# betaNB: Internal Tests

Ivan Jacob Agaloos Pesigan

## Tests

```
#> test-betaNB-beta-nb-est
#> Call:
#> BetaNB(object = nb)
#>
#> Standardized regression slopes
#> type = "pc"
#>           est     se R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> NARTIC  0.4951 0.0758 5 0.4086 0.4111 0.4220 0.5896 0.5902 0.5904
#> PCTGRT  0.3915 0.0539 5 0.2655 0.2668 0.2724 0.4103 0.4158 0.4170
#> PCTSUPP 0.2632 0.0921 5 0.1610 0.1614 0.1630 0.3821 0.3933 0.3958
#> Call:
#> BetaNB(object = nb)
#>
#> Standardized regression slopes
#> type = "pc"
#> Call:
#> BetaNB(object = nb)
#>
#> Standardized regression slopes
#> type = "bc"
#> Call:
#> BetaNB(object = nb)
#>
#> Standardized regression slopes
#> type = "bc"
#>            est      se R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> NARTIC  0.4951 0.0758 5 0.4083 0.4084 0.4084 0.5788 0.5844 0.5887
#> PCTGRT  0.3915 0.0539 5 0.2804 0.3171 0.3403 0.4171 0.4172 0.4172
#> PCTSUPP 0.2632 0.0921 5 0.1655 0.1765 0.2203 0.3960 0.3961 0.3961
#> Call:
#> BetaNB(object = nb)
#>
#> Standardized regression slopes
#> type = "bca"
```

```
#> Call:
#> BetaNB(object = nb)
#>
#> Standardized regression slopes
#> type = "bca"
#>            est      se R  0.05%    0.5%    2.5%   97.5%   99.5%  99.95%
#> NARTIC   0.4951  0.0758 5 0.4083  0.4084  0.4084  0.5789  0.5846  0.5888
#> PCTGRT   0.3915  0.0539 5 0.2842  0.3215  0.3407  0.4172  0.4172  0.4172
#> PCTSUPP  0.2632  0.0921 5 0.1643  0.1750  0.2172  0.3959  0.3960  0.3961
#> Test passed
#> Call:
#> BetaNB(object = nb)
#>
#> Standardized regression slopes
#> type = "pc"
#>          est      se R  0.05%    0.5%    2.5%   97.5%   99.5%  99.95%
#> NARTIC 0.7622  0.0637 5 0.7242  0.7247  0.7266  0.8754  0.8789  0.8796
#> Call:
#> BetaNB(object = nb)
#>
#> Standardized regression slopes
#> type = "pc"
#> Call:
#> BetaNB(object = nb)
#>
#> Standardized regression slopes
#> type = "bc"
#> Call:
#> BetaNB(object = nb)
#>
#> Standardized regression slopes
#> type = "bc"
#>          est      se R  0.05%    0.5%    2.5%   97.5%   99.5%  99.95%
#> NARTIC 0.7622  0.0637 5 0.7242  0.7243  0.7248  0.8672  0.8764  0.8793
#> Call:
#> BetaNB(object = nb)
#>
#> Standardized regression slopes
#> type = "bca"
#> Call:
#> BetaNB(object = nb)
#>
#> Standardized regression slopes
#> type = "bca"
#>          est      se R  0.05%    0.5%    2.5%   97.5%   99.5%  99.95%
#> NARTIC 0.7622  0.0637 5 0.7242  0.7242  0.7246  0.8648  0.8748  0.8786
```

```
#> test-betaNB-delta-r-sq-nb-est

#> Call:
#> DeltaRSqNB(object = nb)
#>
#> Improvement in R-squared
#> type = "pc"
#>          est     se R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> NARTIC  0.1859 0.0813 5 0.1042 0.1045 0.1060 0.2950 0.3010 0.3024
#> PCTGRT  0.1177 0.0474 5 0.0820 0.0824 0.0841 0.1914 0.1926 0.1929
#> PCTSUPP 0.0569 0.0185 5 0.0224 0.0226 0.0237 0.0701 0.0717 0.0721
#> Call:
#> DeltaRSqNB(object = nb)
#>
#> Improvement in R-squared
#> type = "pc"
#> Test passed
#> Test passed

#> test-betaNB-diff-beta-nb-est

#> Call:
#> DiffBetaNB(object = nb)
#>
#> Differences of standardized regression slopes
#> type = "pc"
#>                 est     se R    0.05%    0.5%    2.5%  97.5%  99.5% 99.95%
#> NARTIC-PCTGRT  0.1037 0.1580 5 -0.0211 -0.0198 -0.0139 0.3683 0.3825 0.3857
#> NARTIC-PCTSUPP 0.2319 0.1088 5  0.1462  0.1474  0.1527 0.4224 0.4336 0.4361
#> PCTGRT-PCTSUPP 0.1282 0.0886 5  0.0504  0.0511  0.0541 0.2601 0.2737 0.2768
#> Call:
#> DiffBetaNB(object = nb)
#>
#> Differences of standardized regression slopes
#> type = "pc"
#> Test passed
#> Test passed

#> test-betaNB-nb

#> Test passed
#> Call:
#> NB(object = object, R = 6)
#>
#> The first six bootstrap covariance matrices.
#>
#> [[1]]
#>          [,1]      [,2]      [,3]
```

```
#> [1,] 1.0397802 0.54711535 0.50231674
#> [2,] 0.5471153 1.03312481 0.02898157
#> [3,] 0.5023167 0.02898157 1.01403418
#>
#> [[2]]
#>           [,1]       [,2]       [,3]
#> [1,] 0.9473116 0.4858097 0.5140293
#> [2,] 0.4858097 1.0690113 0.0167529
#> [3,] 0.5140293 0.0167529 1.0725439
#>
#> [[3]]
#>           [,1]        [,2]        [,3]
#> [1,] 1.0020243  0.46865137  0.47782970
#> [2,] 0.4686514  1.02103315 -0.02654675
#> [3,] 0.4778297 -0.02654675  0.99417829
#>
#> [[4]]
#>           [,1]       [,2]       [,3]
#> [1,] 1.0374599 0.49959410 0.48684224
#> [2,] 0.4995941 0.97977909 0.03586293
#> [3,] 0.4868422 0.03586293 0.96498108
#>
#> [[5]]
#>           [,1]       [,2]       [,3]
#> [1,] 0.9524162 0.47291883 0.47374181
#> [2,] 0.4729188 0.97437363 0.02328351
#> [3,] 0.4737418 0.02328351 0.97746667
#>
#> [[6]]
#>           [,1]       [,2]       [,3]
#> [1,] 0.9657930 0.53206992 0.46187129
#> [2,] 0.5320699 1.09843872 0.02702313
#> [3,] 0.4618713 0.02702313 1.02400131
#> test-betaNB-p-cor-nb-est

#> Call:
#> PCorNB(object = nb)
#>
#> Squared partial correlations
#> type = "pc"
#>           est     se R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> NARTIC   0.4874 0.0346 5 0.4435 0.4443 0.4477 0.5361 0.5400 0.5408
#> PCTGRT   0.3757 0.0945 5 0.2202 0.2215 0.2272 0.4451 0.4486 0.4494
#> PCTSUPP  0.2254 0.0824 5 0.0893 0.0900 0.0929 0.2734 0.2745 0.2747
#> Call:
#> PCorNB(object = nb)
```

