data = dfa)
summary(univariable_h)
```

```
##
## Call:
## glm(formula = Abortos ~ hibrido, family = binomial, data = dfa)
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -1.0016  -1.0016  -0.9889   1.3641   1.3784
##
## Coefficients:
##             Estimate Std. Error z value Pr(>|z|)
## (Intercept) -0.46113    0.09075  -5.081 3.75e-07 ***
## hibrido      0.03237    0.11745   0.276    0.783
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 1693.4  on 1264  degrees of freedom
## Residual deviance: 1693.3  on 1263  degrees of freedom
## AIC: 1697.3
##
## Number of Fisher Scoring iterations: 4
```

#Preliminarmente el hibrido NO esta relacionado en el estudio.

#Efecto de la variable rendimiento

```
univariable_RTO <- glm(Abortos ~ RTO, family = binomial, data = dfa)
summary(univariable_RTO)
```

```
##
## Call:
## glm(formula = Abortos ~ RTO, family = binomial, data = dfa)
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -2.4006  -0.2782  -0.0303   0.2120   2.5634
##
## Coefficients:
##             Estimate Std. Error z value Pr(>|z|)
## (Intercept) 76.56397    4.83254   15.84   <2e-16 ***
## RTO         -0.97450    0.06137  -15.88   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 1693.4  on 1264  degrees of freedom
## Residual deviance:  610.7  on 1263  degrees of freedom
## AIC: 614.7
##
## Number of Fisher Scoring iterations: 7
```

#Preliminarmente el rendimiento si esta relacionado en el estudio.

#Analisis multivariado

```
model1 <- glm(Abortos ~ Edad + DAP + hibrido + RTO + ClolA, family =binomial, data = dfa)
```

```
## Warning: glm.fit: algorithm did not converge
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```
summary(model1)
```

```
##
## Call:
## glm(formula = Abortos ~ Edad + DAP + hibrido + RTO + ClolA, family = binomial,
##     data = dfa)
##
## Deviance Residuals:
##        Min          1Q      Median          3Q         Max
## -2.152e-03  -2.000e-08  -2.000e-08   2.000e-08   1.888e-03
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)  54491.60  796877.12   0.068    0.945
## Edad           -25.54     432.80  -0.059    0.953
## DAP            407.75    5963.93   0.068    0.945
## hibrido        -16.97     616.83  -0.028    0.978
## RTO           -488.19    7144.92  -0.068    0.946
```

```
## ClolA          -83.25    1216.92  -0.068    0.945
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 1.6934e+03  on 1264  degrees of freedom
## Residual deviance: 1.8921e-05  on 1259  degrees of freedom
## AIC: 12
##
## Number of Fisher Scoring iterations: 25
```

Comunmente se entiende que el p valor a ser < 0.05 la HO es falsa, realmente el estudio de forma preliminar nos da a entender que es poco probable que sea cierta, asi mismo. Si miramos que p>0.05 tampoco se asegura que HO tampoco sea cierta ya que si puede exitir un efecto real pero este analisis preliminar no alcanza a detectarlo. Sin embargo se puede inferir que existe la posibilidad de que sea cierta la HO, por lo que este modelo no es el mas indicado.

```
model2 <- glm(Abortos ~ DAP + RTO + ClolA, family = binomial, data =dfa) # Debemos eliminar la variable
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```
summary(model2)
```

```
##
## Call:
## glm(formula = Abortos ~ DAP + RTO + ClolA, family = binomial,
##     data = dfa)
##
## Deviance Residuals:
##    Min      1Q  Median      3Q     Max
## -1.631   0.000   0.000   0.000   1.807
##
## Coefficients:
##             Estimate Std. Error z value Pr(>|z|)
## (Intercept) 4642.567   1787.520   2.597  0.00940 **
## DAP           35.995     13.865   2.596  0.00943 **
## RTO          -43.939     17.026  -2.581  0.00986 **
## ClolA         -7.087      2.705  -2.620  0.00879 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 1693.40  on 1264  degrees of freedom
## Residual deviance:   15.32  on 1261  degrees of freedom
## AIC: 23.32
##
## Number of Fisher Scoring iterations: 16
```

#Delta beta

