Duplicate extinction

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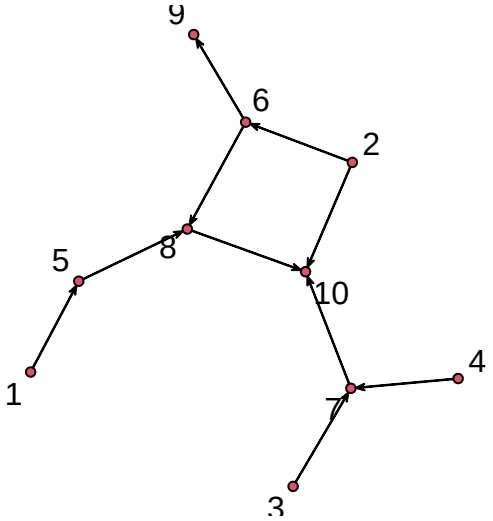
```
library(NetworkExtinction)
library(network)

data("net")
ch_data <- net

net_sim <- SimulateExtinctions(Network = net, Order = c(3, 4, 7, 10, 1, 5, 8, 2, 6, 9), Method = "Order

net_sim
```

```
##   Spp S L         C Link_density Modularity SecExt Pred_release Iso_nodes
## 1   3 9 9 0.1111111    1.0000000          0      0            0         0
## 2   4 8 8 0.1250000    1.0000000          0      1            0         0
## 3   7 7 7 0.1428571    1.0000000          0      0            0         0
## 4  10 6 5 0.1388889    0.8333333          0      0            1         0
## 5   1 5 4 0.1600000    0.8000000          0      1            1         0
## 6   5 4 3 0.1875000    0.7500000          0      0            1         0
## 7   8 3 2 0.2222222    0.6666667          0      0            0         0
## 8   2 2 1 0.2500000    0.5000000          0      1            0         0
## 9   6 1 0 0.0000000    0.0000000          0      1            0         1
##   AccSecExt NumExt TotalExt
## 1         0      1        1
## 2         1      2        3
## 3         1      3        4
## 4         1      4        5
## 5         2      5        7
## 6         2      6        8
## 7         2      7        9
## 8         3      8       11
## 9         4      9       13
```

```
plot.network(x = ch_data, label = network.vertex.names(ch_data))
```



It can be seen that the extinction of node 4 and node 3 results in secondary extinction of node 7. However, the function SimulateExtinctions does not check if node 7 is already extinct or not when it is asked for primary extinction of node 7 as can be seen from the result above. In the above case, node 7 is extinct twice: once in secondary extinction and next time in primary extinction. This eventually results in a total extinction of 13 nodes, however there are only 10 nodes in the network.

```
sessionInfo()
```

```
## R version 4.0.2 (2020-06-22)
## Platform: x86_64-apple-darwin17.0 (64-bit)
## Running under: macOS  10.16
##
## Matrix products: default
## BLAS:   /Library/Frameworks/R.framework/Versions/4.0/Resources/lib/libRblas.dylib
## LAPACK: /Library/Frameworks/R.framework/Versions/4.0/Resources/lib/libRlapack.dylib
##
## locale:
## [1] en_US.UTF-8/en_US.UTF-8/en_US.UTF-8/C/en_US.UTF-8/en_US.UTF-8
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## other attached packages:
## [1] network_1.17.1          NetworkExtinction_0.2.1
##
## loaded via a namespace (and not attached):
##  [1] sna_2.6              pillar_1.6.3         compiler_4.0.2
##  [4] iterators_1.0.13     tools_4.0.2          digest_0.6.28
##  [7] lattice_0.20-41      gtable_0.3.0         evaluate_0.14
## [10] lifecycle_1.0.1      tibble_3.1.4         pkgconfig_2.0.3
## [13] rlang_0.4.11         igraph_1.2.6         foreach_1.5.1
## [16] DBI_1.1.0            yaml_2.2.1           parallel_4.0.2
## [19] xfun_0.20            coda_0.19-4          dplyr_1.0.7
## [22] stringr_1.4.0        knitr_1.30           generics_0.1.0
## [25] vctrs_0.3.8          grid_4.0.2           tidyselect_1.1.1
## [28] glue_1.4.2           R6_2.5.1             fansi_0.5.0
## [31] rmarkdown_2.6        purrr_0.3.4          tidyr_1.1.4
## [34] ggplot2_3.3.5        blob_1.2.1           magrittr_2.0.1
```

```
## [37] scales_1.1.1         backports_1.2.1      codetools_0.2-16
## [40] ellipsis_0.3.2       htmltools_0.5.1.1    MASS_7.3-53.1
## [43] assertthat_0.2.1     colorspace_2.0-2     utf8_1.2.2
## [46] stringi_1.7.4        munsell_0.5.0        doParallel_1.0.16
## [49] broom_0.7.9          statnet.common_4.5.0 crayon_1.4.1
```