Lab 02

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More Basic R Skills

- Create a function `my_reverse` which takes as required input a vector and returns the vector in reverse where the first entry is the last entry, etc. No function calls are allowed inside your function otherwise that would defeat the purpose of the exercise! (Yes, there is a base R function that does this called `rev`). Use `head` on `v` and `tail` on `my_reverse(v)` to verify it works.

```
my_reverse = function(v) {
  v_rev = rep(NA, times=length(v))
  for(i in length(v):1) {
    v_rev[length(v) - i + 1] =v[i]
  }
  v_rev
}
v=1:10
my_reverse(v)
```

```
##  [1] 10  9  8  7  6  5  4  3  2  1
```

- Create a function `flip_matrix` which takes as required input a matrix, an argument `dim_to_rev` that returns the matrix with the rows in reverse order or the columns in reverse order depending on the `dim_to_rev` argument. Let the default be the dimension of the matrix that is greater.

```
flip_matrix = function(X, dim_to_rev = NULL) {
  if (is.null(dim_to_rev)) {
    dim_to_rev = ifelse(nrow(X) >= ncol(X), "rows", "cols")
  }
  if(dim_to_rev == "rows"){
    X[my_reverse(1:nrow(X)), ]
  }else if(dim_to_rev == "cols"){
    X[,my_reverse(1:ncol(X))]
  } else {
    stop("illegal arg")
  }
}
X = matrix(rnorm(100), nrow=25)
X
```

```
##              [,1]        [,2]        [,3]       [,4]
## [1,]  0.10686666  0.24995540 -1.07883895  0.6658617
## [2,] -0.11293098 -0.31763050 -0.09848332 -0.4874751
## [3,]  1.35421102 -0.87046136 -0.08401931  2.0846393
## [4,]  0.98139537 -0.76780990  2.08725856 -0.1126239
## [5,] -1.24655191 -0.11663071 -0.48824414 -0.0791829
```

```
##  [6,]   0.41933474  0.14642699   0.79686719 -0.7406741
##  [7,]  -2.45223787 -0.16203773   0.44748174 -0.4155154
##  [8,]  -0.79172454  0.80591469   1.71035637  1.4541068
##  [9,]  -0.11180065  1.62220953   0.99644608  0.7651144
## [10,]   0.33556231 -0.87507480  -2.30351891  0.5621264
## [11,]   1.12420024 -0.58633516  -0.18858007 -0.3964535
## [12,]  -1.61975313 -0.31612086   0.01058625  1.0111729
## [13,]  -0.09475405  0.87314217   2.04862071  0.3013537
## [14,]  -0.10732890  0.59412267  -0.41795588  0.2061075
## [15,]  -0.92069500 -1.50238702  -0.57033464 -2.3145764
## [16,]  -0.14438197  0.43499678   0.61348935 -1.2527477
## [17,]  -0.82309803 -0.12543519  -0.65280795  0.4575710
## [18,]  -0.04386203  0.59514178  -1.43237025 -1.0393276
## [19,]  -1.24288489 -1.61567701   0.81570562  0.4449905
## [20,]   0.82176428 -1.06577882  -1.46110079 -1.6155332
## [21,]  -0.26032366  1.05586223   1.62980124  0.7350615
## [22,]  -0.24871324 -0.82310914  -2.77656137  0.6202506
## [23,]   0.98679845  0.08676918  -0.50442825 -0.2347459
## [24,]   0.15662656 -1.66918844  -0.89020254 -0.1601303
## [25,]   0.01911522 -1.21543636   1.07934912 -1.2214007
```

```
flip_matrix(X, dim_to_rev = "cols")
```

```
##               [,1]        [,2]         [,3]         [,4]
##  [1,]   0.6658617 -1.07883895   0.24995540  0.10686666
##  [2,]  -0.4874751 -0.09848332  -0.31763050 -0.11293098
##  [3,]   2.0846393 -0.08401931  -0.87046136  1.35421102
##  [4,]  -0.1126239  2.08725856  -0.76780990  0.98139537
##  [5,]  -0.0791829 -0.48824414  -0.11663071 -1.24655191
##  [6,]  -0.7406741  0.79686719   0.14642699  0.41933474
##  [7,]  -0.4155154  0.44748174  -0.16203773 -2.45223787
##  [8,]   1.4541068  1.71035637   0.80591469 -0.79172454
##  [9,]   0.7651144  0.99644608   1.62220953 -0.11180065
## [10,]   0.5621264 -2.30351891  -0.87507480  0.33556231
## [11,]  -0.3964535 -0.18858007  -0.58633516  1.12420024
## [12,]   1.0111729  0.01058625  -0.31612086 -1.61975313
## [13,]   0.3013537  2.04862071   0.87314217 -0.09475405
## [14,]   0.2061075 -0.41795588   0.59412267 -0.10732890
## [15,]  -2.3145764 -0.57033464  -1.50238702 -0.92069500
## [16,]  -1.2527477  0.61348935   0.43499678 -0.14438197
## [17,]   0.4575710 -0.65280795  -0.12543519 -0.82309803
## [18,]  -1.0393276 -1.43237025   0.59514178 -0.04386203
## [19,]   0.4449905  0.81570562  -1.61567701 -1.24288489
## [20,]  -1.6155332 -1.46110079  -1.06577882  0.82176428
## [21,]   0.7350615  1.62980124   1.05586223 -0.26032366
## [22,]   0.6202506 -2.77656137  -0.82310914 -0.24871324
## [23,]  -0.2347459 -0.50442825   0.08676918  0.98679845
## [24,]  -0.1601303 -0.89020254  -1.66918844  0.15662656
## [25,]  -1.2214007  1.07934912  -1.21543636  0.01911522
```

- Create a list named `my_list` with keys "A", "B", … where the entries are arrays of size 1, 2 x 2, 3 x 3 x 3, etc. Fill the array with the numbers 1, 2, 3, etc. Make 8 entries according to this sequence.

```
arrays = list()
LETTERS
```

```
##  [1] "A" "B" "C" "D" "E" "F" "G" "H" "I" "J" "K" "L" "M" "N" "O" "P" "Q" "R" "S"
## [20] "T" "U" "V" "W" "X" "Y" "Z"
```

```
arrays[["A"]] = array(data=1:1, dim=c(1))
arrays[["B"]] = array(data=1:4, dim=c(2,2))
arrays[["C"]] = array(data=1:27, dim=c(3,3,3))
arrays[["D"]] = array(data=1:64, dim=c(4,4,4,4))
arrays[["E"]] = array(data=1:3125, dim=c(5,5,5,5,5))
arrays[["F"]] = array(data=1:46656, dim=c(6,6,6,6,6,6))
arrays[["G"]] = array(data=1:823543, dim=c(7,7,7,7,7,7,7))
arrays[["H"]] = array(data=1:16777216, dim=c(8,8,8,8,8,8,8,8))
# arrays
```

Run the following code:

```
lapply(arrays, object.size)
```

```
## $A
## 224 bytes
##
## $B
## 232 bytes
##
## $C
## 352 bytes
##
## $D
## 1248 bytes
##
## $E
## 12744 bytes
##
## $F
## 186864 bytes
##
## $G
## 3294416 bytes
##
## $H
## 67109104 bytes
```

Use `?object.size` to read about what these functions do. Then explain the output you see above. For the later arrays, does it make sense given the dimensions of the arrays? ?object.size

the object.size provides an estimate of the memeory that is being used to store an R object. This makes sense that the amount of memory would increase dramatically as the dimensions of the arraays increases starting from 1 to an 8x8x8x8x8x8x8x8.

Now cleanup the namespace by deleting all stored objects and functions:

```
rm(list = ls())
```

A little about strings

- Use the `strsplit` function and `sample` to put the sentences in the string `lorem` below in random order. You will also need to manipulate the output of `strsplit` which is a list. You may need to learn basic concepts of regular expressions.

```
lorem = "Lorem ipsum dolor sit amet, consectetur adipiscing elit. Morbi posuere varius volutpat. Morbi
sample(unlist(strsplit(lorem,"\\.")))
```

```
##  [1] " Morbi faucibus ligula id massa ultricies viverra"
##  [2] " Integer dapibus mi lectus, eu posuere arcu ultricies in"
##  [3] " Aenean nulla ante, iaculis sed vehicula ac, finibus vel arcu"
##  [4] " Donec vehicula sagittis nisi non semper"
##  [5] " "
##  [6] "Lorem ipsum dolor sit amet, consectetur adipiscing elit"
##  [7] " Donec at tempor erat"
##  [8] " Curabitur est augue, congue eget quam in, scelerisque semper magna"
##  [9] " Morbi posuere varius volutpat"
## [10] " Cras suscipit id nibh lacinia elementum"
## [11] " Mauris at sodales augue"
```

You have a set of names divided by gender (M / F) and generation (Boomer / GenX / Millenial):

- M / Boomer "Theodore, Bernard, Gene, Herbert, Ray, Tom, Lee, Alfred, Leroy, Eddie"
- M / GenX "Marc, Jamie, Greg, Darryl, Tim, Dean, Jon, Chris, Troy, Jeff"
- M / Millennial "Zachary, Dylan, Christian, Wesley, Seth, Austin, Gabriel, Evan, Casey, Luis"
- F / Boomer "Gloria, Joan, Dorothy, Shirley, Betty, Dianne, Kay, Marjorie, Lorraine, Mildred"
- F / GenX "Tracy, Dawn, Tina, Tammy, Melinda, Tamara, Tracey, Colleen, Sherri, Heidi"
- F / Millennial "Samantha, Alexis, Brittany, Lauren, Taylor, Bethany, Latoya, Candice, Brittney, Cheyenne"

Create a list-within-a-list that will intelligently store this data.

```
set <- list("M" = list(), "F" = list())
set$M$Boomer = strsplit("Theodore, Bernard, Gene, Herbert, Ray, Tom, Lee, Alfred, Leroy, Eddie", split =
set$M$GenX = strsplit("Marc, Jamie, Greg, Darryl, Tim, Dean, Jon, Chris, Troy, Jeff", split = ", ")[[1]]
set$M$Millennial = strsplit("Zachary, Dylan, Christian, Wesley, Seth, Austin, Gabriel, Evan, Casey, Luis
set$F$Boomer = strsplit("Gloria, Joan, Dorothy, Shirley, Betty, Dianne, Kay, Marjorie, Lorraine, Mildred
set$F$GenX = strsplit("Tracy, Dawn, Tina, Tammy, Melinda, Tamara, Tracey, Colleen, Sherri, Heidi", spli
set$F$Millennial = strsplit("Samantha, Alexis, Brittany, Lauren, Taylor, Bethany, Latoya, Candice, Britt
set
```

```
## $M
## $M$Boomer
##  [1] "Theodore" "Bernard"  "Gene"     "Herbert"  "Ray"      "Tom"
##  [7] "Lee"      "Alfred"   "Leroy"    "Eddie"
##
## $M$GenX
##  [1] "Marc"   "Jamie"  "Greg"   "Darryl" "Tim"    "Dean"   "Jon"    "Chris"
##  [9] "Troy"   "Jeff"
##
## $M$Millennial
##  [1] "Zachary"   "Dylan"     "Christian" "Wesley"    "Seth"      "Austin"
##  [7] "Gabriel"   "Evan"      "Casey"     "Luis"
##
##
## $F
## $F$Boomer
##  [1] "Gloria"   "Joan"     "Dorothy"  "Shirley"  "Betty"    "Dianne"
##  [7] "Kay"      "Marjorie" "Lorraine" "Mildred"
##
## $F$GenX
```

```
## [1] "Tracy"   "Dawn"    "Tina"    "Tammy"   "Melinda" "Tamara"  "Tracey"
## [8] "Colleen" "Sherri"  "Heidi"
##
## $F$Millennial
## [1] "Samantha" "Alexis"   "Brittany" "Lauren"   "Taylor"   "Bethany"
## [7] "Latoya"   "Candice"  "Brittney" "Cheyenne"
```