```r
delta.coef <- abs((coef(model2)-coef(model1)[-c(4)])/coef(model1)[-c(4)])
```

```
## Warning in coef(model2) - coef(model1)[-c(4)]: longer object length is not a
## multiple of shorter object length
```

```r
round(delta.coef, 3)
```

```
## (Intercept)        Edad         DAP         RTO       ClolA
##       0.915       2.409       1.108       0.985      56.768
```

```r
model3 <- glm(Abortos ~ Edad+ RTO + ClolA, family = binomial, data = dfa) #Debemos eliminar la variable
summary(model3)
```

```
##
## Call:
## glm(formula = Abortos ~ Edad + RTO + ClolA, family = binomial,
##     data = dfa)
##
## Deviance Residuals:
##      Min        1Q    Median        3Q       Max
## -2.40519  -0.28046  -0.02932   0.21614   2.60867
##
## Coefficients:
##             Estimate Std. Error z value Pr(>|z|)
## (Intercept) 68.65304    6.26308  10.962   <2e-16 ***
## Edad         0.07594    0.06388   1.189    0.234
## RTO         -1.04052    0.07289 -14.276   <2e-16 ***
## ClolA        0.02526    0.01740   1.452    0.146
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 1693.40  on 1264  degrees of freedom
## Residual deviance:  607.18  on 1261  degrees of freedom
## AIC: 615.18
##
## Number of Fisher Scoring iterations: 7
```

#Delta beta

```r
delta.coef <- abs((coef(model3)-coef(model2)[-c(3)])/coef(model2)[-c(3)])
```

```
## Warning in coef(model3) - coef(model2)[-c(3)]: longer object length is not a
## multiple of shorter object length
```

```
## Warning in (coef(model3) - coef(model2)[-c(3)])/coef(model2)[-c(3)]: longer
## object length is not a multiple of shorter object length
```

```r
round(delta.coef, 3)
```

```
## (Intercept)        Edad         RTO       ClolA
##       0.985       0.998       0.853       1.000
```

```r
model_final <- glm(Abortos ~ Edad + DAP + RTO + ClolA, family = binomial,data = dfa) # Elimiando la var
```

```
## Warning: glm.fit: algorithm did not converge
```

```
## Warning: glm.fit: fitted probabilities numerically 0 or 1 occurred
```

```
lrtest(model2, model1)
```

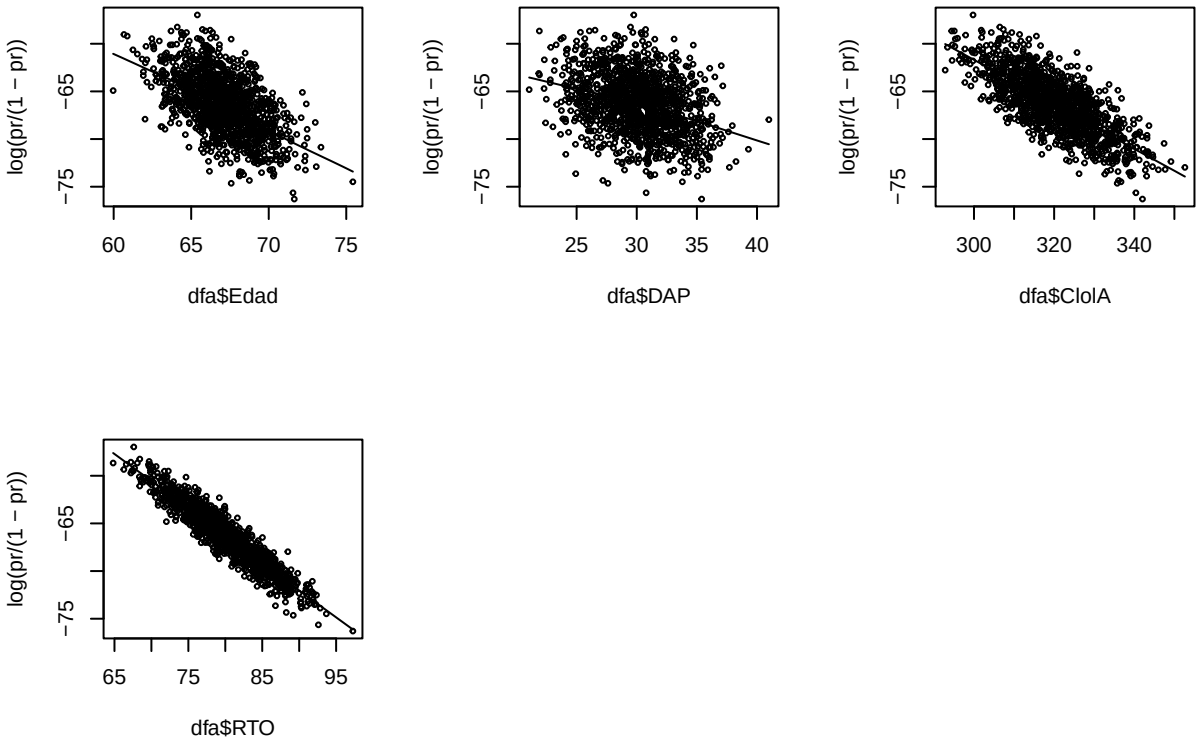
```
## Likelihood ratio test
##
## Model 1: Abortos ~ DAP + RTO + ClolA
## Model 2: Abortos ~ Edad + DAP + hibrido + RTO + ClolA
##   #Df LogLik Df Chisq Pr(>Chisq)
## 1   4  -7.66
## 2   6   0.00  2 15.32  0.0004713 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
anova(model2, model1, test = 'Chisq')
```