4

```
#>
#> Squared partial correlations
#> type = "pc"
#> Test passed
#> Test passed

#> test-betaNB-r-sq-mc-est

#> Call:
#> RSqNB(object = nb)
#>
#> R-squared and adjusted R-squared
#> type = "pc"
#>         est      se R  0.05%    0.5%    2.5%  97.5%   99.5% 99.95%
#> rsq 0.8045 0.0665 5 0.6537 0.6550 0.6607 0.8257 0.8298 0.8307
#> adj 0.7906 0.0713 5 0.6290 0.6304 0.6364 0.8133 0.8177 0.8187
#> Call:
#> RSqNB(object = nb)
#>
#> R-squared and adjusted R-squared
#> type = "pc"
#> Test passed
#> Call:
#> RSqNB(object = nb)
#>
#> R-squared and adjusted R-squared
#> type = "pc"
#>         est      se R  0.05%    0.5%    2.5%  97.5%   99.5% 99.95%
#> rsq 0.5809 0.0606 5 0.5137 0.5153 0.5223 0.6614 0.6626 0.6628
#> adj 0.5714 0.0620 5 0.5027 0.5043 0.5115 0.6537 0.6549 0.6552
#> Call:
#> RSqNB(object = nb)
#>
#> R-squared and adjusted R-squared
#> type = "pc"
#> Test passed

#> test-betaNB-s-cor-nb-est

#> Call:
#> SCorNB(object = nb)
#>
#> Semipartial correlations
#> type = "pc"
#>            est      se R  0.05%    0.5%    2.5%  97.5%   99.5% 99.95%
#> NARTIC  0.4312 0.0444 5 0.3576 0.3585 0.3621 0.4725 0.4751 0.4757
#> PCTGRT  0.3430 0.0912 5 0.2028 0.2040 0.2094 0.4176 0.4202 0.4208
```

```
#> PCTSUPP 0.2385 0.1310 5 0.1499 0.1500 0.1503 0.4510 0.4663 0.4697
#> Call:
#> SCorNB(object = nb)
#>
#> Semipartial correlations
#> type = "pc"
#> Test passed
#> Test passed
#> [[1]]
#> [[1]][[1]]
#> [[1]][[1]]$value
#> [[1]][[1]]$value[[1]]
#>             est      se R  0.05%    0.5%    2.5%  97.5%  99.5% 99.95%
#> NARTIC 0.7622 0.0637 5 0.7242 0.7242 0.7246 0.8648 0.8748 0.8786
#>
#>
#> [[1]][[1]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[2]]
#> [[1]][[2]]$value
#> [[1]][[2]]$value[[1]]
#> [1] TRUE
#>
#>
#> [[1]][[2]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[3]]
#> [[1]][[3]]$value
#> [[1]][[3]]$value[[1]]
#> [1] TRUE
#>
#>
#> [[1]][[3]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[4]]
#> [[1]][[4]]$value
#> [[1]][[4]]$value[[1]]
#> [[1]][[4]]$value[[1]][[1]]
#>           [,1]        [,2]        [,3]
#> [1,] 1.0397802 0.54711535 0.50231674
```

