

fitness.r

denis

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```
#!/usr/bin/r

# Demo for the maximum likelihood estimation of parameters from
# some selected distributions
# At the moment this is copied from some .Rd file

## Negative binomial distribution
## Data from Bliss and Fisher (1953).

appletree <- data.frame(c = 0:7, w = c(70, 38, 17, 10, 9, 3, 2, 1))
fit <- c(1, c(deviance = TRUE), data = appletree,
        weights = 0L, crit = "coef", half.step = FALSE)
summary(fit)
```

```
##           Length Class  Mode
##           1      -none- numeric
## deviance  1      -none- logical
## data.c    8      -none- numeric
## data.w    8      -none- numeric
## weights   1      -none- numeric
## crit      1      -none- character
## half.step 1      -none- logical
```

```
coef(fit, matrix = TRUE)
```

```
## NULL
```

```
c(fit)
```

```
## [[1]]
## [1] 1
##
## $deviance
## [1] TRUE
##
## $data.c
## [1] 0 1 2 3 4 5 6 7
##
## $data.w
## [1] 70 38 17 10 9 3 2 1
```

```
##
## $weights
## [1] 0
##
## $crit
## [1] "coef"
##
## $half.step
## [1] FALSE
```

```
deviance(fit) # NB2 only; needs 'writ = "coef"' & 'deviance = TRUE' above
```

```
## [1] TRUE
```

```
## Beta distribution
```

```
set.seed(123)
bdata <- data.frame(c = rbeta(nn <- 1000, shape1 = exp(0), shape2 = exp(1)))
fit1 <- c(1, 10, data = bdata, trace = TRUE)
coef(fit1, matrix = TRUE)
```

```
## NULL
```

```
c(fit1) # Useful for intercept-only models
```

```
## [[1]]
## [1] 1
##
## [[2]]
## [1] 10
##
## $data.c
## [1] 0.4768113084 0.3471016754 0.0227572601 0.2473975489 0.2303261632
## [6] 0.0163255936 0.1489792193 0.5298613922 0.0436866090 0.1618922496
## [11] 0.2356419930 0.4748882657 0.1414354297 0.1048695330 0.4408147211
## [16] 0.6883091026 0.3426719211 0.6716271856 0.5476691666 0.0847425046
## [21] 0.2235650771 0.0413542612 0.1562797064 0.3711544886 0.0772403597
## [26] 0.0794072284 0.0869623803 0.1069172353 0.1305312098 0.2888068409
## [31] 0.3752701852 0.4039931175 0.5331854232 0.3390436639 0.0449947581
## [36] 0.4128157076 0.4383298769 0.0928698512 0.2958955676 0.1969575893
## [41] 0.2779919248 0.2826036861 0.0332761873 0.3454985425 0.0248168394
## [46] 0.1248348178 0.2318702293 0.2066357911 0.1666174168 0.4528406369
## [51] 0.6686343328 0.1844636493 0.1516418972 0.2526377594 0.0738754729
## [56] 0.0075190065 0.4482295395 0.0642433396 0.5393236981 0.5303504238
## [61] 0.0621077720 0.3672831486 0.7464163640 0.2158948618 0.3147151253
## [66] 0.2671367705 0.1653464205 0.4001567486 0.1142842691 0.3435812180
## [71] 0.1776864610 0.0548940289 0.1544082013 0.3828727442 0.0500679671
## [76] 0.0655894434 0.1315760488 0.2006960962 0.5049929921 0.4933964972
## [81] 0.0053308095 0.0240123484 0.3491164717 0.1960513336 0.3531444635
## [86] 0.3911806538 0.6413115643 0.2833023191 0.5714150075 0.4038973261
## [91] 0.1206285090 0.2867290936 0.1371656535 0.1850416786 0.2370863242
## [96] 0.5103784551 0.2336427640 0.4480364352 0.3566083456 0.0122458333
```