```
## Analysis of Deviance Table
##
## Model 1: Abortos ~ DAP + RTO + ClolA
## Model 2: Abortos ~ Edad + DAP + hibrido + RTO + ClolA
##   Resid. Df Resid. Dev Df Deviance  Pr(>Chi)
## 1      1261      15.32
## 2      1259       0.00  2    15.32 0.0004713 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

No es el ideal pero en este caso usaremos el modelo 2.

```
pr <- 1/(1+exp(-w))
par(mfrow = c(2,3))
scatter.smooth(dfa$Edad, log(pr/(1-pr)), cex = 0.5)
scatter.smooth(dfa$DAP, log(pr/(1-pr)), cex = 0.5)
scatter.smooth(dfa$ClolA, log(pr/(1-pr)), cex = 0.5)
scatter.smooth(dfa$RTO, log(pr/(1-pr)), cex = 0.5)
```




```
model_inter2=glm(Abortos ~Edad + DAP + ClolA , family = binomial, data =dfa)
summary(model_inter2)
```

```
##
## Call:
## glm(formula = Abortos ~ Edad + DAP + ClolA, family = binomial,
##     data = dfa)
##
## Deviance Residuals:
##     Min       1Q   Median       3Q      Max
## -2.3696  -0.5665  -0.1829   0.5470   2.4706
##
## Coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept) 109.78898    6.30714  17.407   <2e-16 ***
## Edad         -0.45193    0.05111  -8.842   <2e-16 ***
## DAP           0.49834    0.04493  11.092   <2e-16 ***
## ClolA        -0.29790    0.01873 -15.903   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## (Dispersion parameter for binomial family taken to be 1)
##
##     Null deviance: 1693.40  on 1264  degrees of freedom
## Residual deviance:  959.33  on 1261  degrees of freedom
## AIC: 967.33
##
## Number of Fisher Scoring iterations: 6
```

```
lrtest(model2,model_inter2)
```

```
## Likelihood ratio test
##
## Model 1: Abortos ~ DAP + RTO + ClolA
## Model 2: Abortos ~ Edad + DAP + ClolA
##   #Df  LogLik Df  Chisq Pr(>Chisq)
## 1   4   -7.66
## 2   4 -479.66  0 944.01  < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
anova(model2, model_inter2, test = 'Chisq')
```

```
## Analysis of Deviance Table
##
## Model 1: Abortos ~ DAP + RTO + ClolA
## Model 2: Abortos ~ Edad + DAP + ClolA
##   Resid. Df Resid. Dev Df Deviance Pr(>Chi)
## 1      1261      15.32
## 2      1261     959.33  0  -944.01
```

```
DAP2 <- dfa$DAP
RTO2 <- dfa$RTO
rta= model2$fitted.values
prop_ab <- rta*100
cat_RTO <- cut(DAP2,breaks = 4)
cat_DAP <- cut(RTO2,breaks=4)
data_2 <- data.frame(cat_RTO, cat_DAP, prop_ab)

tips2 <- data_2 %>%
  group_by(cat_DAP, cat_RTO) %>%
  summarise(media_prop_abortos = mean(prop_ab))
```