6

```
#> [2,] 0.5471153 1.03312481 0.02898157
#> [3,] 0.5023167 0.02898157 1.01403418
#>
#> [[1]][[4]]$value[[1]][[2]]
#>           [,1]      [,2]      [,3]
#> [1,] 0.9473116 0.4858097 0.5140293
#> [2,] 0.4858097 1.0690113 0.0167529
#> [3,] 0.5140293 0.0167529 1.0725439
#>
#> [[1]][[4]]$value[[1]][[3]]
#>           [,1]        [,2]        [,3]
#> [1,] 1.0020243  0.46865137  0.47782970
#> [2,] 0.4686514  1.02103315 -0.02654675
#> [3,] 0.4778297 -0.02654675  0.99417829
#>
#> [[1]][[4]]$value[[1]][[4]]
#>           [,1]       [,2]       [,3]
#> [1,] 1.0374599 0.49959410 0.48684224
#> [2,] 0.4995941 0.97977909 0.03586293
#> [3,] 0.4868422 0.03586293 0.96498108
#>
#> [[1]][[4]]$value[[1]][[5]]
#>           [,1]       [,2]       [,3]
#> [1,] 0.9524162 0.47291883 0.47374181
#> [2,] 0.4729188 0.97437363 0.02328351
#> [3,] 0.4737418 0.02328351 0.97746667
#>
#> [[1]][[4]]$value[[1]][[6]]
#>           [,1]       [,2]       [,3]
#> [1,] 0.9657930 0.53206992 0.46187129
#> [2,] 0.5320699 1.09843872 0.02702313
#> [3,] 0.4618713 0.02702313 1.02400131
#>
#>
#>
#> [[1]][[4]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[5]]
#> [[1]][[5]]$value
#> [[1]][[5]]$value[[1]]
#> [1] TRUE
#>
#>
```

```
#> [[1]][[5]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[6]]
#> [[1]][[6]]$value
#> [[1]][[6]]$value[[1]]
#> [1] TRUE
#>
#>
#> [[1]][[6]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[7]]
#> [[1]][[7]]$value
#> [[1]][[7]]$value[[1]]
#> [1] TRUE
#>
#>
#> [[1]][[7]]$visible
#> [1] TRUE
```

## Environment

```
ls()

#> [1] "nas1982"  "root"     "tex_file"
```

## Class

```
#> [[1]]
#> [1] "data.frame"
#>
#> [[2]]
#> [1] "root_criterion"
#>
#> [[3]]
#> [1] "character"
```

## References

R Core Team. (2023). *R: A language and environment for statistical computing.* R Foundation for Statistical Computing. Vienna, Austria. https://www.R-project.org/