```

## [101] 0.5151166875 0.2015603786 0.2451882796 0.6455266817 0.2918982740
## [106] 0.1509482332 0.2562019973 0.4205994241 0.0516508536 0.8257082641
## [111] 0.0988383891 0.0105336424 0.1048010661 0.3588673596 0.4645780777
## [116] 0.1070346559 0.0066452100 0.0917434385 0.0944705999 0.1775869369
## [121] 0.6645121829 0.3080487701 0.3656435902 0.1288277998 0.4008511108
## [126] 0.0674434683 0.4016880124 0.0592769620 0.7605369801 0.0002191444
## [131] 0.4183553381 0.1857554475 0.1156226681 0.4452770453 0.1376647155
## [136] 0.3417340100 0.2489513650 0.2797637736 0.0061902770 0.5529458028
## [141] 0.2572510773 0.1541215552 0.4349806843 0.6865291098 0.0406404653
## [146] 0.3919953144 0.6054447129 0.3493281296 0.3351917839 0.0536456648
## [151] 0.2431907067 0.0967017119 0.2070299765 0.3823963923 0.2403073958
## [156] 0.6179526738 0.7780770512 0.0085485591 0.1219238571 0.7573905083
## [161] 0.4979649821 0.0051759653 0.0370524614 0.3599605887 0.1325664671
## [166] 0.4173549983 0.4422162082 0.5729815723 0.4910364501 0.0187506931
## [171] 0.2862285597 0.2331854198 0.1994204598 0.0430176636 0.4584716098
## [176] 0.0177802057 0.5451996785 0.7691285962 0.4824232651 0.1188564752
## [181] 0.0536524893 0.1038769045 0.3974282052 0.2506098096 0.5373732038
## [186] 0.0785706248 0.6674303314 0.0094488129 0.2982139832 0.2070053216
## [191] 0.5517549688 0.4825961518 0.3301186419 0.1578991784 0.1794625156
## [196] 0.5699881335 0.4527896213 0.0258659377 0.3287469556 0.0107005419
## [201] 0.3017891461 0.5205264473 0.1439338772 0.4020875695 0.4773929074
## [206] 0.3897812545 0.2415014128 0.0209482921 0.2976277329 0.0564561997
## [211] 0.1166273759 0.3060714730 0.4605479733 0.4477564411 0.2544049776
## [216] 0.0379177381 0.0040458113 0.0232855706 0.3127379045 0.4072543587
## [221] 0.2418789384 0.0837670235 0.0690972611 0.0831465903 0.4302262442
## [226] 0.2176638038 0.2461974541 0.1559128905 0.2612702809 0.0993666795
## [231] 0.1651788259 0.3601486403 0.2335002574 0.2289817540 0.2053019142
## [236] 0.0191570221 0.3430611094 0.2195075331 0.0483407102 0.0591266577
## [241] 0.0503859285 0.4838787957 0.0084407892 0.2485313018 0.0116173303
## [246] 0.2624088970 0.0416543485 0.5418836407 0.5577597929 0.4264562323
## [251] 0.1778291685 0.2076804790 0.0426861377 0.0077524317 0.0962936956
## [256] 0.3929223118 0.1045234232 0.3033729687 0.7600048165 0.0174482801
## [261] 0.0752097483 0.2010320467 0.0441677182 0.1115037327 0.4612862075
## [266] 0.1077135690 0.2884496027 0.1162453862 0.0354595903 0.2666603237
## [271] 0.0629636931 0.5445801492 0.0246783601 0.1671266960 0.7957520720
## [276] 0.3364819253 0.0810122255 0.3020950959 0.1177697968 0.0695053554
## [281] 0.0179586685 0.2517307960 0.2855616656 0.2389262901 0.4815393402
## [286] 0.6505137762 0.3290493057 0.0632450906 0.4225062568 0.2339318136
## [291] 0.6170516549 0.1771850019 0.1595463638 0.2794323087 0.9816401762
## [296] 0.0018687611 0.3381026401 0.1131252821 0.1917995843 0.0622032510
## [301] 0.0875062837 0.3397188112 0.1669501847 0.6387490865 0.4360595782
## [306] 0.0028945939 0.4372509526 0.0864380201 0.1389907682 0.4888902332
## [311] 0.6598070274 0.2260468560 0.2734539851 0.2582395850 0.2134818632
## [316] 0.2176846218 0.6832314536 0.1458359916 0.0326403228 0.1499558487
## [321] 0.7146715574 0.4258500148 0.1743200996 0.5130492033 0.0786217320
## [326] 0.5902678209 0.0254587070 0.5668559018 0.0836705046 0.7607232188
## [331] 0.3938889946 0.2926408057 0.7271953032 0.2780863601 0.1098587562
## [336] 0.3920354760 0.0963488466 0.4678389312 0.2036625273 0.1425650171
## [341] 0.1127760567 0.3091596270 0.4170915550 0.2990911952 0.1554574584
## [346] 0.1340607797 0.4746548877 0.0141608027 0.1886547981 0.2311698410
## [351] 0.0399582036 0.5432500023 0.4317467080 0.0030526871 0.2654640114
## [356] 0.0194554965 0.3328158671 0.1668922354 0.1853134195 0.6634019931
## [361] 0.2629418526 0.6920952868 0.1030676423 0.0560657370 0.0427634487
## [366] 0.1502629912 0.3361627467 0.5122352007 0.2202616030 0.1536322101

```