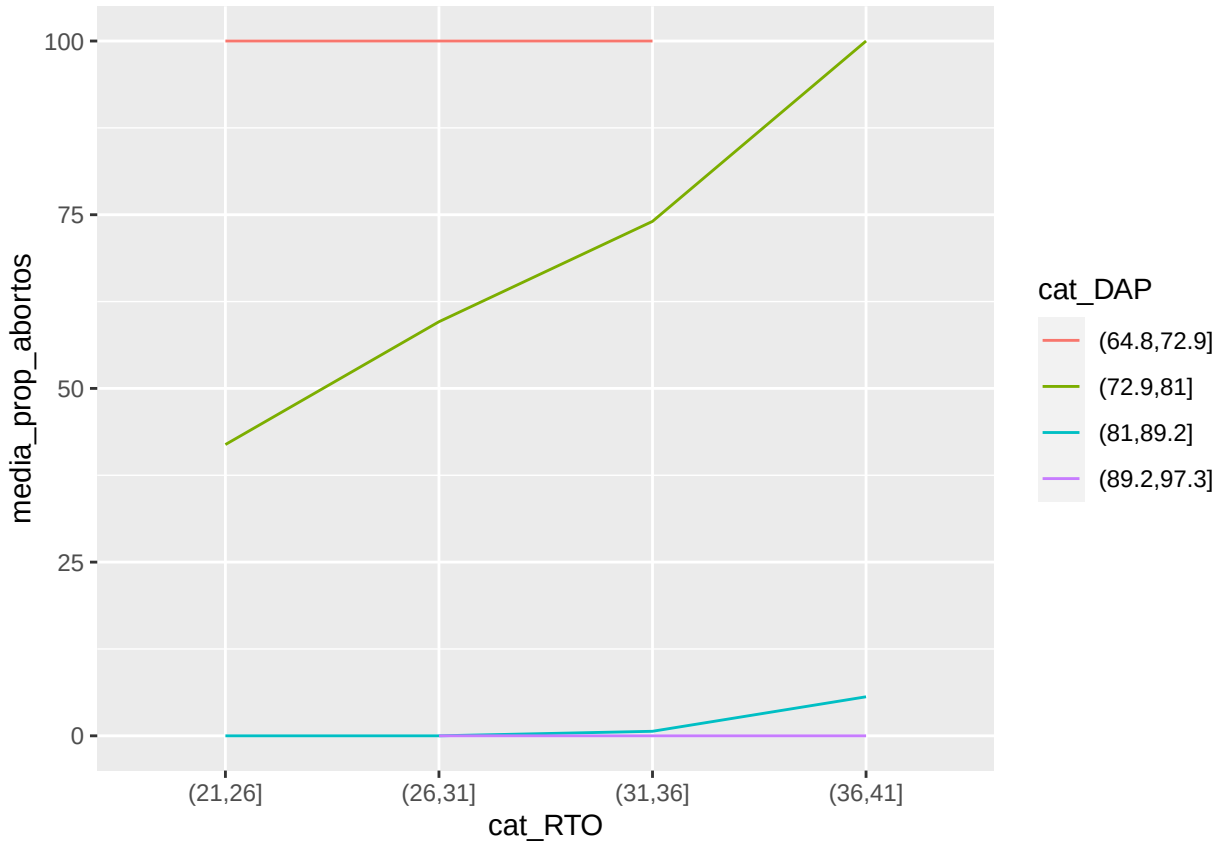
```
## `summarise()` has grouped output by 'cat_DAP'. You can override using the
## `.groups` argument.
```

```
tips2$tip_groups
```

```
## Warning: Unknown or uninitialised column: `tip_groups`.
```

```
## NULL
```

```
ggplot(data = tips2) +
  aes(x = cat_RTO, y = media_prop_abortos, color = cat_DAP) +
  geom_line(aes(group = cat_DAP))
```




```
cut_prob <- ifelse(fitted(model2) > 0.5, 1, 0)
table(model2$y, cut_prob)
```