Dataframe creation

Imagine you are running an experiment with many manipulations. You have 14 levels in the variable "treatment" with levels a, b, c, etc. For each of those manipulations you have 3 submanipulations in a variable named "variation" with levels A, B, C. Then you have "gender" with levels M / F. Then you have "generation" with levels Boomer, GenX, Millenial. Then you will have 6 runs per each of these groups. In each set of 6 you will need to select a name without duplication from the appropriate set of names (from the last question). Create a data frame with columns treatment, variation, gender, generation, name and y that will store all the unique unit information in this experiment. Leave y empty because it will be measured as the experiment is executed.

```
n = 14 * 3 * 2 * 3 * 10
X = data.frame(treatment = rep(NA,n), variation = rep(NA,n), gender = rep(NA,n),
               generation = rep(NA,n), name= rep(NA,n), y = rep(NA,n))
X$treatment = rep(letters[1:14], each = n/14)
X$variation = rep(rep(LETTERS[1:3], each = n/14/3) , times = 14)
X$gender = rep(rep(c("M", "F"), each = n/14/3/2), times = 14*3)
X$generation = rep(rep(c("Boomer", "GenX", "Millenial"), each = n/14/3/2/3), times = 14 * 3 * 2)
X$name = rep(unlist(set), times = 14 * 3)
X
```

```
##    treatment variation gender generation      name  y
## 1          a         A      M     Boomer  Theodore NA
## 2          a         A      M     Boomer   Bernard NA
## 3          a         A      M     Boomer      Gene NA
## 4          a         A      M     Boomer   Herbert NA
## 5          a         A      M     Boomer       Ray NA
## 6          a         A      M     Boomer       Tom NA
## 7          a         A      M     Boomer       Lee NA
## 8          a         A      M     Boomer    Alfred NA
## 9          a         A      M     Boomer     Leroy NA
## 10         a         A      M     Boomer     Eddie NA
## 11         a         A      M       GenX      Marc NA
## 12         a         A      M       GenX     Jamie NA
## 13         a         A      M       GenX      Greg NA
## 14         a         A      M       GenX    Darryl NA
## 15         a         A      M       GenX       Tim NA
## 16         a         A      M       GenX      Dean NA
## 17         a         A      M       GenX       Jon NA
## 18         a         A      M       GenX     Chris NA
## 19         a         A      M       GenX      Troy NA
## 20         a         A      M       GenX      Jeff NA
## 21         a         A      M  Millenial   Zachary NA
## 22         a         A      M  Millenial     Dylan NA
## 23         a         A      M  Millenial Christian NA
## 24         a         A      M  Millenial    Wesley NA
## 25         a         A      M  Millenial      Seth NA
## 26         a         A      M  Millenial    Austin NA
```

```
## 27          a          A          M   Millenial     Gabriel NA
## 28          a          A          M   Millenial        Evan NA
## 29          a          A          M   Millenial       Casey NA
## 30          a          A          M   Millenial        Luis NA
## 31          a          A          F      Boomer      Gloria NA
## 32          a          A          F      Boomer        Joan NA
## 33          a          A          F      Boomer     Dorothy NA
## 34          a          A          F      Boomer     Shirley NA
## 35          a          A          F      Boomer       Betty NA
## 36          a          A          F      Boomer      Dianne NA
## 37          a          A          F      Boomer         Kay NA
## 38          a          A          F      Boomer     Marjorie NA
## 39          a          A          F      Boomer     Lorraine NA
## 40          a          A          F      Boomer     Mildred NA
## 41          a          A          F        GenX       Tracy NA
## 42          a          A          F        GenX        Dawn NA
## 43          a          A          F        GenX        Tina NA
## 44          a          A          F        GenX       Tammy NA
## 45          a          A          F        GenX     Melinda NA
## 46          a          A          F        GenX      Tamara NA
## 47          a          A          F        GenX      Tracey NA
## 48          a          A          F        GenX     Colleen NA
## 49          a          A          F        GenX       Sherri NA
## 50          a          A          F        GenX       Heidi NA
## 51          a          A          F   Millenial    Samantha NA
## 52          a          A          F   Millenial      Alexis NA
## 53          a          A          F   Millenial     Brittany NA
## 54          a          A          F   Millenial      Lauren NA
## 55          a          A          F   Millenial       Taylor NA
## 56          a          A          F   Millenial     Bethany NA
## 57          a          A          F   Millenial      Latoya NA
## 58          a          A          F   Millenial      Candice NA
## 59          a          A          F   Millenial     Brittney NA
## 60          a          A          F   Millenial     Cheyenne NA
## 61          a          B          M      Boomer     Theodore NA
## 62          a          B          M      Boomer      Bernard NA
## 63          a          B          M      Boomer        Gene NA
## 64          a          B          M      Boomer     Herbert NA
## 65          a          B          M      Boomer         Ray NA
## 66          a          B          M      Boomer         Tom NA
## 67          a          B          M      Boomer         Lee NA
## 68          a          B          M      Boomer      Alfred NA
## 69          a          B          M      Boomer       Leroy NA
## 70          a          B          M      Boomer       Eddie NA
## 71          a          B          M        GenX        Marc NA
## 72          a          B          M        GenX       Jamie NA
## 73          a          B          M        GenX        Greg NA
## 74          a          B          M        GenX      Darryl NA
## 75          a          B          M        GenX         Tim NA
## 76          a          B          M        GenX        Dean NA
## 77          a          B          M        GenX         Jon NA
## 78          a          B          M        GenX       Chris NA
## 79          a          B          M        GenX        Troy NA
## 80          a          B          M        GenX        Jeff NA
```

```
## 81           a           B           M    Millenial    Zachary NA
## 82           a           B           M    Millenial      Dylan NA
## 83           a           B           M    Millenial  Christian NA
## 84           a           B           M    Millenial     Wesley NA
## 85           a           B           M    Millenial       Seth NA
## 86           a           B           M    Millenial     Austin NA
## 87           a           B           M    Millenial     Gabriel NA
## 88           a           B           M    Millenial       Evan NA
## 89           a           B           M    Millenial      Casey NA
## 90           a           B           M    Millenial       Luis NA
## 91           a           B           F      Boomer     Gloria NA
## 92           a           B           F      Boomer       Joan NA
## 93           a           B           F      Boomer     Dorothy NA
## 94           a           B           F      Boomer     Shirley NA
## 95           a           B           F      Boomer      Betty NA
## 96           a           B           F      Boomer     Dianne NA
## 97           a           B           F      Boomer        Kay NA
## 98           a           B           F      Boomer    Marjorie NA
## 99           a           B           F      Boomer     Lorraine NA
## 100          a           B           F      Boomer     Mildred NA
## 101          a           B           F        GenX      Tracy NA
## 102          a           B           F        GenX       Dawn NA
## 103          a           B           F        GenX       Tina NA
## 104          a           B           F        GenX      Tammy NA
## 105          a           B           F        GenX    Melinda NA
## 106          a           B           F        GenX     Tamara NA
## 107          a           B           F        GenX     Tracey NA
## 108          a           B           F        GenX    Colleen NA
## 109          a           B           F        GenX     Sherri NA
## 110          a           B           F        GenX      Heidi NA
## 111          a           B           F    Millenial   Samantha NA
## 112          a           B           F    Millenial     Alexis NA
## 113          a           B           F    Millenial    Brittany NA
## 114          a           B           F    Millenial     Lauren NA
## 115          a           B           F    Millenial     Taylor NA
## 116          a           B           F    Millenial    Bethany NA
## 117          a           B           F    Millenial     Latoya NA
## 118          a           B           F    Millenial    Candice NA
## 119          a           B           F    Millenial    Brittney NA
## 120          a           B           F    Millenial    Cheyenne NA
## 121          a           C           M      Boomer    Theodore NA
## 122          a           C           M      Boomer     Bernard NA
## 123          a           C           M      Boomer       Gene NA
## 124          a           C           M      Boomer     Herbert NA
## 125          a           C           M      Boomer        Ray NA
## 126          a           C           M      Boomer        Tom NA
## 127          a           C           M      Boomer        Lee NA
## 128          a           C           M      Boomer     Alfred NA
## 129          a           C           M      Boomer      Leroy NA
## 130          a           C           M      Boomer      Eddie NA
## 131          a           C           M        GenX       Marc NA
## 132          a           C           M        GenX      Jamie NA
## 133          a           C           M        GenX       Greg NA
## 134          a           C           M        GenX     Darryl NA
```

```
## 135         a          C          M        GenX        Tim NA
## 136         a          C          M        GenX       Dean NA
## 137         a          C          M        GenX        Jon NA
## 138         a          C          M        GenX      Chris NA
## 139         a          C          M        GenX       Troy NA
## 140         a          C          M        GenX       Jeff NA
## 141         a          C          M   Millenial    Zachary NA
## 142         a          C          M   Millenial      Dylan NA
## 143         a          C          M   Millenial  Christian NA
## 144         a          C          M   Millenial     Wesley NA
## 145         a          C          M   Millenial       Seth NA
## 146         a          C          M   Millenial     Austin NA
## 147         a          C          M   Millenial    Gabriel NA
## 148         a          C          M   Millenial       Evan NA
## 149         a          C          M   Millenial      Casey NA
## 150         a          C          M   Millenial       Luis NA
## 151         a          C          F      Boomer     Gloria NA
## 152         a          C          F      Boomer       Joan NA
## 153         a          C          F      Boomer    Dorothy NA
## 154         a          C          F      Boomer    Shirley NA
## 155         a          C          F      Boomer      Betty NA
## 156         a          C          F      Boomer     Dianne NA
## 157         a          C          F      Boomer        Kay NA
## 158         a          C          F      Boomer   Marjorie NA
## 159         a          C          F      Boomer   Lorraine NA
## 160         a          C          F      Boomer    Mildred NA
## 161         a          C          F        GenX      Tracy NA
## 162         a          C          F        GenX       Dawn NA
## 163         a          C          F        GenX       Tina NA
## 164         a          C          F        GenX      Tammy NA
## 165         a          C          F        GenX    Melinda NA
## 166         a          C          F        GenX     Tamara NA
## 167         a          C          F        GenX     Tracey NA
## 168         a          C          F        GenX    Colleen NA
## 169         a          C          F        GenX     Sherri NA
## 170         a          C          F        GenX      Heidi NA
## 171         a          C          F   Millenial   Samantha NA
## 172         a          C          F   Millenial     Alexis NA
## 173         a          C          F   Millenial    Brittany NA
## 174         a          C          F   Millenial     Lauren NA
## 175         a          C          F   Millenial     Taylor NA
## 176         a          C          F   Millenial    Bethany NA
## 177         a          C          F   Millenial     Latoya NA
## 178         a          C          F   Millenial    Candice NA
## 179         a          C          F   Millenial    Brittney NA
## 180         a          C          F   Millenial   Cheyenne NA
## 181         b          A          M      Boomer   Theodore NA
## 182         b          A          M      Boomer    Bernard NA
## 183         b          A          M      Boomer       Gene NA
## 184         b          A          M      Boomer    Herbert NA
## 185         b          A          M      Boomer        Ray NA
## 186         b          A          M      Boomer        Tom NA
## 187         b          A          M      Boomer        Lee NA
## 188         b          A          M      Boomer     Alfred NA
```

```
## 189           b           A           M       Boomer        Leroy NA
## 190           b           A           M       Boomer        Eddie NA
## 191           b           A           M         GenX         Marc NA
## 192           b           A           M         GenX        Jamie NA
## 193           b           A           M         GenX         Greg NA
## 194           b           A           M         GenX       Darryl NA
## 195           b           A           M         GenX          Tim NA
## 196           b           A           M         GenX         Dean NA
## 197           b           A           M         GenX          Jon NA
## 198           b           A           M         GenX        Chris NA
## 199           b           A           M         GenX         Troy NA
## 200           b           A           M         GenX         Jeff NA
## 201           b           A           M    Millenial     Zachary NA
## 202           b           A           M    Millenial       Dylan NA
## 203           b           A           M    Millenial   Christian NA
## 204           b           A           M    Millenial      Wesley NA
## 205           b           A           M    Millenial        Seth NA
## 206           b           A           M    Millenial      Austin NA
## 207           b           A           M    Millenial     Gabriel NA
## 208           b           A           M    Millenial        Evan NA
## 209           b           A           M    Millenial       Casey NA
## 210           b           A           M    Millenial        Luis NA
## 211           b           A           F       Boomer       Gloria NA
## 212           b           A           F       Boomer         Joan NA
## 213           b           A           F       Boomer      Dorothy NA
## 214           b           A           F       Boomer      Shirley NA
## 215           b           A           F       Boomer        Betty NA
## 216           b           A           F       Boomer       Dianne NA
## 217           b           A           F       Boomer          Kay NA
## 218           b           A           F       Boomer     Marjorie NA
## 219           b           A           F       Boomer     Lorraine NA
## 220           b           A           F       Boomer      Mildred NA
## 221           b           A           F         GenX        Tracy NA
## 222           b           A           F         GenX         Dawn NA
## 223           b           A           F         GenX         Tina NA
## 224           b           A           F         GenX        Tammy NA
## 225           b           A           F         GenX      Melinda NA
## 226           b           A           F         GenX       Tamara NA
## 227           b           A           F         GenX       Tracey NA
## 228           b           A           F         GenX      Colleen NA
## 229           b           A           F         GenX       Sherri NA
## 230           b           A           F         GenX        Heidi NA
## 231           b           A           F    Millenial    Samantha NA
## 232           b           A           F    Millenial       Alexis NA
## 233           b           A           F    Millenial     Brittany NA
## 234           b           A           F    Millenial       Lauren NA
## 235           b           A           F    Millenial       Taylor NA
## 236           b           A           F    Millenial      Bethany NA
## 237           b           A           F    Millenial       Latoya NA
## 238           b           A           F    Millenial      Candice NA
## 239           b           A           F    Millenial     Brittney NA
## 240           b           A           F    Millenial     Cheyenne NA
## 241           b           B           M       Boomer     Theodore NA
## 242           b           B           M       Boomer      Bernard NA
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## 243            b            B            M        Boomer       Gene NA
## 244            b            B            M        Boomer    Herbert NA
## 245            b            B            M        Boomer        Ray NA
## 246            b            B            M        Boomer        Tom NA
## 247            b            B            M        Boomer        Lee NA
## 248            b            B            M        Boomer     Alfred NA
## 249            b            B            M        Boomer      Leroy NA
## 250            b            B            M        Boomer      Eddie NA
## 251            b            B            M          GenX       Marc NA
## 252            b            B            M          GenX      Jamie NA
## 253            b            B            M          GenX       Greg NA
## 254            b            B            M          GenX     Darryl NA
## 255            b            B            M          GenX        Tim NA
## 256            b            B            M          GenX       Dean NA
## 257            b            B            M          GenX        Jon NA
## 258            b            B            M          GenX      Chris NA
## 259            b            B            M          GenX       Troy NA
## 260            b            B            M          GenX       Jeff NA
## 261            b            B            M     Millenial    Zachary NA
## 262            b            B            M     Millenial      Dylan NA
## 263            b            B            M     Millenial  Christian NA
## 264            b            B            M     Millenial     Wesley NA
## 265            b            B            M     Millenial       Seth NA
## 266            b            B            M     Millenial     Austin NA
## 267            b            B            M     Millenial    Gabriel NA
## 268            b            B            M     Millenial       Evan NA
## 269            b            B            M     Millenial      Casey NA
## 270            b            B            M     Millenial       Luis NA
## 271            b            B            F        Boomer     Gloria NA
## 272            b            B            F        Boomer       Joan NA
## 273            b            B            F        Boomer    Dorothy NA
## 274            b            B            F        Boomer    Shirley NA
## 275            b            B            F        Boomer      Betty NA
## 276            b            B            F        Boomer     Dianne NA
## 277            b            B            F        Boomer        Kay NA
## 278            b            B            F        Boomer   Marjorie NA
## 279            b            B            F        Boomer   Lorraine NA
## 280            b            B            F        Boomer    Mildred NA
## 281            b            B            F          GenX      Tracy NA
## 282            b            B            F          GenX       Dawn NA
## 283            b            B            F          GenX       Tina NA
## 284            b            B            F          GenX      Tammy NA
## 285            b            B            F          GenX    Melinda NA
## 286            b            B            F          GenX     Tamara NA
## 287            b            B            F          GenX     Tracey NA
## 288            b            B            F          GenX    Colleen NA
## 289            b            B            F          GenX     Sherri NA
## 290            b            B            F          GenX      Heidi NA
## 291            b            B            F     Millenial   Samantha NA
## 292            b            B            F     Millenial     Alexis NA
## 293            b            B            F     Millenial    Brittany NA
## 294            b            B            F     Millenial     Lauren NA
## 295            b            B            F     Millenial     Taylor NA
## 296            b            B            F     Millenial    Bethany NA
```