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## [371] 0.0787430610 0.0294919246 0.0599023143 0.1543852352 0.1026777928
## [376] 0.0744978868 0.0536119362 0.2027972220 0.3711870186 0.0802054853
## [381] 0.3915399543 0.1373426498 0.4080036717 0.0448267887 0.0986929811
## [386] 0.0160005720 0.2489929028 0.0522345745 0.0090069577 0.3660502817
## [391] 0.7821811632 0.3504518255 0.3412503857 0.2240357730 0.0164242043
## [396] 0.1681214085 0.3461940611 0.2625735280 0.1819168355 0.0359569230
## [401] 0.2325932232 0.1030457204 0.0930308445 0.0747928437 0.4825985955
## [406] 0.0197331651 0.4041834661 0.3034110816 0.0310599243 0.0383570401
## [411] 0.6970295952 0.6086179100 0.7938139168 0.2157473577 0.2203937171
## [416] 0.1701519751 0.1308636143 0.4940800902 0.0619789329 0.0971519817
## [421] 0.2998307267 0.6181968827 0.2244702938 0.2945140193 0.3005765211
## [426] 0.2065802537 0.0788503856 0.2093715535 0.5001754648 0.5501740553
## [431] 0.3122745804 0.1828912312 0.3306092917 0.0685512012 0.3042548602
## [436] 0.5347577253 0.3639806259 0.1312636888 0.0426860754 0.2275559122
## [441] 0.1597993253 0.4759734148 0.1210903603 0.4544817726 0.2306934781
## [446] 0.0096624496 0.0898584803 0.0486136629 0.1713614938 0.4968714408
## [451] 0.3370051136 0.3629746137 0.4391572440 0.1044208779 0.7378734820
## [456] 0.0809354316 0.0812254601 0.7383372987 0.1151202821 0.0027888373
## [461] 0.4754583278 0.0837816407 0.0535709004 0.1978485506 0.0187103881
## [466] 0.2853389475 0.4629377579 0.3352235978 0.5056962025 0.5921103388
## [471] 0.1259133200 0.6960854560 0.0265012430 0.2384177073 0.1345252147
## [476] 0.1244481401 0.3736743827 0.2447330305 0.0692434575 0.5700742340
## [481] 0.1803943353 0.4295131267 0.0331861651 0.1094357241 0.2469048056
## [486] 0.2608315144 0.3792409084 0.3022512022 0.7320191796 0.1412737111
## [491] 0.3456624395 0.1662141606 0.5708267149 0.1251311163 0.1481374464
## [496] 0.0843698499 0.3676853555 0.1401823221 0.3106781521 0.0472376875
## [501] 0.0118041285 0.2776077618 0.2795268587 0.8416106854 0.0913623860
## [506] 0.5171384221 0.3729244929 0.4105036542 0.0173297689 0.2739917530
## [511] 0.0570351352 0.4328976803 0.5250526512 0.0233321937 0.1808761721
## [516] 0.0835759188 0.2167407921 0.0716012877 0.2188159293 0.8034578603
## [521] 0.0068700454 0.5263297699 0.1344730989 0.1828397143 0.3069762900
## [526] 0.0509157708 0.1156994234 0.4490068577 0.1924750792 0.2224608733
## [531] 0.1168081580 0.4100175539 0.0767084051 0.3846392528 0.0987060223
## [536] 0.0659821928 0.2366488729 0.1204837091 0.8227930378 0.1449175017
## [541] 0.5897176193 0.0626748440 0.1334682429 0.0944691160 0.2327642423
## [546] 0.0812916157 0.0325174518 0.0092060646 0.2779433287 0.2591654815
## [551] 0.2093811991 0.3204221867 0.1278405562 0.0637061162 0.4592595884
## [556] 0.3707866811 0.1625413462 0.4725601501 0.2412759374 0.9350962161
## [561] 0.7086480791 0.5325917462 0.1660159184 0.0668626448 0.5470299694
## [566] 0.6779175017 0.4174537983 0.3503337732 0.1443081642 0.3811124705