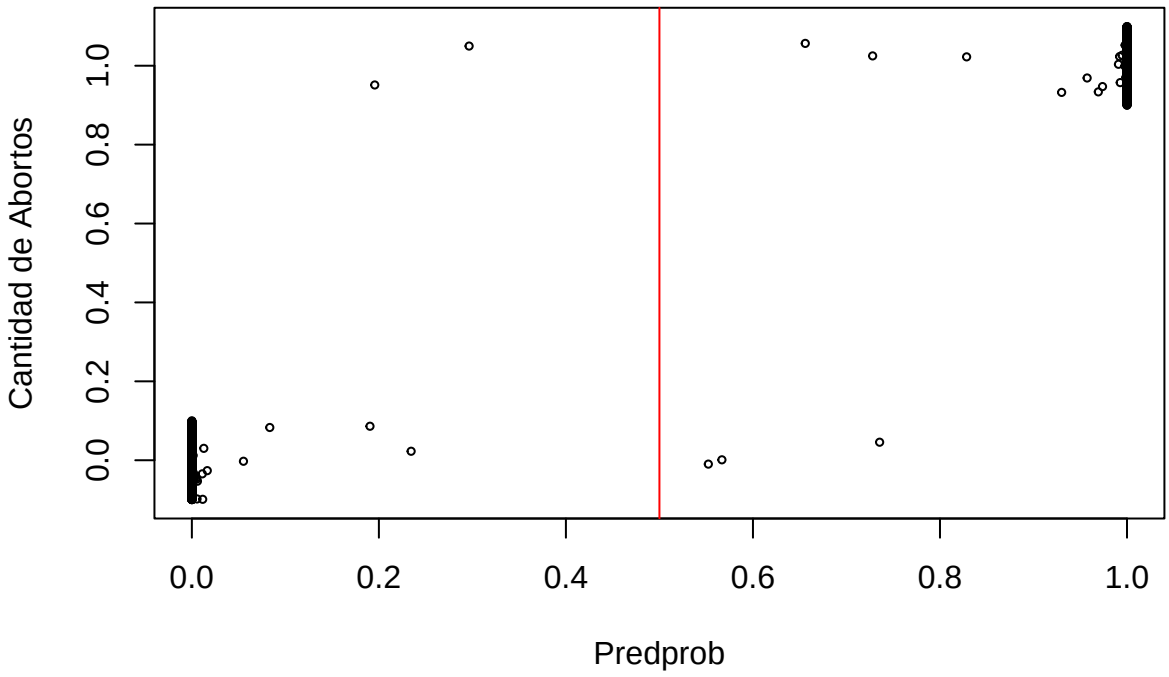
```
##    cut_prob
##       0   1
##   0 767   3
##   1   2 493
```

```
hoslem.test(model2$y, fitted(model2))
```

```
##
##  Hosmer and Lemeshow goodness of fit (GOF) test
##
## data:  model2$y, fitted(model2)
## X-squared = 0.030762, df = 8, p-value = 1
```

Como el p_value es menor a 0.05 si hay diferencias significativas entrevalores observados y predichos

```
Predprob<-predict(model2,type="response")
plot(Predprob,jitter(as.numeric(dfa$Abortos),0.5), cex=0.5, ylab="Cantidad de Abortos")
abline(v = 0.5, col = 'red')
```


Cantidad de Abortos
0.0
0.2
0.4
0.6
0.8
1.0
Predprob
0.0
0.2
0.4
0.6
0.8
1.0