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## 297            b          B       F    Millenial    Latoya NA
## 298            b          B       F    Millenial   Candice NA
## 299            b          B       F    Millenial  Brittney NA
## 300            b          B       F    Millenial  Cheyenne NA
## 301            b          C       M       Boomer  Theodore NA
## 302            b          C       M       Boomer   Bernard NA
## 303            b          C       M       Boomer      Gene NA
## 304            b          C       M       Boomer   Herbert NA
## 305            b          C       M       Boomer       Ray NA
## 306            b          C       M       Boomer       Tom NA
## 307            b          C       M       Boomer       Lee NA
## 308            b          C       M       Boomer    Alfred NA
## 309            b          C       M       Boomer     Leroy NA
## 310            b          C       M       Boomer     Eddie NA
## 311            b          C       M         GenX      Marc NA
## 312            b          C       M         GenX     Jamie NA
## 313            b          C       M         GenX      Greg NA
## 314            b          C       M         GenX    Darryl NA
## 315            b          C       M         GenX       Tim NA
## 316            b          C       M         GenX      Dean NA
## 317            b          C       M         GenX       Jon NA
## 318            b          C       M         GenX     Chris NA
## 319            b          C       M         GenX      Troy NA
## 320            b          C       M         GenX      Jeff NA
## 321            b          C       M    Millenial   Zachary NA
## 322            b          C       M    Millenial     Dylan NA
## 323            b          C       M    Millenial Christian NA
## 324            b          C       M    Millenial    Wesley NA
## 325            b          C       M    Millenial      Seth NA
## 326            b          C       M    Millenial    Austin NA
## 327            b          C       M    Millenial   Gabriel NA
## 328            b          C       M    Millenial      Evan NA
## 329            b          C       M    Millenial     Casey NA
## 330            b          C       M    Millenial      Luis NA
## 331            b          C       F       Boomer    Gloria NA
## 332            b          C       F       Boomer      Joan NA
## 333            b          C       F       Boomer   Dorothy NA
## 334            b          C       F       Boomer   Shirley NA
## 335            b          C       F       Boomer     Betty NA
## 336            b          C       F       Boomer    Dianne NA
## 337            b          C       F       Boomer       Kay NA
## 338            b          C       F       Boomer  Marjorie NA
## 339            b          C       F       Boomer  Lorraine NA
## 340            b          C       F       Boomer   Mildred NA
## 341            b          C       F         GenX     Tracy NA
## 342            b          C       F         GenX      Dawn NA
## 343            b          C       F         GenX      Tina NA
## 344            b          C       F         GenX     Tammy NA
## 345            b          C       F         GenX   Melinda NA
## 346            b          C       F         GenX    Tamara NA
## 347            b          C       F         GenX    Tracey NA
## 348            b          C       F         GenX   Colleen NA
## 349            b          C       F         GenX    Sherri NA
## 350            b          C       F         GenX      Heidi NA
```

```
## 351            b          C        F    Millenial    Samantha NA
## 352            b          C        F    Millenial      Alexis NA
## 353            b          C        F    Millenial    Brittany NA
## 354            b          C        F    Millenial      Lauren NA
## 355            b          C        F    Millenial      Taylor NA
## 356            b          C        F    Millenial     Bethany NA
## 357            b          C        F    Millenial      Latoya NA
## 358            b          C        F    Millenial     Candice NA
## 359            b          C        F    Millenial    Brittney NA
## 360            b          C        F    Millenial    Cheyenne NA
## 361            c          A        M      Boomer     Theodore NA
## 362            c          A        M      Boomer      Bernard NA
## 363            c          A        M      Boomer         Gene NA
## 364            c          A        M      Boomer      Herbert NA
## 365            c          A        M      Boomer          Ray NA
## 366            c          A        M      Boomer          Tom NA
## 367            c          A        M      Boomer          Lee NA
## 368            c          A        M      Boomer       Alfred NA
## 369            c          A        M      Boomer        Leroy NA
## 370            c          A        M      Boomer        Eddie NA
## 371            c          A        M        GenX         Marc NA
## 372            c          A        M        GenX        Jamie NA
## 373            c          A        M        GenX         Greg NA
## 374            c          A        M        GenX       Darryl NA
## 375            c          A        M        GenX          Tim NA
## 376            c          A        M        GenX         Dean NA
## 377            c          A        M        GenX          Jon NA
## 378            c          A        M        GenX        Chris NA
## 379            c          A        M        GenX         Troy NA
## 380            c          A        M        GenX         Jeff NA
## 381            c          A        M    Millenial     Zachary NA
## 382            c          A        M    Millenial       Dylan NA
## 383            c          A        M    Millenial   Christian NA
## 384            c          A        M    Millenial      Wesley NA
## 385            c          A        M    Millenial        Seth NA
## 386            c          A        M    Millenial      Austin NA
## 387            c          A        M    Millenial     Gabriel NA
## 388            c          A        M    Millenial        Evan NA
## 389            c          A        M    Millenial       Casey NA
## 390            c          A        M    Millenial        Luis NA
## 391            c          A        F      Boomer       Gloria NA
## 392            c          A        F      Boomer         Joan NA
## 393            c          A        F      Boomer      Dorothy NA
## 394            c          A        F      Boomer      Shirley NA
## 395            c          A        F      Boomer        Betty NA
## 396            c          A        F      Boomer       Dianne NA
## 397            c          A        F      Boomer          Kay NA
## 398            c          A        F      Boomer     Marjorie NA
## 399            c          A        F      Boomer      Lorraine NA
## 400            c          A        F      Boomer      Mildred NA
## 401            c          A        F        GenX        Tracy NA
## 402            c          A        F        GenX         Dawn NA
## 403            c          A        F        GenX         Tina NA
## 404            c          A        F        GenX        Tammy NA
```

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## 405          c          A          F          GenX      Melinda NA
## 406          c          A          F          GenX       Tamara NA
## 407          c          A          F          GenX       Tracey NA
## 408          c          A          F          GenX      Colleen NA
## 409          c          A          F          GenX       Sherri NA
## 410          c          A          F          GenX        Heidi NA
## 411          c          A          F     Millenial     Samantha NA
## 412          c          A          F     Millenial       Alexis NA
## 413          c          A          F     Millenial     Brittany NA
## 414          c          A          F     Millenial       Lauren NA
## 415          c          A          F     Millenial       Taylor NA
## 416          c          A          F     Millenial      Bethany NA
## 417          c          A          F     Millenial       Latoya NA
## 418          c          A          F     Millenial      Candice NA
## 419          c          A          F     Millenial     Brittney NA
## 420          c          A          F     Millenial     Cheyenne NA
## 421          c          B          M        Boomer     Theodore NA
## 422          c          B          M        Boomer      Bernard NA
## 423          c          B          M        Boomer         Gene NA
## 424          c          B          M        Boomer      Herbert NA
## 425          c          B          M        Boomer          Ray NA
## 426          c          B          M        Boomer          Tom NA
## 427          c          B          M        Boomer          Lee NA
## 428          c          B          M        Boomer       Alfred NA
## 429          c          B          M        Boomer        Leroy NA
## 430          c          B          M        Boomer        Eddie NA
## 431          c          B          M          GenX         Marc NA
## 432          c          B          M          GenX        Jamie NA
## 433          c          B          M          GenX         Greg NA
## 434          c          B          M          GenX       Darryl NA
## 435          c          B          M          GenX          Tim NA
## 436          c          B          M          GenX         Dean NA
## 437          c          B          M          GenX          Jon NA
## 438          c          B          M          GenX        Chris NA
## 439          c          B          M          GenX         Troy NA
## 440          c          B          M          GenX         Jeff NA
## 441          c          B          M     Millenial      Zachary NA
## 442          c          B          M     Millenial        Dylan NA
## 443          c          B          M     Millenial    Christian NA
## 444          c          B          M     Millenial       Wesley NA
## 445          c          B          M     Millenial         Seth NA
## 446          c          B          M     Millenial       Austin NA
## 447          c          B          M     Millenial       Gabriel NA
## 448          c          B          M     Millenial         Evan NA
## 449          c          B          M     Millenial        Casey NA
## 450          c          B          M     Millenial         Luis NA
## 451          c          B          F        Boomer       Gloria NA
## 452          c          B          F        Boomer         Joan NA
## 453          c          B          F        Boomer      Dorothy NA
## 454          c          B          F        Boomer      Shirley NA
## 455          c          B          F        Boomer        Betty NA
## 456          c          B          F        Boomer       Dianne NA
## 457          c          B          F        Boomer          Kay NA
## 458          c          B          F        Boomer      Marjorie NA
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## 459            c         B         F       Boomer   Lorraine NA
## 460            c         B         F       Boomer    Mildred NA
## 461            c         B         F         GenX      Tracy NA
## 462            c         B         F         GenX       Dawn NA
## 463            c         B         F         GenX       Tina NA
## 464            c         B         F         GenX      Tammy NA
## 465            c         B         F         GenX    Melinda NA
## 466            c         B         F         GenX     Tamara NA
## 467            c         B         F         GenX     Tracey NA
## 468            c         B         F         GenX    Colleen NA
## 469            c         B         F         GenX     Sherri NA
## 470            c         B         F         GenX      Heidi NA
## 471            c         B         F    Millenial   Samantha NA
## 472            c         B         F    Millenial     Alexis NA
## 473            c         B         F    Millenial   Brittany NA
## 474            c         B         F    Millenial     Lauren NA
## 475            c         B         F    Millenial     Taylor NA
## 476            c         B         F    Millenial    Bethany NA
## 477            c         B         F    Millenial     Latoya NA
## 478            c         B         F    Millenial    Candice NA
## 479            c         B         F    Millenial    Brittney NA
## 480            c         B         F    Millenial   Cheyenne NA
## 481            c         C         M       Boomer   Theodore NA
## 482            c         C         M       Boomer    Bernard NA
## 483            c         C         M       Boomer       Gene NA
## 484            c         C         M       Boomer    Herbert NA
## 485            c         C         M       Boomer        Ray NA
## 486            c         C         M       Boomer        Tom NA
## 487            c         C         M       Boomer        Lee NA
## 488            c         C         M       Boomer     Alfred NA
## 489            c         C         M       Boomer      Leroy NA
## 490            c         C         M       Boomer      Eddie NA
## 491            c         C         M         GenX       Marc NA
## 492            c         C         M         GenX      Jamie NA
## 493            c         C         M         GenX       Greg NA
## 494            c         C         M         GenX     Darryl NA
## 495            c         C         M         GenX        Tim NA
## 496            c         C         M         GenX       Dean NA
## 497            c         C         M         GenX        Jon NA
## 498            c         C         M         GenX      Chris NA
## 499            c         C         M         GenX       Troy NA
## 500            c         C         M         GenX       Jeff NA
## 501            c         C         M    Millenial    Zachary NA
## 502            c         C         M    Millenial      Dylan NA
## 503            c         C         M    Millenial  Christian NA
## 504            c         C         M    Millenial     Wesley NA
## 505            c         C         M    Millenial       Seth NA
## 506            c         C         M    Millenial     Austin NA
## 507            c         C         M    Millenial    Gabriel NA
## 508            c         C         M    Millenial       Evan NA
## 509            c         C         M    Millenial      Casey NA
## 510            c         C         M    Millenial       Luis NA
## 511            c         C         F       Boomer     Gloria NA
## 512            c         C         F       Boomer       Joan NA
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## 513          c          C          F       Boomer    Dorothy NA
## 514          c          C          F       Boomer    Shirley NA
## 515          c          C          F       Boomer      Betty NA
## 516          c          C          F       Boomer     Dianne NA
## 517          c          C          F       Boomer        Kay NA
## 518          c          C          F       Boomer    Marjorie NA
## 519          c          C          F       Boomer    Lorraine NA
## 520          c          C          F       Boomer     Mildred NA
## 521          c          C          F         GenX      Tracy NA
## 522          c          C          F         GenX       Dawn NA
## 523          c          C          F         GenX       Tina NA
## 524          c          C          F         GenX      Tammy NA
## 525          c          C          F         GenX    Melinda NA
## 526          c          C          F         GenX     Tamara NA
## 527          c          C          F         GenX     Tracey NA
## 528          c          C          F         GenX    Colleen NA
## 529          c          C          F         GenX     Sherri NA
## 530          c          C          F         GenX       Heidi NA
## 531          c          C          F    Millenial  Samantha NA
## 532          c          C          F    Millenial    Alexis NA
## 533          c          C          F    Millenial   Brittany NA
## 534          c          C          F    Millenial     Lauren NA
## 535          c          C          F    Millenial     Taylor NA
## 536          c          C          F    Millenial    Bethany NA
## 537          c          C          F    Millenial     Latoya NA
## 538          c          C          F    Millenial    Candice NA
## 539          c          C          F    Millenial   Brittney NA
## 540          c          C          F    Millenial   Cheyenne NA
## 541          d          A          M       Boomer   Theodore NA
## 542          d          A          M       Boomer    Bernard NA
## 543          d          A          M       Boomer       Gene NA
## 544          d          A          M       Boomer    Herbert NA
## 545          d          A          M       Boomer        Ray NA
## 546          d          A          M       Boomer        Tom NA
## 547          d          A          M       Boomer        Lee NA
## 548          d          A          M       Boomer     Alfred NA
## 549          d          A          M       Boomer      Leroy NA
## 550          d          A          M       Boomer      Eddie NA
## 551          d          A          M         GenX       Marc NA
## 552          d          A          M         GenX      Jamie NA
## 553          d          A          M         GenX       Greg NA
## 554          d          A          M         GenX     Darryl NA
## 555          d          A          M         GenX        Tim NA
## 556          d          A          M         GenX       Dean NA
## 557          d          A          M         GenX        Jon NA
## 558          d          A          M         GenX      Chris NA
## 559          d          A          M         GenX       Troy NA
## 560          d          A          M         GenX       Jeff NA
## 561          d          A          M    Millenial    Zachary NA
## 562          d          A          M    Millenial      Dylan NA
## 563          d          A          M    Millenial  Christian NA
## 564          d          A          M    Millenial     Wesley NA
## 565          d          A          M    Millenial       Seth NA
## 566          d          A          M    Millenial     Austin NA
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## 567            d          A       M   Millenial    Gabriel NA
## 568            d          A       M   Millenial       Evan NA
## 569            d          A       M   Millenial      Casey NA
## 570            d          A       M   Millenial       Luis NA
## 571            d          A       F      Boomer     Gloria NA
## 572            d          A       F      Boomer       Joan NA
## 573            d          A       F      Boomer    Dorothy NA
## 574            d          A       F      Boomer    Shirley NA
## 575            d          A       F      Boomer      Betty NA
## 576            d          A       F      Boomer     Dianne NA
## 577            d          A       F      Boomer        Kay NA
## 578            d          A       F      Boomer   Marjorie NA
## 579            d          A       F      Boomer   Lorraine NA
## 580            d          A       F      Boomer    Mildred NA
## 581            d          A       F        GenX      Tracy NA
## 582            d          A       F        GenX       Dawn NA
## 583            d          A       F        GenX       Tina NA
## 584            d          A       F        GenX      Tammy NA
## 585            d          A       F        GenX    Melinda NA
## 586            d          A       F        GenX     Tamara NA
## 587            d          A       F        GenX     Tracey NA
## 588            d          A       F        GenX    Colleen NA
## 589            d          A       F        GenX     Sherri NA
## 590            d          A       F        GenX      Heidi NA
## 591            d          A       F   Millenial   Samantha NA
## 592            d          A       F   Millenial     Alexis NA
## 593            d          A       F   Millenial   Brittany NA
## 594            d          A       F   Millenial     Lauren NA
## 595            d          A       F   Millenial     Taylor NA
## 596            d          A       F   Millenial    Bethany NA
## 597            d          A       F   Millenial     Latoya NA
## 598            d          A       F   Millenial    Candice NA
## 599            d          A       F   Millenial   Brittney NA
## 600            d          A       F   Millenial   Cheyenne NA
## 601            d          B       M      Boomer   Theodore NA
## 602            d          B       M      Boomer    Bernard NA
## 603            d          B       M      Boomer       Gene NA
## 604            d          B       M      Boomer    Herbert NA
## 605            d          B       M      Boomer        Ray NA
## 606            d          B       M      Boomer        Tom NA
## 607            d          B       M      Boomer        Lee NA
## 608            d          B       M      Boomer     Alfred NA
## 609            d          B       M      Boomer      Leroy NA
## 610            d          B       M      Boomer      Eddie NA
## 611            d          B       M        GenX       Marc NA
## 612            d          B       M        GenX      Jamie NA
## 613            d          B       M        GenX       Greg NA
## 614            d          B       M        GenX     Darryl NA
## 615            d          B       M        GenX        Tim NA
## 616            d          B       M        GenX       Dean NA
## 617            d          B       M        GenX        Jon NA
## 618            d          B       M        GenX      Chris NA
## 619            d          B       M        GenX       Troy NA
## 620            d          B       M        GenX       Jeff NA
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## 621            d            B            M   Millenial    Zachary NA
## 622            d            B            M   Millenial      Dylan NA
## 623            d            B            M   Millenial  Christian NA
## 624            d            B            M   Millenial     Wesley NA
## 625            d            B            M   Millenial       Seth NA
## 626            d            B            M   Millenial     Austin NA
## 627            d            B            M   Millenial    Gabriel NA
## 628            d            B            M   Millenial       Evan NA
## 629            d            B            M   Millenial      Casey NA
## 630            d            B            M   Millenial       Luis NA
## 631            d            B            F      Boomer     Gloria NA
## 632            d            B            F      Boomer       Joan NA
## 633            d            B            F      Boomer    Dorothy NA
## 634            d            B            F      Boomer    Shirley NA
## 635            d            B            F      Boomer      Betty NA
## 636            d            B            F      Boomer     Dianne NA
## 637            d            B            F      Boomer        Kay NA
## 638            d            B            F      Boomer   Marjorie NA
## 639            d            B            F      Boomer   Lorraine NA
## 640            d            B            F      Boomer    Mildred NA
## 641            d            B            F        GenX      Tracy NA
## 642            d            B            F        GenX       Dawn NA
## 643            d            B            F        GenX       Tina NA
## 644            d            B            F        GenX      Tammy NA
## 645            d            B            F        GenX    Melinda NA
## 646            d            B            F        GenX     Tamara NA
## 647            d            B            F        GenX     Tracey NA
## 648            d            B            F        GenX    Colleen NA
## 649            d            B            F        GenX     Sherri NA
## 650            d            B            F        GenX      Heidi NA
## 651            d            B            F   Millenial   Samantha NA
## 652            d            B            F   Millenial     Alexis NA
## 653            d            B            F   Millenial   Brittany NA
## 654            d            B            F   Millenial     Lauren NA
## 655            d            B            F   Millenial     Taylor NA
## 656            d            B            F   Millenial    Bethany NA
## 657            d            B            F   Millenial     Latoya NA
## 658            d            B            F   Millenial    Candice NA
## 659            d            B            F   Millenial   Brittney NA
## 660            d            B            F   Millenial   Cheyenne NA
## 661            d            C            M      Boomer   Theodore NA
## 662            d            C            M      Boomer    Bernard NA
## 663            d            C            M      Boomer       Gene NA
## 664            d            C            M      Boomer    Herbert NA
## 665            d            C            M      Boomer        Ray NA
## 666            d            C            M      Boomer        Tom NA
## 667            d            C            M      Boomer        Lee NA
## 668            d            C            M      Boomer     Alfred NA
## 669            d            C            M      Boomer      Leroy NA
## 670            d            C            M      Boomer      Eddie NA
## 671            d            C            M        GenX       Marc NA
## 672            d            C            M        GenX      Jamie NA
## 673            d            C            M        GenX       Greg NA
## 674            d            C            M        GenX     Darryl NA
```