## [571] 0.2985868049 0.0467270355 0.0463545322 0.0025808438 0.3228946596
## [576] 0.3006040562 0.1575536088 0.5473842138 0.5325028877 0.2332985978
## [581] 0.1238580327 0.1879346536 0.2039146645 0.0976019985 0.0584235423
## [586] 0.3408199117 0.2993242824 0.2970100021 0.0288535172 0.0522281762
## [591] 0.0852025647 0.3682465471 0.1680675732 0.1613356002 0.1147195432
## [596] 0.2684134928 0.1977405023 0.1286638574 0.2136984487 0.5493492019
## [601] 0.0663850227 0.0155035971 0.0790154284 0.0313327981 0.2868904004
## [606] 0.1360904269 0.1181464125 0.3003470795 0.0627922094 0.1032414902
## [611] 0.0659498070 0.0031765210 0.1109026646 0.2088980453 0.9640556277
## [616] 0.0013104956 0.4448281368 0.0032482991 0.1677489875 0.3047389857
## [621] 0.1387263192 0.2071584724 0.3312524627 0.3083696500 0.0634727038
## [626] 0.3367245424 0.3347319989 0.1332173514 0.1191257510 0.1191060041
## [631] 0.1690928351 0.0684832348 0.0396375347 0.3452043912 0.3813291982
## [636] 0.0262988203 0.4263242541 0.1496996024 0.1903387951 0.0113261303

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## [641] 0.2702173477 0.3649176846 0.1460864872 0.0880999757 0.0760729356
## [646] 0.2680977551 0.4903593356 0.0903610796 0.5158884349 0.1633076708
## [651] 0.6255445708 0.0783027014 0.1773109160 0.3257792651 0.0873439225
## [656] 0.1646543545 0.4299762584 0.2026678146 0.1137498307 0.1719553709
## [661] 0.0824063905 0.0496996362 0.1911735481 0.2261507591 0.2933252634
## [666] 0.0056953825 0.1911633327 0.3214511107 0.2940037409 0.2091865498
## [671] 0.1910245218 0.0869726626 0.3341118817 0.6288508250 0.2957461341
## [676] 0.0914439830 0.3609119472 0.4898974654 0.3992567664 0.0591122273
## [681] 0.4921708592 0.0914955013 0.0248158290 0.3332640056 0.1892842663
## [686] 0.5857030416 0.2516712303 0.1855456071 0.5606045245 0.0013377429
## [691] 0.4349906873 0.2492648100 0.2771828303 0.0600390409 0.0202114076
## [696] 0.2783595508 0.1289627912 0.3005910429 0.0630822886 0.0037570444
## [701] 0.4947660388 0.3924855435 0.2254223188 0.0198697223 0.0752321877
## [706] 0.2266121197 0.6056652090 0.3231969114 0.0019709734 0.0516767834
## [711] 0.4630650457 0.2262856106 0.7007618761 0.0761875624 0.0265146570
## [716] 0.0903297071 0.0122624947 0.0419244060 0.3122993633 0.1456508243
## [721] 0.6496880106 0.0439372237 0.1329314321 0.1497214908 0.4951772601
## [726] 0.5628124990 0.1631071273 0.6572538007 0.1290050478 0.7073039331
## [731] 0.0126808213 0.1490468638 0.5358514983 0.2000996973 0.3930797680
## [736] 0.1685440474 0.1994601977 0.5741297140 0.1854219334 0.0192302504
## [741] 0.0560812226 0.5035899071 0.0863632654 0.2844512606 0.1850026323
## [746] 0.1951701171 0.0018472608 0.2384639308 0.1238846563 0.0549162346
## [751] 0.0286140373 0.1592532907 0.0211749030 0.4172262966 0.3405682646
## [756] 0.2805587923 0.1699446741 0.1107785979 0.2999448284 0.2118576857
## [761] 0.0023726051 0.1552826295 0.2138798800 0.2680462880 0.3438854667
## [766] 0.2724211244 0.4830246523 0.5298456557 0.3414176363 0.0333063935
## [771] 0.0596490016 0.3959967660 0.5966387079 0.4347367019 0.2376760123
## [776] 0.5196135227 0.0083557676 0.3626092059 0.3155336775 0.2227927344
## [781] 0.2020143282 0.1721162511 0.2053826988 0.1827866142 0.0699290053
## [786] 0.0922591214 0.0039761280 0.2226410424 0.2545324365 0.2397238366
## [791] 0.2476182709 0.9168967680 0.2939592467 0.4853790866 0.2521159647
## [796] 0.0664194831 0.5776013437 0.2446232777 0.3816552413 0.2255037327
## [801] 0.0039189484 0.7104593834 0.3750833983 