Use pivot_wider and pivot_longer

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Step 1: Load your data.

```
library(tidyverse)
```

```
## -- Attaching core tidyverse packages ------------------------ tidyverse 2.0.0 --
## v dplyr     1.1.4     v readr     2.1.5
## v forcats   1.0.0     v stringr   1.5.1
## v ggplot2   3.5.1     v tibble    3.2.1
## v lubridate 1.9.3     v tidyr     1.3.1
## v purrr     1.0.2
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
## i Use the conflicted package (<http://conflicted.r-lib.org/>) to force all conflicts to become errors
```

```
langDivLengthen <- read.csv("language_diversity_pl.csv")
head(langDivLengthen)
```

```
##   Measurement Algeria  Angola Australia Bangladesh  Benin  Bolivia Botswana
## 1       Langs      18      42       234         37     52       38       27
## 2        Area 2381741 1246700   7713364     143998 112622  1098581   581730
## 3  Population   25660   10303     17336     118745   4889     7612     1348
## 4   Continent  Africa  Africa   Oceania       Asia Africa Americas   Africa
## 5          GS     6.6    6.22         6        7.4   7.14     6.92      4.6
##     Brazil Burkina.Faso    CAR Cambodia Cameroon    Chad Colombia  Congo
## 1      209           75     94       18      275     126       79     60
## 2  8511965       274000 622984   181035   475422 1284000  1138914 342000
## 3   153322         9242   3127     8442    12239    5819    33613   2346
## 4 Americas       Africa Africa     Asia   Africa  Africa Americas Africa
## 5     9.71         5.17   8.08     8.44     9.17       4    11.37    9.6
##   Costa.Rica Cote.d.Ivoire     Cuba  Ecuador   Egypt Ethiopia French.Guiana
## 1         10            75        1       22      11      112            11
## 2      51100        322463   110861   283561 1001449  1221900         90000
## 3       3064         12464    10736    10851   54688    53383           102
## 4   Americas        Africa Americas Americas  Africa   Africa      Americas
## 5       8.92          8.67     7.46     8.14    0.89     7.28          10.4
##    Gabon  Ghana Guatemala Guinea   Guyana Honduras   India Indonesia  Kenya
## 1     40     73        52     29       14        9     405       701     58
## 2 267667 238553    108889 245857   214969   112088 3287590   1904569 580367
## 3   1212  15509      9467   5931      800     5265  849638    187765  25905
## 4 Africa Africa  Americas Africa Americas Americas    Asia      Asia Africa
## 5   8.79   8.79      9.31   7.38       12     8.54    5.32     10.67   7.26
##     Laos Liberia   Libya Madagascar Malawi Malaysia    Mali Mauritania   Mexico
```

```
## 1     93      34      13          4     14      140      31          8      243
## 2 236800  111369 1759540     587041 118484   329749 1240192    1025520  1958201
## 3   4262    2705    4712      11493   8556    18333    9507       2036    87836
## 4   Asia  Africa  Africa     Africa Africa     Asia  Africa     Africa Americas
## 5   7.14   10.62    2.43       7.33    5.8    11.92    3.59       0.75     5.84
##   Mozambique Myanmar Namibia  Nepal Nicaragua   Niger Nigeria   Oman   Panama
## 1         36     105      21    102         7      21     427      8       13
## 2     801590  676578  824292 140797    130000 1267000  923768 212457    75517
## 3      16084   42561    1837  19605      3999    7984  112163   1559     2466
## 4     Africa    Asia  Africa   Asia  Americas  Africa  Africa   Asia Americas
## 5       6.07    6.93     2.5   6.39      8.13     2.4       7      0      9.2
##   Papua.New.Guinea Paraguay     Peru Philippines Saudi.Arabia Senegal
## 1              862       21       91         168            8      42
## 2           462840   406752  1285216    3.00E+05      2149690  196722
## 3             3772     4397    21998       62868        14691    7533
## 4          Oceania Americas Americas        Asia         Asia  Africa
## 5            10.88    10.25     2.65       10.34          0.4    3.58
##   Sierra.Leone Solomon.Islands Somalia South.Africa Sri.Lanka   Sudan Suriname
## 1           23              66      14           32         7     134       17
## 2        71740           28896  637657      1221037     65610 2505813   163265
## 3         4260            3301    7691        36070     17240   25941      429
## 4       Africa         Oceania  Africa       Africa      Asia  Africa Americas
## 5         8.22              12       3         6.05      9.59    4.02       12
##   Tanzania Thailand   Togo   UAE Uganda Vanuatu Venezuela Vietnam  Yemen
## 1      131       82     43     9     43     111        40      88      6
## 2   945087   513115  56785 83600 235880   12189    912050  331689 527968
## 3    28359    56293   3643  1629  19517     163     20226   68183  12302
## 4   Africa     Asia Africa  Asia Africa Oceania  Americas    Asia   Asia
## 5     7.02     8.04   7.91  0.83  10.14      12      7.98     8.8      0
##     Zaire Zambia Zimbabwe
## 1     219     38       18
## 2 2344858 752618   390759
## 3   36672   8780    10019
## 4  Africa Africa   Africa
## 5    9.44   5.43     5.29
```

```
langDivWiden <- read.csv("language_diversity_pw.csv")
head(langDivWiden)
```

```
##      Country Continent Measurement Value
## 1    Algeria    Africa       Langs    18
## 2     Angola    Africa       Langs    42
## 3  Australia   Oceania       Langs   234
## 4 Bangladesh      Asia       Langs    37
## 5      Benin    Africa       Langs    52
## 6    Bolivia  Americas       Langs    38
```

Step 2: Lengthen a data set.

Use the pivot_longer() function to lengthen a data set. pivot_longer() takes the arguments data for the data set, cols for the columns whose names are values of a variable, names_to for what to call the new column, and values_to for what to call the column into which the cells of the data frame will be moved.

Note that even though this code lengthens your data set, it still needs additional manipulation before it is tidy.

```
langDiv1 <- pivot_longer(data = langDivLengthen,
                cols = -Measurement,
                names_to = "Country",
                values_to = "Value")
head(langDiv1)
```

```
## # A tibble: 6 x 3
##   Measurement Country    Value
##   <chr>       <chr>      <chr>
## 1 Langs       Algeria    18
## 2 Langs       Angola     42
## 3 Langs       Australia  234
## 4 Langs       Bangladesh 37
## 5 Langs       Benin      52
## 6 Langs       Bolivia    38
```

Step 3: Widen a data set.

Use the pivot_wider() function to widen a data set. pivot_wider() takes the arguments data for the data set, names_from for the column of data that contains the names of the new columns, and values_from for the column of data that contains the values for the new columns.

```
langDiv2 <- pivot_wider(data = langDivWiden,
            names_from = Measurement,
            values_from = Value)

head(langDiv2)
```

```
## # A tibble: 6 x 6
##   Country    Continent Langs    Area Population    GS
##   <chr>      <chr>     <dbl>   <dbl>      <dbl> <dbl>
## 1 Algeria    Africa       18 2381741      25660  6.6
## 2 Angola     Africa       42 1246700      10303  6.22
## 3 Australia  Oceania     234 7713364      17336  6
## 4 Bangladesh Asia         37  143998     118745  7.4
## 5 Benin      Africa       52  112622       4889  7.14
## 6 Bolivia    Americas     38 1098581       7612  6.92
```