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## 675          d          C          M          GenX          Tim NA
## 676          d          C          M          GenX         Dean NA
## 677          d          C          M          GenX          Jon NA
## 678          d          C          M          GenX         Chris NA
## 679          d          C          M          GenX         Troy NA
## 680          d          C          M          GenX         Jeff NA
## 681          d          C          M      Millenial     Zachary NA
## 682          d          C          M      Millenial       Dylan NA
## 683          d          C          M      Millenial   Christian NA
## 684          d          C          M      Millenial      Wesley NA
## 685          d          C          M      Millenial        Seth NA
## 686          d          C          M      Millenial      Austin NA
## 687          d          C          M      Millenial     Gabriel NA
## 688          d          C          M      Millenial        Evan NA
## 689          d          C          M      Millenial       Casey NA
## 690          d          C          M      Millenial        Luis NA
## 691          d          C          F        Boomer      Gloria NA
## 692          d          C          F        Boomer        Joan NA
## 693          d          C          F        Boomer     Dorothy NA
## 694          d          C          F        Boomer     Shirley NA
## 695          d          C          F        Boomer       Betty NA
## 696          d          C          F        Boomer      Dianne NA
## 697          d          C          F        Boomer         Kay NA
## 698          d          C          F        Boomer    Marjorie NA
## 699          d          C          F        Boomer    Lorraine NA
## 700          d          C          F        Boomer     Mildred NA
## 701          d          C          F          GenX       Tracy NA
## 702          d          C          F          GenX        Dawn NA
## 703          d          C          F          GenX        Tina NA
## 704          d          C          F          GenX       Tammy NA
## 705          d          C          F          GenX     Melinda NA
## 706          d          C          F          GenX      Tamara NA
## 707          d          C          F          GenX      Tracey NA
## 708          d          C          F          GenX     Colleen NA
## 709          d          C          F          GenX      Sherri NA
## 710          d          C          F          GenX       Heidi NA
## 711          d          C          F      Millenial    Samantha NA
## 712          d          C          F      Millenial      Alexis NA
## 713          d          C          F      Millenial     Brittany NA
## 714          d          C          F      Millenial      Lauren NA
## 715          d          C          F      Millenial      Taylor NA
## 716          d          C          F      Millenial     Bethany NA
## 717          d          C          F      Millenial      Latoya NA
## 718          d          C          F      Millenial     Candice NA
## 719          d          C          F      Millenial     Brittney NA
## 720          d          C          F      Millenial    Cheyenne NA
## 721          e          A          M        Boomer    Theodore NA
## 722          e          A          M        Boomer     Bernard NA
## 723          e          A          M        Boomer        Gene NA
## 724          e          A          M        Boomer     Herbert NA
## 725          e          A          M        Boomer         Ray NA
## 726          e          A          M        Boomer         Tom NA
## 727          e          A          M        Boomer         Lee NA
## 728          e          A          M        Boomer      Alfred NA
```

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## 729          e          A          M        Boomer       Leroy NA
## 730          e          A          M        Boomer       Eddie NA
## 731          e          A          M          GenX        Marc NA
## 732          e          A          M          GenX       Jamie NA
## 733          e          A          M          GenX        Greg NA
## 734          e          A          M          GenX      Darryl NA
## 735          e          A          M          GenX         Tim NA
## 736          e          A          M          GenX        Dean NA
## 737          e          A          M          GenX         Jon NA
## 738          e          A          M          GenX       Chris NA
## 739          e          A          M          GenX        Troy NA
## 740          e          A          M          GenX        Jeff NA
## 741          e          A          M     Millenial     Zachary NA
## 742          e          A          M     Millenial       Dylan NA
## 743          e          A          M     Millenial   Christian NA
## 744          e          A          M     Millenial      Wesley NA
## 745          e          A          M     Millenial        Seth NA
## 746          e          A          M     Millenial      Austin NA
## 747          e          A          M     Millenial     Gabriel NA
## 748          e          A          M     Millenial        Evan NA
## 749          e          A          M     Millenial       Casey NA
## 750          e          A          M     Millenial        Luis NA
## 751          e          A          F        Boomer      Gloria NA
## 752          e          A          F        Boomer        Joan NA
## 753          e          A          F        Boomer     Dorothy NA
## 754          e          A          F        Boomer     Shirley NA
## 755          e          A          F        Boomer       Betty NA
## 756          e          A          F        Boomer      Dianne NA
## 757          e          A          F        Boomer         Kay NA
## 758          e          A          F        Boomer    Marjorie NA
## 759          e          A          F        Boomer    Lorraine NA
## 760          e          A          F        Boomer     Mildred NA
## 761          e          A          F          GenX       Tracy NA
## 762          e          A          F          GenX        Dawn NA
## 763          e          A          F          GenX        Tina NA
## 764          e          A          F          GenX       Tammy NA
## 765          e          A          F          GenX     Melinda NA
## 766          e          A          F          GenX      Tamara NA
## 767          e          A          F          GenX      Tracey NA
## 768          e          A          F          GenX     Colleen NA
## 769          e          A          F          GenX      Sherri NA
## 770          e          A          F          GenX       Heidi NA
## 771          e          A          F     Millenial    Samantha NA
## 772          e          A          F     Millenial      Alexis NA
## 773          e          A          F     Millenial    Brittany NA
## 774          e          A          F     Millenial      Lauren NA
## 775          e          A          F     Millenial       Taylor NA
## 776          e          A          F     Millenial     Bethany NA
## 777          e          A          F     Millenial      Latoya NA
## 778          e          A          F     Millenial     Candice NA
## 779          e          A          F     Millenial     Brittney NA
## 780          e          A          F     Millenial    Cheyenne NA
## 781          e          B          M        Boomer    Theodore NA
## 782          e          B          M        Boomer     Bernard NA
```

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## 783          e          B          M          Boomer          Gene NA
## 784          e          B          M          Boomer       Herbert NA
## 785          e          B          M          Boomer           Ray NA
## 786          e          B          M          Boomer           Tom NA
## 787          e          B          M          Boomer           Lee NA
## 788          e          B          M          Boomer        Alfred NA
## 789          e          B          M          Boomer         Leroy NA
## 790          e          B          M          Boomer         Eddie NA
## 791          e          B          M            GenX          Marc NA
## 792          e          B          M            GenX         Jamie NA
## 793          e          B          M            GenX          Greg NA
## 794          e          B          M            GenX        Darryl NA
## 795          e          B          M            GenX           Tim NA
## 796          e          B          M            GenX          Dean NA
## 797          e          B          M            GenX           Jon NA
## 798          e          B          M            GenX         Chris NA
## 799          e          B          M            GenX          Troy NA
## 800          e          B          M            GenX          Jeff NA
## 801          e          B          M       Millenial       Zachary NA
## 802          e          B          M       Millenial         Dylan NA
## 803          e          B          M       Millenial     Christian NA
## 804          e          B          M       Millenial        Wesley NA
## 805          e          B          M       Millenial          Seth NA
## 806          e          B          M       Millenial        Austin NA
## 807          e          B          M       Millenial       Gabriel NA
## 808          e          B          M       Millenial          Evan NA
## 809          e          B          M       Millenial         Casey NA
## 810          e          B          M       Millenial          Luis NA
## 811          e          B          F          Boomer        Gloria NA
## 812          e          B          F          Boomer          Joan NA
## 813          e          B          F          Boomer       Dorothy NA
## 814          e          B          F          Boomer       Shirley NA
## 815          e          B          F          Boomer         Betty NA
## 816          e          B          F          Boomer        Dianne NA
## 817          e          B          F          Boomer           Kay NA
## 818          e          B          F          Boomer      Marjorie NA
## 819          e          B          F          Boomer      Lorraine NA
## 820          e          B          F          Boomer       Mildred NA
## 821          e          B          F            GenX         Tracy NA
## 822          e          B          F            GenX          Dawn NA
## 823          e          B          F            GenX          Tina NA
## 824          e          B          F            GenX         Tammy NA
## 825          e          B          F            GenX       Melinda NA
## 826          e          B          F            GenX        Tamara NA
## 827          e          B          F            GenX        Tracey NA
## 828          e          B          F            GenX       Colleen NA
## 829          e          B          F            GenX        Sherri NA
## 830          e          B          F            GenX         Heidi NA
## 831          e          B          F       Millenial      Samantha NA
## 832          e          B          F       Millenial        Alexis NA
## 833          e          B          F       Millenial       Brittany NA
## 834          e          B          F       Millenial        Lauren NA
## 835          e          B          F       Millenial        Taylor NA
## 836          e          B          F       Millenial       Bethany NA
```

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## 837          e          B          F   Millenial     Latoya NA
## 838          e          B          F   Millenial    Candice NA
## 839          e          B          F   Millenial   Brittney NA
## 840          e          B          F   Millenial   Cheyenne NA
## 841          e          C          M      Boomer   Theodore NA
## 842          e          C          M      Boomer    Bernard NA
## 843          e          C          M      Boomer       Gene NA
## 844          e          C          M      Boomer    Herbert NA
## 845          e          C          M      Boomer        Ray NA
## 846          e          C          M      Boomer        Tom NA
## 847          e          C          M      Boomer        Lee NA
## 848          e          C          M      Boomer     Alfred NA
## 849          e          C          M      Boomer      Leroy NA
## 850          e          C          M      Boomer      Eddie NA
## 851          e          C          M        GenX       Marc NA
## 852          e          C          M        GenX      Jamie NA
## 853          e          C          M        GenX       Greg NA
## 854          e          C          M        GenX     Darryl NA
## 855          e          C          M        GenX        Tim NA
## 856          e          C          M        GenX       Dean NA
## 857          e          C          M        GenX        Jon NA
## 858          e          C          M        GenX      Chris NA
## 859          e          C          M        GenX       Troy NA
## 860          e          C          M        GenX       Jeff NA
## 861          e          C          M   Millenial    Zachary NA
## 862          e          C          M   Millenial      Dylan NA
## 863          e          C          M   Millenial  Christian NA
## 864          e          C          M   Millenial     Wesley NA
## 865          e          C          M   Millenial       Seth NA
## 866          e          C          M   Millenial     Austin NA
## 867          e          C          M   Millenial    Gabriel NA
## 868          e          C          M   Millenial       Evan NA
## 869          e          C          M   Millenial      Casey NA
## 870          e          C          M   Millenial       Luis NA
## 871          e          C          F      Boomer     Gloria NA
## 872          e          C          F      Boomer       Joan NA
## 873          e          C          F      Boomer    Dorothy NA
## 874          e          C          F      Boomer    Shirley NA
## 875          e          C          F      Boomer      Betty NA
## 876          e          C          F      Boomer     Dianne NA
## 877          e          C          F      Boomer        Kay NA
## 878          e          C          F      Boomer   Marjorie NA
## 879          e          C          F      Boomer   Lorraine NA
## 880          e          C          F      Boomer    Mildred NA
## 881          e          C          F        GenX      Tracy NA
## 882          e          C          F        GenX       Dawn NA
## 883          e          C          F        GenX       Tina NA
## 884          e          C          F        GenX      Tammy NA
## 885          e          C          F        GenX    Melinda NA
## 886          e          C          F        GenX     Tamara NA
## 887          e          C          F        GenX     Tracey NA
## 888          e          C          F        GenX    Colleen NA
## 889          e          C          F        GenX     Sherri NA
## 890          e          C          F        GenX      Heidi NA
```