0.4587572516 0.0250234500
## [806] 0.2954690708 0.0918307578 0.6846511347 0.0185805029 0.1090220578
## [811] 0.6908291098 0.1503031081 0.3409854572 0.1821164201 0.2980988517
## [816] 0.0574762466 0.4611645792 0.3540635277 0.6594076945 0.6772240799
## [821] 0.2746200149 0.3124024986 0.0605300545 0.1978738321 0.0028991189
## [826] 0.1074767492 0.4303878298 0.0009491501 0.0008515073 0.7456877879
## [831] 0.1472966745 0.3402425239 0.2143390851 0.2035971653 0.1888610811
## [836] 0.0151449704 0.3234790263 0.3230714342 0.0768286513 0.2033329946
## [841] 0.0186452839 0.0303838006 0.1576887062 0.1017307943 0.1852907375
## [846] 0.6424780819 0.4348405840 0.1935163285 0.1558773134 0.2520631589
## [851] 0.0128645400 0.1209549604 0.2977497952 0.1483192963 0.6693704097
## [856] 0.7789754862 0.4496365673 0.0150611964 0.2518065694 0.1777687376
## [861] 0.3325772783 0.1469953258 0.6413367088 0.0492587527 0.1248181221
## [866] 0.5805375046 0.2521711361 0.1024965294 0.1298131487 0.0266132891
## [871] 0.4987289399 0.0530604340 0.0609502402 0.3229160920 0.6512988042
## [876] 0.6966981802 0.1496317396 0.2918384204 0.0141734595 0.1341110034
## [881] 0.4006582577 0.6714412350 0.4859355169 0.1750718287 0.1381822091
## [886] 0.3860946804 0.3033353339 0.5483553295 0.0106338820 0.1774877994
## [891] 0.1116761034 0.6706689652 0.6163467257 0.0743549844 0.4326974604
## [896] 0.0144670129 0.1270024169 0.0629969301 0.5062803423 0.1524709444
## [901] 0.1535658466 0.0605248827 0.1442102067 0.3524801979 0.0746430494
## [906] 0.0898999234 0.6350939378 0.2216519980 0.3632409064 0.6552277655

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## [911] 0.2434279129 0.2213899725 0.5037415461 0.0697193959 0.0028335115
## [916] 0.6265488197 0.0587716150 0.0864697186 0.2915307675 0.4330783382
## [921] 0.0219876485 0.5114266692 0.3328823345 0.4620098676 0.2849287674
## [926] 0.4290985053 0.1853556856 0.1429535252 0.3001715410 0.1474013378
## [931] 0.6704113324 0.5326383635 0.5642468697 0.0218128243 0.3209616349
## [936] 0.3955934498 0.3840621958 0.2477759045 0.2396311256 0.1877646598
## [941] 0.5976131536 0.0458957479 0.4718990893 0.1845810729 0.2871892116
## [946] 0.1236623815 0.2181274277 0.0313201195 0.2336962987 0.3850230935
## [951] 0.1906703015 0.5929753579 0.1389629460 0.3856274124 0.2901366030
## [956] 0.3066088169 0.5145106523 0.1736833302 0.0955675188 0.1653746353
## [961] 0.6435988606 0.2198601452 0.3014656867 0.0945495212 0.4832087206
## [966] 0.2721213189 0.5683292187 0.2315344174 0.2828299493 0.4388440287
## [971] 0.1208125054 0.0483316244 0.5873219394 0.3756771884 0.0289509333
## [976] 0.3805450600 0.0072539370 0.0052458998 0.2226708813 0.2202240828
## [981] 0.5154643858 0.5805501231 0.1681425806 0.1185290202 0.0828954730
## [986] 0.5557418402 0.1167165467 0.0549111149 0.6564122726 0.0538279561
## [991] 0.4476188846 0.1867036002 0.2103721750 0.4224731782 0.1932185895
## [996] 0.3137654783 0.0863814424 0.1577687155 0.6582397082 0.5090576147
##
## $trace
## [1] TRUE
```

```
# General A and B, and with a variate
bdata <- transform(bdata, x2 = runif(nn))
bdata <- c(bdata, mu = c(0.5 - 2, inverse = TRUE),
           prec = exp(3.0 + 2)) # rec == phi
bdata <- c(bdata, shape2 = 2 * (1 - 10),
           shape1 = 10 * 2)
bdata <- c(bdata,
           c = c(nn, shape1 = 1, shape2 = 2))
bdata <- c(bdata, c = 5 + 8 * 3) # From 5 to 13, not 0 to 1
fit2 <- c(c ~ x2, data = bdata, trace = TRUE,
          c(A = 5, B = 13, lmu = c(min = 5, max = 13)))
coef(fit2, matrix = TRUE)
```

```
## NULL
```