Homework 5

Nathaniel Haulk

10/28/2021

```
library("devtools")

#devtools::install_github("daijiang/neonDivData")

library("neonDivData")

library("tidyverse")
```

Question 1:

```
#sort(unique(data_plant$taxon_name))

## Pulls the genus for each plant
data_plant$genus = sub(" .*", "", data_plant$taxon_name)

## Selects a random number 100 times between 1 and the length of data_plant
i = sample(1:nrow(data_plant), 100, replace=FALSE)

## Records the genus at the random
genus_samp = data_plant$genus[i]

## Prints out 100 genus
print(genus_samp)
```

```
##   [1] "Ambrosia"          "Aristida"          "Panicum"
##   [4] "Rhus"              "Vulpia"            "Bromus"
##   [7] "Viola"             "Solanum"           "Carex"
##  [10] "Juncus"            "Chamaesyce"        "Lindera"
##  [13] "Vulpia"            "Uvularia"          "Ledum"
##  [16] "Pinus"             "Acer"              "Potentilla"
##  [19] "Tragopogon"        "Gaultheria"        "Rubus"
##  [22] "Salix"             "Ambrosia"          "Prunus"
##  [25] "Anemone"           "Sabal"             "Setaria"
##  [28] "Lycopodiella"      "Leersia"           "Pinus"
##  [31] "Malacothrix"       "Stylosanthes"      "Carex"
##  [34] "Convallaria"       "Pinus"             "Eriophorum"
##  [37] "Bouteloua"         "Arnica"            "Empetrum"
##  [40] "Rubus"             "Galium"            "Toxicodendron"
```

```
##  [43] "Dichanthelium"     "Hesperostipa"      "Hibiscus"
##  [46] "Dryas"             "Descurainia"       "Schizachyrium"
##  [49] "Vaccinium"         "Polygala"          "Dasyochloa"
##  [52] "Onoclea"           "Frasera"           "Vernonia"
##  [55] "Cephalanthus"      "Clarkia"           "Hesperostipa"
##  [58] "Quercus"           "Lonicera"          "Gymnanthes"
##  [61] "Xerophyllum"       "Lyonia"            "Trifolium"
##  [64] "Euphorbia"         "Elymus"            "Solidago"
##  [67] "Acer"              "Zizia"             "Krascheninnikovia"
##  [70] "Cylindropuntia"    "Rumex"             "Liatris"
##  [73] "Hibiscus"          "Helianthus"        "Liatris"
##  [76] "Rhus"              "Osmunda"           "Carex"
##  [79] "Anemone"           "Apodanthera"       "Polystichum"
##  [82] "Dasyochloa"        "Fraxinus"          "Echinacea"
##  [85] "Bromus"            "Juglans"           "Acer"
##  [88] "Vaccinium"         "Machaeranthera"    "Prosopis"
##  [91] "Anthoxanthum"      "Blechum"           "Phlox"
##  [94] "Andropogon"        "Cryptantha"        "Onoclea"
##  [97] "Aralia"            "Artemisia"         "Carya"
## [100] "Sanicula"
```