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## 891         e          C        F   Millenial   Samantha NA
## 892         e          C        F   Millenial     Alexis NA
## 893         e          C        F   Millenial   Brittany NA
## 894         e          C        F   Millenial     Lauren NA
## 895         e          C        F   Millenial     Taylor NA
## 896         e          C        F   Millenial    Bethany NA
## 897         e          C        F   Millenial     Latoya NA
## 898         e          C        F   Millenial    Candice NA
## 899         e          C        F   Millenial   Brittney NA
## 900         e          C        F   Millenial   Cheyenne NA
## 901         f          A        M      Boomer   Theodore NA
## 902         f          A        M      Boomer    Bernard NA
## 903         f          A        M      Boomer       Gene NA
## 904         f          A        M      Boomer    Herbert NA
## 905         f          A        M      Boomer        Ray NA
## 906         f          A        M      Boomer        Tom NA
## 907         f          A        M      Boomer        Lee NA
## 908         f          A        M      Boomer     Alfred NA
## 909         f          A        M      Boomer      Leroy NA
## 910         f          A        M      Boomer      Eddie NA
## 911         f          A        M        GenX       Marc NA
## 912         f          A        M        GenX      Jamie NA
## 913         f          A        M        GenX       Greg NA
## 914         f          A        M        GenX     Darryl NA
## 915         f          A        M        GenX        Tim NA
## 916         f          A        M        GenX       Dean NA
## 917         f          A        M        GenX        Jon NA
## 918         f          A        M        GenX      Chris NA
## 919         f          A        M        GenX       Troy NA
## 920         f          A        M        GenX       Jeff NA
## 921         f          A        M   Millenial    Zachary NA
## 922         f          A        M   Millenial      Dylan NA
## 923         f          A        M   Millenial  Christian NA
## 924         f          A        M   Millenial     Wesley NA
## 925         f          A        M   Millenial       Seth NA
## 926         f          A        M   Millenial     Austin NA
## 927         f          A        M   Millenial    Gabriel NA
## 928         f          A        M   Millenial       Evan NA
## 929         f          A        M   Millenial      Casey NA
## 930         f          A        M   Millenial       Luis NA
## 931         f          A        F      Boomer     Gloria NA
## 932         f          A        F      Boomer       Joan NA
## 933         f          A        F      Boomer    Dorothy NA
## 934         f          A        F      Boomer    Shirley NA
## 935         f          A        F      Boomer      Betty NA
## 936         f          A        F      Boomer     Dianne NA
## 937         f          A        F      Boomer        Kay NA
## 938         f          A        F      Boomer    Marjorie NA
## 939         f          A        F      Boomer    Lorraine NA
## 940         f          A        F      Boomer    Mildred NA
## 941         f          A        F        GenX      Tracy NA
## 942         f          A        F        GenX       Dawn NA
## 943         f          A        F        GenX       Tina NA
## 944         f          A        F        GenX      Tammy NA
```

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## 945          f          A          F          GenX       Melinda NA
## 946          f          A          F          GenX        Tamara NA
## 947          f          A          F          GenX        Tracey NA
## 948          f          A          F          GenX       Colleen NA
## 949          f          A          F          GenX        Sherri NA
## 950          f          A          F          GenX         Heidi NA
## 951          f          A          F      Millenial     Samantha NA
## 952          f          A          F      Millenial       Alexis NA
## 953          f          A          F      Millenial     Brittany NA
## 954          f          A          F      Millenial       Lauren NA
## 955          f          A          F      Millenial       Taylor NA
## 956          f          A          F      Millenial      Bethany NA
## 957          f          A          F      Millenial       Latoya NA
## 958          f          A          F      Millenial      Candice NA
## 959          f          A          F      Millenial     Brittney NA
## 960          f          A          F      Millenial     Cheyenne NA
## 961          f          B          M        Boomer      Theodore NA
## 962          f          B          M        Boomer       Bernard NA
## 963          f          B          M        Boomer          Gene NA
## 964          f          B          M        Boomer       Herbert NA
## 965          f          B          M        Boomer           Ray NA
## 966          f          B          M        Boomer           Tom NA
## 967          f          B          M        Boomer           Lee NA
## 968          f          B          M        Boomer        Alfred NA
## 969          f          B          M        Boomer         Leroy NA
## 970          f          B          M        Boomer         Eddie NA
## 971          f          B          M          GenX          Marc NA
## 972          f          B          M          GenX         Jamie NA
## 973          f          B          M          GenX          Greg NA
## 974          f          B          M          GenX        Darryl NA
## 975          f          B          M          GenX           Tim NA
## 976          f          B          M          GenX          Dean NA
## 977          f          B          M          GenX           Jon NA
## 978          f          B          M          GenX         Chris NA
## 979          f          B          M          GenX          Troy NA
## 980          f          B          M          GenX          Jeff NA
## 981          f          B          M      Millenial      Zachary NA
## 982          f          B          M      Millenial        Dylan NA
## 983          f          B          M      Millenial    Christian NA
## 984          f          B          M      Millenial       Wesley NA
## 985          f          B          M      Millenial         Seth NA
## 986          f          B          M      Millenial       Austin NA
## 987          f          B          M      Millenial       Gabriel NA
## 988          f          B          M      Millenial         Evan NA
## 989          f          B          M      Millenial        Casey NA
## 990          f          B          M      Millenial         Luis NA
## 991          f          B          F        Boomer        Gloria NA
## 992          f          B          F        Boomer          Joan NA
## 993          f          B          F        Boomer       Dorothy NA
## 994          f          B          F        Boomer       Shirley NA
## 995          f          B          F        Boomer         Betty NA
## 996          f          B          F        Boomer        Dianne NA
## 997          f          B          F        Boomer           Kay NA
## 998          f          B          F        Boomer       Marjorie NA
```

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## 999     f   B   F    Boomer    Lorraine NA
## 1000    f   B   F    Boomer     Mildred NA
## 1001    f   B   F      GenX       Tracy NA
## 1002    f   B   F      GenX        Dawn NA
## 1003    f   B   F      GenX        Tina NA
## 1004    f   B   F      GenX       Tammy NA
## 1005    f   B   F      GenX     Melinda NA
## 1006    f   B   F      GenX      Tamara NA
## 1007    f   B   F      GenX      Tracey NA
## 1008    f   B   F      GenX     Colleen NA
## 1009    f   B   F      GenX      Sherri NA
## 1010    f   B   F      GenX       Heidi NA
## 1011    f   B   F Millenial    Samantha NA
## 1012    f   B   F Millenial      Alexis NA
## 1013    f   B   F Millenial     Brittany NA
## 1014    f   B   F Millenial      Lauren NA
## 1015    f   B   F Millenial       Taylor NA
## 1016    f   B   F Millenial      Bethany NA
## 1017    f   B   F Millenial       Latoya NA
## 1018    f   B   F Millenial      Candice NA
## 1019    f   B   F Millenial      Brittney NA
## 1020    f   B   F Millenial     Cheyenne NA
## 1021    f   C   M    Boomer     Theodore NA
## 1022    f   C   M    Boomer      Bernard NA
## 1023    f   C   M    Boomer         Gene NA
## 1024    f   C   M    Boomer      Herbert NA
## 1025    f   C   M    Boomer          Ray NA
## 1026    f   C   M    Boomer          Tom NA
## 1027    f   C   M    Boomer          Lee NA
## 1028    f   C   M    Boomer       Alfred NA
## 1029    f   C   M    Boomer        Leroy NA
## 1030    f   C   M    Boomer        Eddie NA
## 1031    f   C   M      GenX         Marc NA
## 1032    f   C   M      GenX        Jamie NA
## 1033    f   C   M      GenX         Greg NA
## 1034    f   C   M      GenX       Darryl NA
## 1035    f   C   M      GenX          Tim NA
## 1036    f   C   M      GenX         Dean NA
## 1037    f   C   M      GenX          Jon NA
## 1038    f   C   M      GenX        Chris NA
## 1039    f   C   M      GenX         Troy NA
## 1040    f   C   M      GenX         Jeff NA
## 1041    f   C   M Millenial      Zachary NA
## 1042    f   C   M Millenial        Dylan NA
## 1043    f   C   M Millenial    Christian NA
## 1044    f   C   M Millenial       Wesley NA
## 1045    f   C   M Millenial         Seth NA
## 1046    f   C   M Millenial       Austin NA
## 1047    f   C   M Millenial      Gabriel NA
## 1048    f   C   M Millenial         Evan NA
## 1049    f   C   M Millenial        Casey NA
## 1050    f   C   M Millenial         Luis NA
## 1051    f   C   F    Boomer       Gloria NA
## 1052    f   C   F    Boomer         Joan NA
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## 1053           f         C         F         Boomer      Dorothy NA
## 1054           f         C         F         Boomer      Shirley NA
## 1055           f         C         F         Boomer        Betty NA
## 1056           f         C         F         Boomer       Dianne NA
## 1057           f         C         F         Boomer          Kay NA
## 1058           f         C         F         Boomer      Marjorie NA
## 1059           f         C         F         Boomer      Lorraine NA
## 1060           f         C         F         Boomer       Mildred NA
## 1061           f         C         F           GenX        Tracy NA
## 1062           f         C         F           GenX         Dawn NA
## 1063           f         C         F           GenX         Tina NA
## 1064           f         C         F           GenX        Tammy NA
## 1065           f         C         F           GenX      Melinda NA
## 1066           f         C         F           GenX       Tamara NA
## 1067           f         C         F           GenX       Tracey NA
## 1068           f         C         F           GenX      Colleen NA
## 1069           f         C         F           GenX        Sherri NA
## 1070           f         C         F           GenX        Heidi NA
## 1071           f         C         F       Millenial    Samantha NA
## 1072           f         C         F       Millenial       Alexis NA
## 1073           f         C         F       Millenial      Brittany NA
## 1074           f         C         F       Millenial       Lauren NA
## 1075           f         C         F       Millenial       Taylor NA
## 1076           f         C         F       Millenial      Bethany NA
## 1077           f         C         F       Millenial       Latoya NA
## 1078           f         C         F       Millenial       Candice NA
## 1079           f         C         F       Millenial      Brittney NA
## 1080           f         C         F       Millenial      Cheyenne NA
## 1081           g         A         M         Boomer      Theodore NA
## 1082           g         A         M         Boomer       Bernard NA
## 1083           g         A         M         Boomer          Gene NA
## 1084           g         A         M         Boomer       Herbert NA
## 1085           g         A         M         Boomer           Ray NA
## 1086           g         A         M         Boomer           Tom NA
## 1087           g         A         M         Boomer           Lee NA
## 1088           g         A         M         Boomer        Alfred NA
## 1089           g         A         M         Boomer         Leroy NA
## 1090           g         A         M         Boomer         Eddie NA
## 1091           g         A         M           GenX         Marc NA
## 1092           g         A         M           GenX        Jamie NA
## 1093           g         A         M           GenX         Greg NA
## 1094           g         A         M           GenX       Darryl NA
## 1095           g         A         M           GenX          Tim NA
## 1096           g         A         M           GenX         Dean NA
## 1097           g         A         M           GenX          Jon NA
## 1098           g         A         M           GenX        Chris NA
## 1099           g         A         M           GenX         Troy NA
## 1100           g         A         M           GenX         Jeff NA
## 1101           g         A         M       Millenial      Zachary NA
## 1102           g         A         M       Millenial        Dylan NA
## 1103           g         A         M       Millenial    Christian NA
## 1104           g         A         M       Millenial       Wesley NA
## 1105           g         A         M       Millenial         Seth NA
## 1106           g         A         M       Millenial       Austin NA
```

```
## 1107          g          A          M   Millenial    Gabriel NA
## 1108          g          A          M   Millenial       Evan NA
## 1109          g          A          M   Millenial      Casey NA
## 1110          g          A          M   Millenial       Luis NA
## 1111          g          A          F      Boomer     Gloria NA
## 1112          g          A          F      Boomer       Joan NA
## 1113          g          A          F      Boomer    Dorothy NA
## 1114          g          A          F      Boomer    Shirley NA
## 1115          g          A          F      Boomer      Betty NA
## 1116          g          A          F      Boomer     Dianne NA
## 1117          g          A          F      Boomer        Kay NA
## 1118          g          A          F      Boomer   Marjorie NA
## 1119          g          A          F      Boomer   Lorraine NA
## 1120          g          A          F      Boomer    Mildred NA
## 1121          g          A          F        GenX      Tracy NA
## 1122          g          A          F        GenX       Dawn NA
## 1123          g          A          F        GenX       Tina NA
## 1124          g          A          F        GenX      Tammy NA
## 1125          g          A          F        GenX    Melinda NA
## 1126          g          A          F        GenX     Tamara NA
## 1127          g          A          F        GenX     Tracey NA
## 1128          g          A          F        GenX    Colleen NA
## 1129          g          A          F        GenX     Sherri NA
## 1130          g          A          F        GenX      Heidi NA
## 1131          g          A          F   Millenial   Samantha NA
## 1132          g          A          F   Millenial     Alexis NA
## 1133          g          A          F   Millenial   Brittany NA
## 1134          g          A          F   Millenial     Lauren NA
## 1135          g          A          F   Millenial     Taylor NA
## 1136          g          A          F   Millenial    Bethany NA
## 1137          g          A          F   Millenial     Latoya NA
## 1138          g          A          F   Millenial    Candice NA
## 1139          g          A          F   Millenial   Brittney NA
## 1140          g          A          F   Millenial   Cheyenne NA
## 1141          g          B          M      Boomer   Theodore NA
## 1142          g          B          M      Boomer    Bernard NA
## 1143          g          B          M      Boomer       Gene NA
## 1144          g          B          M      Boomer    Herbert NA
## 1145          g          B          M      Boomer        Ray NA
## 1146          g          B          M      Boomer        Tom NA
## 1147          g          B          M      Boomer        Lee NA
## 1148          g          B          M      Boomer     Alfred NA
## 1149          g          B          M      Boomer      Leroy NA
## 1150          g          B          M      Boomer      Eddie NA
## 1151          g          B          M        GenX       Marc NA
## 1152          g          B          M        GenX      Jamie NA
## 1153          g          B          M        GenX       Greg NA
## 1154          g          B          M        GenX     Darryl NA
## 1155          g          B          M        GenX        Tim NA
## 1156          g          B          M        GenX       Dean NA
## 1157          g          B          M        GenX        Jon NA
## 1158          g          B          M        GenX      Chris NA
## 1159          g          B          M        GenX       Troy NA
## 1160          g          B          M        GenX       Jeff NA
```

```
## 1161          g          B     M     Millenial    Zachary NA
## 1162          g          B     M     Millenial      Dylan NA
## 1163          g          B     M     Millenial  Christian NA
## 1164          g          B     M     Millenial     Wesley NA
## 1165          g          B     M     Millenial       Seth NA
## 1166          g          B     M     Millenial     Austin NA
## 1167          g          B     M     Millenial    Gabriel NA
## 1168          g          B     M     Millenial       Evan NA
## 1169          g          B     M     Millenial      Casey NA
## 1170          g          B     M     Millenial       Luis NA
## 1171          g          B     F       Boomer     Gloria NA
## 1172          g          B     F       Boomer       Joan NA
## 1173          g          B     F       Boomer    Dorothy NA
## 1174          g          B     F       Boomer    Shirley NA
## 1175          g          B     F       Boomer      Betty NA
## 1176          g          B     F       Boomer     Dianne NA
## 1177          g          B     F       Boomer        Kay NA
## 1178          g          B     F       Boomer   Marjorie NA
## 1179          g          B     F       Boomer   Lorraine NA
## 1180          g          B     F       Boomer    Mildred NA
## 1181          g          B     F         GenX      Tracy NA
## 1182          g          B     F         GenX       Dawn NA
## 1183          g          B     F         GenX       Tina NA
## 1184          g          B     F         GenX      Tammy NA
## 1185          g          B     F         GenX    Melinda NA
## 1186          g          B     F         GenX     Tamara NA
## 1187          g          B     F         GenX     Tracey NA
## 1188          g          B     F         GenX    Colleen NA
## 1189          g          B     F         GenX     Sherri NA
## 1190          g          B     F         GenX      Heidi NA
## 1191          g          B     F     Millenial   Samantha NA
## 1192          g          B     F     Millenial     Alexis NA
## 1193          g          B     F     Millenial   Brittany NA
## 1194          g          B     F     Millenial     Lauren NA
## 1195          g          B     F     Millenial     Taylor NA
## 1196          g          B     F     Millenial    Bethany NA
## 1197          g          B     F     Millenial     Latoya NA
## 1198          g          B     F     Millenial    Candice NA
## 1199          g          B     F     Millenial   Brittney NA
## 1200          g          B     F     Millenial   Cheyenne NA
## 1201          g          C     M       Boomer   Theodore NA
## 1202          g          C     M       Boomer    Bernard NA
## 1203          g          C     M       Boomer       Gene NA
## 1204          g          C     M       Boomer    Herbert NA
## 1205          g          C     M       Boomer        Ray NA
## 1206          g          C     M       Boomer        Tom NA
## 1207          g          C     M       Boomer        Lee NA
## 1208          g          C     M       Boomer     Alfred NA
## 1209          g          C     M       Boomer      Leroy NA
## 1210          g          C     M       Boomer      Eddie NA
## 1211          g          C     M         GenX       Marc NA
## 1212          g          C     M         GenX      Jamie NA
## 1213          g          C     M         GenX       Greg NA
## 1214          g          C     M         GenX     Darryl NA
```

```
## 1215           g           C           M           GenX           Tim NA
## 1216           g           C           M           GenX          Dean NA
## 1217           g           C           M           GenX           Jon NA
## 1218           g           C           M           GenX         Chris NA
## 1219           g           C           M           GenX          Troy NA
## 1220           g           C           M           GenX          Jeff NA
## 1221           g           C           M       Millenial      Zachary NA
## 1222           g           C           M       Millenial        Dylan NA
## 1223           g           C           M       Millenial    Christian NA
## 1224           g           C           M       Millenial       Wesley NA
## 1225           g           C           M       Millenial         Seth NA
## 1226           g           C           M       Millenial       Austin NA
## 1227           g           C           M       Millenial      Gabriel NA
## 1228           g           C           M       Millenial         Evan NA
## 1229           g           C           M       Millenial        Casey NA
## 1230           g           C           M       Millenial         Luis NA
## 1231           g           C           F         Boomer       Gloria NA
## 1232           g           C           F         Boomer         Joan NA
## 1233           g           C           F         Boomer      Dorothy NA
## 1234           g           C           F         Boomer      Shirley NA
## 1235           g           C           F         Boomer        Betty NA
## 1236           g           C           F         Boomer       Dianne NA
## 1237           g           C           F         Boomer          Kay NA
## 1238           g           C           F         Boomer     Marjorie NA
## 1239           g           C           F         Boomer     Lorraine NA
## 1240           g           C           F         Boomer      Mildred NA
## 1241           g           C           F           GenX        Tracy NA
## 1242           g           C           F           GenX         Dawn NA
## 1243           g           C           F           GenX         Tina NA
## 1244           g           C           F           GenX        Tammy NA
## 1245           g           C           F           GenX      Melinda NA
## 1246           g           C           F           GenX       Tamara NA
## 1247           g           C           F           GenX       Tracey NA
## 1248           g           C           F           GenX      Colleen NA
## 1249           g           C           F           GenX       Sherri NA
## 1250           g           C           F           GenX        Heidi NA
## 1251           g           C           F       Millenial     Samantha NA
## 1252           g           C           F       Millenial       Alexis NA
## 1253           g           C           F       Millenial      Brittany NA
## 1254           g           C           F       Millenial       Lauren NA
## 1255           g           C           F       Millenial        Taylor NA
## 1256           g           C           F       Millenial       Bethany NA
## 1257           g           C           F       Millenial        Latoya NA
## 1258           g           C           F       Millenial       Candice NA
## 1259           g           C           F       Millenial      Brittney NA
## 1260           g           C           F       Millenial      Cheyenne NA
## 1261           h           A           M         Boomer      Theodore NA
## 1262           h           A           M         Boomer       Bernard NA
## 1263           h           A           M         Boomer          Gene NA
## 1264           h           A           M         Boomer       Herbert NA
## 1265           h           A           M         Boomer           Ray NA
## 1266           h           A           M         Boomer           Tom NA
## 1267           h           A           M         Boomer           Lee NA
## 1268           h           A           M         Boomer        Alfred NA
```

```
## 1269       h         A      M        Boomer       Leroy NA
## 1270       h         A      M        Boomer       Eddie NA
## 1271       h         A      M          GenX        Marc NA
## 1272       h         A      M          GenX       Jamie NA
## 1273       h         A      M          GenX        Greg NA
## 1274       h         A      M          GenX      Darryl NA
## 1275       h         A      M          GenX         Tim NA
## 1276       h         A      M          GenX        Dean NA
## 1277       h         A      M          GenX         Jon NA
## 1278       h         A      M          GenX       Chris NA
## 1279       h         A      M          GenX        Troy NA
## 1280       h         A      M          GenX        Jeff NA
## 1281       h         A      M     Millenial     Zachary NA
## 1282       h         A      M     Millenial       Dylan NA
## 1283       h         A      M     Millenial   Christian NA
## 1284       h         A      M     Millenial      Wesley NA
## 1285       h         A      M     Millenial        Seth NA
## 1286       h         A      M     Millenial      Austin NA
## 1287       h         A      M     Millenial     Gabriel NA
## 1288       h         A      M     Millenial        Evan NA
## 1289       h         A      M     Millenial       Casey NA
## 1290       h         A      M     Millenial        Luis NA
## 1291       h         A      F        Boomer      Gloria NA
## 1292       h         A      F        Boomer        Joan NA
## 1293       h         A      F        Boomer     Dorothy NA
## 1294       h         A      F        Boomer     Shirley NA
## 1295       h         A      F        Boomer       Betty NA
## 1296       h         A      F        Boomer      Dianne NA
## 1297       h         A      F        Boomer         Kay NA
## 1298       h         A      F        Boomer    Marjorie NA
## 1299       h         A      F        Boomer    Lorraine NA
## 1300       h         A      F        Boomer     Mildred NA
## 1301       h         A      F          GenX       Tracy NA
## 1302       h         A      F          GenX        Dawn NA
## 1303       h         A      F          GenX        Tina NA
## 1304       h         A      F          GenX       Tammy NA
## 1305       h         A      F          GenX     Melinda NA
## 1306       h         A      F          GenX      Tamara NA
## 1307       h         A      F          GenX      Tracey NA
## 1308       h         A      F          GenX     Colleen NA
## 1309       h         A      F          GenX      Sherri NA
## 1310       h         A      F          GenX       Heidi NA
## 1311       h         A      F     Millenial    Samantha NA
## 1312       h         A      F     Millenial      Alexis NA
## 1313       h         A      F     Millenial     Brittany NA
## 1314       h         A      F     Millenial      Lauren NA
## 1315       h         A      F     Millenial      Taylor NA
## 1316       h         A      F     Millenial     Bethany NA
## 1317       h         A      F     Millenial      Latoya NA
## 1318       h         A      F     Millenial     Candice NA
## 1319       h         A      F     Millenial     Brittney NA
## 1320       h         A      F     Millenial    Cheyenne NA
## 1321       h         B      M        Boomer    Theodore NA
## 1322       h         B      M        Boomer     Bernard NA
```

```
## 1323          h          B          M          Boomer       Gene NA
## 1324          h          B          M          Boomer    Herbert NA
## 1325          h          B          M          Boomer        Ray NA
## 1326          h          B          M          Boomer        Tom NA
## 1327          h          B          M          Boomer        Lee NA
## 1328          h          B          M          Boomer     Alfred NA
## 1329          h          B          M          Boomer      Leroy NA
## 1330          h          B          M          Boomer      Eddie NA
## 1331          h          B          M            GenX       Marc NA
## 1332          h          B          M            GenX      Jamie NA
## 1333          h          B          M            GenX       Greg NA
## 1334          h          B          M            GenX     Darryl NA
## 1335          h          B          M            GenX        Tim NA
## 1336          h          B          M            GenX       Dean NA
## 1337          h          B          M            GenX        Jon NA
## 1338          h          B          M            GenX      Chris NA
## 1339          h          B          M            GenX       Troy NA
## 1340          h          B          M            GenX       Jeff NA
## 1341          h          B          M       Millenial    Zachary NA
## 1342          h          B          M       Millenial      Dylan NA
## 1343          h          B          M       Millenial  Christian NA
## 1344          h          B          M       Millenial     Wesley NA
## 1345          h          B          M       Millenial       Seth NA
## 1346          h          B          M       Millenial     Austin NA
## 1347          h          B          M       Millenial    Gabriel NA
## 1348          h          B          M       Millenial       Evan NA
## 1349          h          B          M       Millenial      Casey NA
## 1350          h          B          M       Millenial       Luis NA
## 1351          h          B          F          Boomer     Gloria NA
## 1352          h          B          F          Boomer       Joan NA
## 1353          h          B          F          Boomer    Dorothy NA
## 1354          h          B          F          Boomer    Shirley NA
## 1355          h          B          F          Boomer      Betty NA
## 1356          h          B          F          Boomer     Dianne NA
## 1357          h          B          F          Boomer        Kay NA
## 1358          h          B          F          Boomer   Marjorie NA
## 1359          h          B          F          Boomer   Lorraine NA
## 1360          h          B          F          Boomer    Mildred NA
## 1361          h          B          F            GenX      Tracy NA
## 1362          h          B          F            GenX       Dawn NA
## 1363          h          B          F            GenX       Tina NA
## 1364          h          B          F            GenX      Tammy NA
## 1365          h          B          F            GenX    Melinda NA
## 1366          h          B          F            GenX     Tamara NA
## 1367          h          B          F            GenX     Tracey NA
## 1368          h          B          F            GenX    Colleen NA
## 1369          h          B          F            GenX     Sherri NA
## 1370          h          B          F            GenX      Heidi NA
## 1371          h          B          F       Millenial   Samantha NA
## 1372          h          B          F       Millenial     Alexis NA
## 1373          h          B          F       Millenial    Brittany NA
## 1374          h          B          F       Millenial     Lauren NA
## 1375          h          B          F       Millenial      Taylor NA
## 1376          h          B          F       Millenial     Bethany NA
```

```
## 1377        h         B         F  Millenial     Latoya NA
## 1378        h         B         F  Millenial    Candice NA
## 1379        h         B         F  Millenial   Brittney NA
## 1380        h         B         F  Millenial   Cheyenne NA
## 1381        h         C         M     Boomer   Theodore NA
## 1382        h         C         M     Boomer    Bernard NA
## 1383        h         C         M     Boomer       Gene NA
## 1384        h         C         M     Boomer    Herbert NA
## 1385        h         C         M     Boomer        Ray NA
## 1386        h         C         M     Boomer        Tom NA
## 1387        h         C         M     Boomer        Lee NA
## 1388        h         C         M     Boomer     Alfred NA
## 1389        h         C         M     Boomer      Leroy NA
## 1390        h         C         M     Boomer      Eddie NA
## 1391        h         C         M       GenX       Marc NA
## 1392        h         C         M       GenX      Jamie NA
## 1393        h         C         M       GenX       Greg NA
## 1394        h         C         M       GenX     Darryl NA
## 1395        h         C         M       GenX        Tim NA
## 1396        h         C         M       GenX       Dean NA
## 1397        h         C         M       GenX        Jon NA
## 1398        h         C         M       GenX      Chris NA
## 1399        h         C         M       GenX       Troy NA
## 1400        h         C         M       GenX       Jeff NA
## 1401        h         C         M  Millenial    Zachary NA
## 1402        h         C         M  Millenial      Dylan NA
## 1403        h         C         M  Millenial  Christian NA
## 1404        h         C         M  Millenial     Wesley NA
## 1405        h         C         M  Millenial       Seth NA
## 1406        h         C         M  Millenial     Austin NA
## 1407        h         C         M  Millenial    Gabriel NA
## 1408        h         C         M  Millenial       Evan NA
## 1409        h         C         M  Millenial      Casey NA
## 1410        h         C         M  Millenial       Luis NA
## 1411        h         C         F     Boomer     Gloria NA
## 1412        h         C         F     Boomer       Joan NA
## 1413        h         C         F     Boomer    Dorothy NA
## 1414        h         C         F     Boomer    Shirley NA
## 1415        h         C         F     Boomer      Betty NA
## 1416        h         C         F     Boomer     Dianne NA
## 1417        h         C         F     Boomer        Kay NA
## 1418        h         C         F     Boomer   Marjorie NA
## 1419        h         C         F     Boomer   Lorraine NA
## 1420        h         C         F     Boomer    Mildred NA
## 1421        h         C         F       GenX      Tracy NA
## 1422        h         C         F       GenX       Dawn NA
## 1423        h         C         F       GenX       Tina NA
## 1424        h         C         F       GenX      Tammy NA
## 1425        h         C         F       GenX    Melinda NA
## 1426        h         C         F       GenX     Tamara NA
## 1427        h         C         F       GenX     Tracey NA
## 1428        h         C         F       GenX    Colleen NA
## 1429        h         C         F       GenX     Sherri NA
## 1430        h         C         F       GenX      Heidi NA
```