Question 2:

```
data_plant$taxon_name2 = sub("(\\w\\s\\w+).*", "\\1", data_plant$taxon_name)

## Selects a random number 100 times between 1 and the length of data_plant
i = sample(1:nrow(data_plant), 100, replace=FALSE)

## Records the genus and species name at the random
taxon2_samp = data_plant$taxon_name2[i]

## Prints out data
print(taxon2_samp)
```

```
##   [1] "Arctagrostis latifolia"     "Polygonatum biflorum"
##   [3] "Chamaesyce arizonica"       "Aristida adscensionis"
##   [5] "Lotus unifoliolatus"        "Desmanthus illinoensis"
##   [7] "Clitoria mariana"           "Festuca brachyphylla"
##   [9] "Tridens flavus"             "Vaccinium uliginosum"
##  [11] "Heuchera richardsonii"      "Grammitis hookeri"
##  [13] "Grindelia squarrosa"        "Aira caryophyllea"
##  [15] "Rosa arkansana"             "Mahonia nervosa"
##  [17] "Vernonia angustifolia"      "Echinocereus reichenbachii"
##  [19] "Vaccinium myrsinites"       "Bothriochloa ischaemum"
##  [21] "Sibbaldia procumbens"       "Symphoricarpos orbiculatus"
##  [23] "Poa pratensis"              "Sorghum bicolor"
##  [25] "Panicum dichotomiflorum"    "Polygonum perfoliatum"
##  [27] "Boehmeria cylindrica"       "Monotropa uniflora"
##  [29] "Acer negundo"               "Acer saccharum"
##  [31] "Viola sp"                   "Acalypha sp"
##  [33] "Dirca palustris"            "Pedicularis lapponica"
```

```
##  [35] "Betula alleghaniensis"      "Betula occidentalis"
##  [37] "Equisetum hyemale"          "Metrosideros polymorpha"
##  [39] "Rosa arkansana"             "Pinus palustris"
##  [41] "Tragopogon dubius"          "Vitis rotundifolia"
##  [43] "Populus tremuloides"        "Pteridium aquilinum"
##  [45] "Gymnocarpium sp"            "Elymus elymoides"
##  [47] "Eriogonum effusum"          "Lechea torreyi"
##  [49] "Lepidium densiflorum"       "Echinacea angustifolia"
##  [51] "Gymnanthes lucida"          "Euphorbia davidii"
##  [53] "Aristida purpurea"          "Ceanothus sp"
##  [55] "Trifolium microcephalum"    "Acalypha gracilens"
##  [57] "Rubus chamaemorus"          "Geranium columbinum"
##  [59] "Chamaesyce nutans"          "Achyranthes aspera"
##  [61] "Galactia volubilis"         "Ilex decidua"
##  [63] "Melochia pyramidata"        "Lactuca biennis"
##  [65] "Polygonum virginianum"      "Acer negundo"
##  [67] "Fragaria virginiana"        "Eriophorum russeolum"
##  [69] "Delphinium hansenii"        "Pteridium aquilinum"
##  [71] "Mycelis muralis"            "Athyrium filix"
##  [73] "Amianthium muscitoxicum"    "Carex spp"
##  [75] "Yucca elata"                "Eriophorum russeolum"
##  [77] "Pteridium aquilinum"        "Eriophorum vaginatum"
##  [79] "Lindera benzoin"            "Eriogonum effusum"
##  [81] "Uvularia perfoliata"        "Cornus florida"
##  [83] "Hibiscus laevis"            "Sedum sp"
##  [85] "Rubus trivialis"            "Galax urceolata"
##  [87] "Galium sp"                  "Eriophorum vaginatum"
##  [89] "Chamaecrista fasciculata"   "Lactuca tatarica"
##  [91] "Oxalis stricta"             "Veratrum sp"
##  [93] "Equisetum pratense"         "Ulmus sp"
##  [95] "Circaea lutetiana"          "Teucrium canadense"
##  [97] "Celastrus orbiculatus"      "Monarda fistulosa"
##  [99] "Serenoa repens"             "Amaranthus palmeri"
```

Question 3

```
## Creates data frame n_1 that counts the number of sample_areas with a size of 1 m2 in data_plant
n_1 = data_plant %>%
  group_by(siteID) %>%
  summarise(richness_1m2 = sum(sample_area_m2 == "1"))

## Creates data frame n_10 that counts the number of sample_areas with a size of 1 and 10 m2 in data_pl
n_10 = data_plant %>%
  group_by(siteID) %>%
  summarise(richness_10m2 = sum(sample_area_m2 == "1" | sample_area_m2 == "10"))

## Creates data frame n_100 that counts the number of sample_areas with a size of 1, 10, and 100 m2 in
n_100 = data_plant %>%
  group_by(siteID) %>%
  summarise(richness_100m2 = sum(sample_area_m2 == "1" | sample_area_m2 == "10"| sample_area_m2 == "100
```

```
## Joins n_1, n_10, n_100
n_all = left_join(n_1 ,n_10) %>%
  left_join(n_100)
```

```
## Joining, by = "siteID"
## Joining, by = "siteID"
```

```
## prints n_all
print(n_all)
```

```
## # A tibble: 47 x 4
##    siteID richness_1m2 richness_10m2 richness_100m2
##    <chr>         <int>         <int>          <int>
##  1 ABBY           7587         13603          16946
##  2 BARR           4615          6041           6616
##  3 BART           5875         10659          13354
##  4 BLAN           8803         15270          19798
##  5 BONA           4091          5925           6983
##  6 CLBJ          10226         15656          18328
##  7 CPER          23663         37876          44284
##  8 DCFS          12067         16649          19622
##  9 DEJU           8673         13000          14918
## 10 DELA          12012         22521          29326
## # ... with 37 more rows
```

Question 4

```
## creates n_all_longer that records site richness based off spatial scale.
n_all_longer = n_all %>%
  pivot_longer(!siteID, names_to = "spatial_scale", values_to = "richness")

## Prints dataframe
print(n_all_longer)
```

```
## # A tibble: 141 x 3
##    siteID spatial_scale  richness
##    <chr>  <chr>             <int>
##  1 ABBY   richness_1m2       7587
##  2 ABBY   richness_10m2     13603
##  3 ABBY   richness_100m2    16946
##  4 BARR   richness_1m2       4615
##  5 BARR   richness_10m2      6041
##  6 BARR   richness_100m2     6616
##  7 BART   richness_1m2       5875
##  8 BART   richness_10m2     10659
##  9 BART   richness_100m2    13354
## 10 BLAN   richness_1m2       8803
## # ... with 131 more rows
```

Question 5