```
## 1431        h        C        F    Millenial   Samantha NA
## 1432        h        C        F    Millenial     Alexis NA
## 1433        h        C        F    Millenial    Brittany NA
## 1434        h        C        F    Millenial      Lauren NA
## 1435        h        C        F    Millenial      Taylor NA
## 1436        h        C        F    Millenial     Bethany NA
## 1437        h        C        F    Millenial      Latoya NA
## 1438        h        C        F    Millenial     Candice NA
## 1439        h        C        F    Millenial    Brittney NA
## 1440        h        C        F    Millenial    Cheyenne NA
## 1441        i        A        M       Boomer    Theodore NA
## 1442        i        A        M       Boomer     Bernard NA
## 1443        i        A        M       Boomer        Gene NA
## 1444        i        A        M       Boomer     Herbert NA
## 1445        i        A        M       Boomer         Ray NA
## 1446        i        A        M       Boomer         Tom NA
## 1447        i        A        M       Boomer         Lee NA
## 1448        i        A        M       Boomer      Alfred NA
## 1449        i        A        M       Boomer       Leroy NA
## 1450        i        A        M       Boomer       Eddie NA
## 1451        i        A        M         GenX        Marc NA
## 1452        i        A        M         GenX       Jamie NA
## 1453        i        A        M         GenX        Greg NA
## 1454        i        A        M         GenX      Darryl NA
## 1455        i        A        M         GenX         Tim NA
## 1456        i        A        M         GenX        Dean NA
## 1457        i        A        M         GenX         Jon NA
## 1458        i        A        M         GenX       Chris NA
## 1459        i        A        M         GenX        Troy NA
## 1460        i        A        M         GenX        Jeff NA
## 1461        i        A        M    Millenial     Zachary NA
## 1462        i        A        M    Millenial       Dylan NA
## 1463        i        A        M    Millenial   Christian NA
## 1464        i        A        M    Millenial      Wesley NA
## 1465        i        A        M    Millenial        Seth NA
## 1466        i        A        M    Millenial      Austin NA
## 1467        i        A        M    Millenial     Gabriel NA
## 1468        i        A        M    Millenial        Evan NA
## 1469        i        A        M    Millenial       Casey NA
## 1470        i        A        M    Millenial        Luis NA
## 1471        i        A        F       Boomer      Gloria NA
## 1472        i        A        F       Boomer        Joan NA
## 1473        i        A        F       Boomer     Dorothy NA
## 1474        i        A        F       Boomer     Shirley NA
## 1475        i        A        F       Boomer       Betty NA
## 1476        i        A        F       Boomer      Dianne NA
## 1477        i        A        F       Boomer         Kay NA
## 1478        i        A        F       Boomer    Marjorie NA
## 1479        i        A        F       Boomer     Lorraine NA
## 1480        i        A        F       Boomer     Mildred NA
## 1481        i        A        F         GenX       Tracy NA
## 1482        i        A        F         GenX        Dawn NA
## 1483        i        A        F         GenX        Tina NA
## 1484        i        A        F         GenX       Tammy NA
```

```
## 1485          i          A          F          GenX       Melinda NA
## 1486          i          A          F          GenX        Tamara NA
## 1487          i          A          F          GenX        Tracey NA
## 1488          i          A          F          GenX       Colleen NA
## 1489          i          A          F          GenX        Sherri NA
## 1490          i          A          F          GenX         Heidi NA
## 1491          i          A          F      Millenial    Samantha NA
## 1492          i          A          F      Millenial      Alexis NA
## 1493          i          A          F      Millenial     Brittany NA
## 1494          i          A          F      Millenial       Lauren NA
## 1495          i          A          F      Millenial       Taylor NA
## 1496          i          A          F      Millenial      Bethany NA
## 1497          i          A          F      Millenial       Latoya NA
## 1498          i          A          F      Millenial      Candice NA
## 1499          i          A          F      Millenial     Brittney NA
## 1500          i          A          F      Millenial     Cheyenne NA
## 1501          i          B          M         Boomer     Theodore NA
## 1502          i          B          M         Boomer      Bernard NA
## 1503          i          B          M         Boomer         Gene NA
## 1504          i          B          M         Boomer      Herbert NA
## 1505          i          B          M         Boomer          Ray NA
## 1506          i          B          M         Boomer          Tom NA
## 1507          i          B          M         Boomer          Lee NA
## 1508          i          B          M         Boomer       Alfred NA
## 1509          i          B          M         Boomer        Leroy NA
## 1510          i          B          M         Boomer        Eddie NA
## 1511          i          B          M           GenX         Marc NA
## 1512          i          B          M           GenX        Jamie NA
## 1513          i          B          M           GenX         Greg NA
## 1514          i          B          M           GenX       Darryl NA
## 1515          i          B          M           GenX          Tim NA
## 1516          i          B          M           GenX         Dean NA
## 1517          i          B          M           GenX          Jon NA
## 1518          i          B          M           GenX        Chris NA
## 1519          i          B          M           GenX         Troy NA
## 1520          i          B          M           GenX         Jeff NA
## 1521          i          B          M      Millenial      Zachary NA
## 1522          i          B          M      Millenial        Dylan NA
## 1523          i          B          M      Millenial    Christian NA
## 1524          i          B          M      Millenial       Wesley NA
## 1525          i          B          M      Millenial         Seth NA
## 1526          i          B          M      Millenial       Austin NA
## 1527          i          B          M      Millenial       Gabriel NA
## 1528          i          B          M      Millenial         Evan NA
## 1529          i          B          M      Millenial        Casey NA
## 1530          i          B          M      Millenial         Luis NA
## 1531          i          B          F         Boomer       Gloria NA
## 1532          i          B          F         Boomer         Joan NA
## 1533          i          B          F         Boomer      Dorothy NA
## 1534          i          B          F         Boomer      Shirley NA
## 1535          i          B          F         Boomer        Betty NA
## 1536          i          B          F         Boomer       Dianne NA
## 1537          i          B          F         Boomer          Kay NA
## 1538          i          B          F         Boomer      Marjorie NA
```

```
## 1539       i       B       F       Boomer     Lorraine NA
## 1540       i       B       F       Boomer      Mildred NA
## 1541       i       B       F         GenX        Tracy NA
## 1542       i       B       F         GenX         Dawn NA
## 1543       i       B       F         GenX         Tina NA
## 1544       i       B       F         GenX        Tammy NA
## 1545       i       B       F         GenX      Melinda NA
## 1546       i       B       F         GenX       Tamara NA
## 1547       i       B       F         GenX       Tracey NA
## 1548       i       B       F         GenX      Colleen NA
## 1549       i       B       F         GenX       Sherri NA
## 1550       i       B       F         GenX        Heidi NA
## 1551       i       B       F    Millenial     Samantha NA
## 1552       i       B       F    Millenial       Alexis NA
## 1553       i       B       F    Millenial      Brittany NA
## 1554       i       B       F    Millenial       Lauren NA
## 1555       i       B       F    Millenial        Taylor NA
## 1556       i       B       F    Millenial       Bethany NA
## 1557       i       B       F    Millenial        Latoya NA
## 1558       i       B       F    Millenial       Candice NA
## 1559       i       B       F    Millenial       Brittney NA
## 1560       i       B       F    Millenial      Cheyenne NA
## 1561       i       C       M       Boomer     Theodore NA
## 1562       i       C       M       Boomer      Bernard NA
## 1563       i       C       M       Boomer         Gene NA
## 1564       i       C       M       Boomer      Herbert NA
## 1565       i       C       M       Boomer          Ray NA
## 1566       i       C       M       Boomer          Tom NA
## 1567       i       C       M       Boomer          Lee NA
## 1568       i       C       M       Boomer       Alfred NA
## 1569       i       C       M       Boomer        Leroy NA
## 1570       i       C       M       Boomer        Eddie NA
## 1571       i       C       M         GenX         Marc NA
## 1572       i       C       M         GenX        Jamie NA
## 1573       i       C       M         GenX         Greg NA
## 1574       i       C       M         GenX       Darryl NA
## 1575       i       C       M         GenX          Tim NA
## 1576       i       C       M         GenX         Dean NA
## 1577       i       C       M         GenX          Jon NA
## 1578       i       C       M         GenX        Chris NA
## 1579       i       C       M         GenX         Troy NA
## 1580       i       C       M         GenX         Jeff NA
## 1581       i       C       M    Millenial      Zachary NA
## 1582       i       C       M    Millenial        Dylan NA
## 1583       i       C       M    Millenial    Christian NA
## 1584       i       C       M    Millenial       Wesley NA
## 1585       i       C       M    Millenial         Seth NA
## 1586       i       C       M    Millenial       Austin NA
## 1587       i       C       M    Millenial      Gabriel NA
## 1588       i       C       M    Millenial         Evan NA
## 1589       i       C       M    Millenial        Casey NA
## 1590       i       C       M    Millenial         Luis NA
## 1591       i       C       F       Boomer       Gloria NA
## 1592       i       C       F       Boomer         Joan NA
```

```
## 1593         i         C         F         Boomer     Dorothy NA
## 1594         i         C         F         Boomer     Shirley NA
## 1595         i         C         F         Boomer       Betty NA
## 1596         i         C         F         Boomer      Dianne NA
## 1597         i         C         F         Boomer         Kay NA
## 1598         i         C         F         Boomer     Marjorie NA
## 1599         i         C         F         Boomer     Lorraine NA
## 1600         i         C         F         Boomer      Mildred NA
## 1601         i         C         F           GenX       Tracy NA
## 1602         i         C         F           GenX        Dawn NA
## 1603         i         C         F           GenX        Tina NA
## 1604         i         C         F           GenX       Tammy NA
## 1605         i         C         F           GenX     Melinda NA
## 1606         i         C         F           GenX      Tamara NA
## 1607         i         C         F           GenX      Tracey NA
## 1608         i         C         F           GenX     Colleen NA
## 1609         i         C         F           GenX      Sherri NA
## 1610         i         C         F           GenX       Heidi NA
## 1611         i         C         F      Millenial    Samantha NA
## 1612         i         C         F      Millenial      Alexis NA
## 1613         i         C         F      Millenial     Brittany NA
## 1614         i         C         F      Millenial      Lauren NA
## 1615         i         C         F      Millenial      Taylor NA
## 1616         i         C         F      Millenial     Bethany NA
## 1617         i         C         F      Millenial      Latoya NA
## 1618         i         C         F      Millenial     Candice NA
## 1619         i         C         F      Millenial     Brittney NA
## 1620         i         C         F      Millenial     Cheyenne NA
## 1621         j         A         M         Boomer    Theodore NA
## 1622         j         A         M         Boomer     Bernard NA
## 1623         j         A         M         Boomer        Gene NA
## 1624         j         A         M         Boomer     Herbert NA
## 1625         j         A         M         Boomer         Ray NA
## 1626         j         A         M         Boomer         Tom NA
## 1627         j         A         M         Boomer         Lee NA
## 1628         j         A         M         Boomer      Alfred NA
## 1629         j         A         M         Boomer       Leroy NA
## 1630         j         A         M         Boomer       Eddie NA
## 1631         j         A         M           GenX        Marc NA
## 1632         j         A         M           GenX       Jamie NA
## 1633         j         A         M           GenX        Greg NA
## 1634         j         A         M           GenX      Darryl NA
## 1635         j         A         M           GenX         Tim NA
## 1636         j         A         M           GenX        Dean NA
## 1637         j         A         M           GenX         Jon NA
## 1638         j         A         M           GenX       Chris NA
## 1639         j         A         M           GenX        Troy NA
## 1640         j         A         M           GenX        Jeff NA
## 1641         j         A         M      Millenial     Zachary NA
## 1642         j         A         M      Millenial       Dylan NA
## 1643         j         A         M      Millenial    Christian NA
## 1644         j         A         M      Millenial      Wesley NA
## 1645         j         A         M      Millenial        Seth NA
## 1646         j         A         M      Millenial      Austin NA
```

```
## 1647        j          A        M    Millenial     Gabriel NA
## 1648        j          A        M    Millenial        Evan NA
## 1649        j          A        M    Millenial       Casey NA
## 1650        j          A        M    Millenial        Luis NA
## 1651        j          A        F       Boomer      Gloria NA
## 1652        j          A        F       Boomer        Joan NA
## 1653        j          A        F       Boomer     Dorothy NA
## 1654        j          A        F       Boomer     Shirley NA
## 1655        j          A        F       Boomer       Betty NA
## 1656        j          A        F       Boomer      Dianne NA
## 1657        j          A        F       Boomer         Kay NA
## 1658        j          A        F       Boomer     Marjorie NA
## 1659        j          A        F       Boomer     Lorraine NA
## 1660        j          A        F       Boomer      Mildred NA
## 1661        j          A        F         GenX       Tracy NA
## 1662        j          A        F         GenX        Dawn NA
## 1663        j          A        F         GenX        Tina NA
## 1664        j          A        F         GenX       Tammy NA
## 1665        j          A        F         GenX     Melinda NA
## 1666        j          A        F         GenX      Tamara NA
## 1667        j          A        F         GenX      Tracey NA
## 1668        j          A        F         GenX     Colleen NA
## 1669        j          A        F         GenX      Sherri NA
## 1670        j          A        F         GenX       Heidi NA
## 1671        j          A        F    Millenial    Samantha NA
## 1672        j          A        F    Millenial      Alexis NA
## 1673        j          A        F    Millenial     Brittany NA
## 1674        j          A        F    Millenial      Lauren NA
## 1675        j          A        F    Millenial      Taylor NA
## 1676        j          A        F    Millenial     Bethany NA
## 1677        j          A        F    Millenial      Latoya NA
## 1678        j          A        F    Millenial     Candice NA
## 1679        j          A        F    Millenial     Brittney NA
## 1680        j          A        F    Millenial     Cheyenne NA
## 1681        j          B        M       Boomer     Theodore NA
## 1682        j          B        M       Boomer     Bernard NA
## 1683        j          B        M       Boomer        Gene NA
## 1684        j          B        M       Boomer     Herbert NA
## 1685        j          B        M       Boomer         Ray NA
## 1686        j          B        M       Boomer         Tom NA
## 1687        j          B        M       Boomer         Lee NA
## 1688        j          B        M       Boomer      Alfred NA
## 1689        j          B        M       Boomer       Leroy NA
## 1690        j          B        M       Boomer       Eddie NA
## 1691        j          B        M         GenX        Marc NA
## 1692        j          B        M         GenX       Jamie NA
## 1693        j          B        M         GenX        Greg NA
## 1694        j          B        M         GenX      Darryl NA
## 1695        j          B        M         GenX         Tim NA
## 1696        j          B        M         GenX        Dean NA
## 1697        j          B        M         GenX         Jon NA
## 1698        j          B        M         GenX       Chris NA
## 1699        j          B        M         GenX        Troy NA
## 1700        j          B        M         GenX        Jeff NA
```

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## 1701          j          B          M   Millenial    Zachary NA
## 1702          j          B          M   Millenial      Dylan NA
## 1703          j          B          M   Millenial  Christian NA
## 1704          j          B          M   Millenial     Wesley NA
## 1705          j          B          M   Millenial       Seth NA
## 1706          j          B          M   Millenial     Austin NA
## 1707          j          B          M   Millenial    Gabriel NA
## 1708          j          B          M   Millenial       Evan NA
## 1709          j          B          M   Millenial      Casey NA
## 1710          j          B          M   Millenial       Luis NA
## 1711          j          B          F      Boomer     Gloria NA
## 1712          j          B          F      Boomer       Joan NA
## 1713          j          B          F      Boomer    Dorothy NA
## 1714          j          B          F      Boomer    Shirley NA
## 1715          j          B          F      Boomer      Betty NA
## 1716          j          B          F      Boomer     Dianne NA
## 1717          j          B          F      Boomer        Kay NA
## 1718          j          B          F      Boomer   Marjorie NA
## 1719          j          B          F      Boomer   Lorraine NA
## 1720          j          B          F      Boomer    Mildred NA
## 1721          j          B          F        GenX      Tracy NA
## 1722          j          B          F        GenX       Dawn NA
## 1723          j          B          F        GenX       Tina NA
## 1724          j          B          F        GenX      Tammy NA
## 1725          j          B          F        GenX    Melinda NA
## 1726          j          B          F        GenX     Tamara NA
## 1727          j          B          F        GenX     Tracey NA
## 1728          j          B          F        GenX    Colleen NA
## 1729          j          B          F        GenX     Sherri NA
## 1730          j          B          F        GenX      Heidi NA
## 1731          j          B          F   Millenial   Samantha NA
## 1732          j          B          F   Millenial     Alexis NA
## 1733          j          B          F   Millenial   Brittany NA
## 1734          j          B          F   Millenial     Lauren NA
## 1735          j          B          F   Millenial     Taylor NA
## 1736          j          B          F   Millenial    Bethany NA
## 1737          j          B          F   Millenial     Latoya NA
## 1738          j          B          F   Millenial    Candice NA
## 1739          j          B          F   Millenial   Brittney NA
## 1740          j          B          F   Millenial   Cheyenne NA
## 1741          j          C          M      Boomer   Theodore NA
## 1742          j          C          M      Boomer    Bernard NA
## 1743          j          C          M      Boomer       Gene NA
## 1744          j          C          M      Boomer    Herbert NA
## 1745          j          C          M      Boomer        Ray NA
## 1746          j          C          M      Boomer        Tom NA
## 1747          j          C          M      Boomer        Lee NA
## 1748          j          C          M      Boomer     Alfred NA
## 1749          j          C          M      Boomer      Leroy NA
## 1750          j          C          M      Boomer      Eddie NA
## 1751          j          C          M        GenX       Marc NA
## 1752          j          C          M        GenX      Jamie NA
## 1753          j          C          M        GenX       Greg NA
## 1754          j          C          M        GenX     Darryl NA
```

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## 1755          j           C         M         GenX          Tim NA
## 1756          j           C         M         GenX         Dean NA
## 1757          j           C         M         GenX          Jon NA
## 1758          j           C         M         GenX        Chris NA
## 1759          j           C         M         GenX         Troy NA
## 1760          j           C         M         GenX         Jeff NA
## 1761          j           C         M     Millenial     Zachary NA
## 1762          j           C         M     Millenial       Dylan NA
## 1763          j           C         M     Millenial   Christian NA
## 1764          j           C         M     Millenial      Wesley NA
## 1765          j           C         M     Millenial        Seth NA
## 1766          j           C         M     Millenial      Austin NA
## 1767          j           C         M     Millenial      Gabriel NA
## 1768          j           C         M     Millenial        Evan NA
## 1769          j           C         M     Millenial       Casey NA
## 1770          j           C         M     Millenial        Luis NA
## 1771          j           C         F       Boomer       Gloria NA
## 1772          j           C         F       Boomer         Joan NA
## 1773          j           C         F       Boomer      Dorothy NA
## 1774          j           C         F       Boomer      Shirley NA
## 1775          j           C         F       Boomer        Betty NA
## 1776          j           C         F       Boomer       Dianne NA
## 1777          j           C         F       Boomer          Kay NA
## 1778          j           C         F       Boomer     Marjorie NA
## 1779          j           C         F       Boomer     Lorraine NA
## 1780          j           C         F       Boomer      Mildred NA
## 1781          j           C         F         GenX        Tracy NA
## 1782          j           C         F         GenX         Dawn NA
## 1783          j           C         F         GenX         Tina NA
## 1784          j           C         F         GenX        Tammy NA
## 1785          j           C         F         GenX      Melinda NA
## 1786          j           C         F         GenX       Tamara NA
## 1787          j           C         F         GenX       Tracey NA
## 1788          j           C         F         GenX      Colleen NA
## 1789          j           C         F         GenX       Sherri NA
## 1790          j           C         F         GenX        Heidi NA
## 1791          j           C         F     Millenial    Samantha NA
## 1792          j           C         F     Millenial      Alexis NA
## 1793          j           C         F     Millenial     Brittany NA
## 1794          j           C         F     Millenial       Lauren NA
## 1795          j           C         F     Millenial       Taylor NA
## 1796          j           C         F     Millenial      Bethany NA
## 1797          j           C         F     Millenial       Latoya NA
## 1798          j           C         F     Millenial      Candice NA
## 1799          j           C         F     Millenial     Brittney NA
## 1800          j           C         F     Millenial     Cheyenne NA
## 1801          k           A         M       Boomer     Theodore NA
## 1802          k           A         M       Boomer      Bernard NA
## 1803          k           A         M       Boomer         Gene NA
## 1804          k           A         M       Boomer      Herbert NA
## 1805          k           A         M       Boomer          Ray NA
## 1806          k           A         M       Boomer          Tom NA
## 1807          k           A         M       Boomer          Lee NA
## 1808          k           A         M       Boomer       Alfred NA
```

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## 1809          k          A          M     Boomer     Leroy NA
## 1810          k          A          M     Boomer     Eddie NA
## 1811          k          A          M       GenX      Marc NA
## 1812          k          A          M       GenX     Jamie NA
## 1813          k          A          M       GenX      Greg NA
## 1814          k          A          M       GenX    Darryl NA
## 1815          k          A          M       GenX       Tim NA
## 1816          k          A          M       GenX      Dean NA
## 1817          k          A          M       GenX       Jon NA
## 1818          k          A          M       GenX     Chris NA
## 1819          k          A          M       GenX      Troy NA
## 1820          k          A          M       GenX      Jeff NA
## 1821          k          A          M Millenial   Zachary NA
## 1822          k          A          M Millenial     Dylan NA
## 1823          k          A          M Millenial Christian NA
## 1824          k          A          M Millenial    Wesley NA
## 1825          k          A          M Millenial      Seth NA
## 1826          k          A          M Millenial    Austin NA
## 1827          k          A          M Millenial   Gabriel NA
## 1828          k          A          M Millenial      Evan NA
## 1829          k          A          M Millenial     Casey NA
## 1830          k          A          M Millenial      Luis NA
## 1831          k          A          F     Boomer    Gloria NA
## 1832          k          A          F     Boomer      Joan NA
## 1833          k          A          F     Boomer   Dorothy NA
## 1834          k          A          F     Boomer   Shirley NA
## 1835          k          A          F     Boomer     Betty NA
## 1836          k          A          F     Boomer    Dianne NA
## 1837          k          A          F     Boomer       Kay NA
## 1838          k          A          F     Boomer  Marjorie NA
## 1839          k          A          F     Boomer  Lorraine NA
## 1840          k          A          F     Boomer   Mildred NA
## 1841          k          A          F       GenX     Tracy NA
## 1842          k          A          F       GenX      Dawn NA
## 1843          k          A          F       GenX      Tina NA
## 1844          k          A          F       GenX     Tammy NA
## 1845          k          A          F       GenX   Melinda NA
## 1846          k          A          F       GenX    Tamara NA
## 1847          k          A          F       GenX    Tracey NA
## 1848          k          A          F       GenX   Colleen NA
## 1849          k          A          F       GenX    Sherri NA
## 1850          k          A          F       GenX     Heidi NA
## 1851          k          A          F Millenial  Samantha NA
## 1852          k          A          F Millenial    Alexis NA
## 1853          k          A          F Millenial   Brittany NA
## 1854          k          A          F Millenial    Lauren NA
## 1855          k          A          F Millenial    Taylor NA
## 1856          k          A          F Millenial   Bethany NA
## 1857          k          A          F Millenial    Latoya NA
## 1858          k          A          F Millenial    Candice NA
## 1859          k          A          F Millenial   Brittney NA
## 1860          k          A          F Millenial  Cheyenne NA
## 1861          k          B          M     Boomer  Theodore NA
## 1862          k          B          M     Boomer   Bernard NA
```

```
## 1863          k          B          M       Boomer      Gene NA
## 1864          k          B          M       Boomer   Herbert NA
## 1865          k          B          M       Boomer       Ray NA
## 1866          k          B          M       Boomer       Tom NA
## 1867          k          B          M       Boomer       Lee NA
## 1868          k          B          M       Boomer    Alfred NA
## 1869          k          B          M       Boomer     Leroy NA
## 1870          k          B          M       Boomer     Eddie NA
## 1871          k          B          M         GenX      Marc NA
## 1872          k          B          M         GenX     Jamie NA
## 1873          k          B          M         GenX      Greg NA
## 1874          k          B          M         GenX    Darryl NA
## 1875          k          B          M         GenX       Tim NA
## 1876          k          B          M         GenX      Dean NA
## 1877          k          B          M         GenX       Jon NA
## 1878          k          B          M         GenX     Chris NA
## 1879          k          B          M         GenX      Troy NA
## 1880          k          B          M         GenX      Jeff NA
## 1881          k          B          M    Millenial   Zachary NA
## 1882          k          B          M    Millenial     Dylan NA
## 1883          k          B          M    Millenial Christian NA
## 1884          k          B          M    Millenial    Wesley NA
## 1885          k          B          M    Millenial      Seth NA
## 1886          k          B          M    Millenial    Austin NA
## 1887          k          B          M    Millenial   Gabriel NA
## 1888          k          B          M    Millenial      Evan NA
## 1889          k          B          M    Millenial     Casey NA
## 1890          k          B          M    Millenial      Luis NA
## 1891          k          B          F       Boomer    Gloria NA
## 1892          k          B          F       Boomer      Joan NA
## 1893          k          B          F       Boomer   Dorothy NA
## 1894          k          B          F       Boomer   Shirley NA
## 1895          k          B          F       Boomer     Betty NA
## 1896          k          B          F       Boomer    Dianne NA
## 1897          k          B          F       Boomer       Kay NA
## 1898          k          B          F       Boomer  Marjorie NA
## 1899          k          B          F       Boomer  Lorraine NA
## 1900          k          B          F       Boomer   Mildred NA
## 1901          k          B          F         GenX     Tracy NA
## 1902          k          B          F         GenX      Dawn NA
## 1903          k          B          F         GenX      Tina NA
## 1904          k          B          F         GenX     Tammy NA
## 1905          k          B          F         GenX   Melinda NA
## 1906          k          B          F         GenX    Tamara NA
## 1907          k          B          F         GenX    Tracey NA
## 1908          k          B          F         GenX   Colleen NA
## 1909          k          B          F         GenX    Sherri NA
## 1910          k          B          F         GenX     Heidi NA
## 1911          k          B          F    Millenial  Samantha NA
## 1912          k          B          F    Millenial    Alexis NA
## 1913          k          B          F    Millenial   Brittany NA
## 1914          k          B          F    Millenial    Lauren NA
## 1915          k          B          F    Millenial    Taylor NA
## 1916          k          B          F    Millenial   Bethany NA
```

```
## 1917          k          B          F    Millenial      Latoya NA
## 1918          k          B          F    Millenial     Candice NA
## 1919          k          B          F    Millenial    Brittney NA
## 1920          k          B          F    Millenial    Cheyenne NA
## 1921          k          C          M       Boomer    Theodore NA
## 1922          k          C          M       Boomer     Bernard NA
## 1923          k          C          M       Boomer        Gene NA
## 1924          k          C          M       Boomer     Herbert NA
## 1925          k          C          M       Boomer         Ray NA
## 1926          k          C          M       Boomer         Tom NA
## 1927          k          C          M       Boomer         Lee NA
## 1928          k          C          M       Boomer      Alfred NA
## 1929          k          C          M       Boomer       Leroy NA
## 1930          k          C          M       Boomer       Eddie NA
## 1931          k          C          M         GenX        Marc NA
## 1932          k          C          M         GenX       Jamie NA
## 1933          k          C          M         GenX        Greg NA
## 1934          k          C          M         GenX      Darryl NA
## 1935          k          C          M         GenX         Tim NA
## 1936          k          C          M         GenX        Dean NA
## 1937          k          C          M         GenX         Jon NA
## 1938          k          C          M         GenX       Chris NA
## 1939          k          C          M         GenX        Troy NA
## 1940          k          C          M         GenX        Jeff NA
## 1941          k          C          M    Millenial     Zachary NA
## 1942          k          C          M    Millenial       Dylan NA
## 1943          k          C          M    Millenial   Christian NA
## 1944          k          C          M    Millenial      Wesley NA
## 1945          k          C          M    Millenial        Seth NA
## 1946          k          C          M    Millenial      Austin NA
## 1947          k          C          M    Millenial     Gabriel NA
## 1948          k          C          M    Millenial        Evan NA
## 1949          k          C          M    Millenial       Casey NA
## 1950          k          C          M    Millenial        Luis NA
## 1951          k          C          F       Boomer      Gloria NA
## 1952          k          C          F       Boomer        Joan NA
## 1953          k          C          F       Boomer     Dorothy NA
## 1954          k          C          F       Boomer     Shirley NA
## 1955          k          C          F       Boomer       Betty NA
## 1956          k          C          F       Boomer      Dianne NA
## 1957          k          C          F       Boomer         Kay NA
## 1958          k          C          F       Boomer    Marjorie NA
## 1959          k          C          F       Boomer    Lorraine NA
## 1960          k          C          F       Boomer     Mildred NA
## 1961          k          C          F         GenX       Tracy NA
## 1962          k          C          F         GenX        Dawn NA
## 1963          k          C          F         GenX        Tina NA
## 1964          k          C          F         GenX       Tammy NA
## 1965          k          C          F         GenX     Melinda NA
## 1966          k          C          F         GenX      Tamara NA
## 1967          k          C          F         GenX      Tracey NA
## 1968          k          C          F         GenX     Colleen NA
## 1969          k          C          F         GenX      Sherri NA
## 1970          k          C          F         GenX       Heidi NA
```

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## 1971           k         C         F   Millenial  Samantha NA
## 1972           k         C         F   Millenial    Alexis NA
## 1973           k         C         F   Millenial  Brittany NA
## 1974           k         C         F   Millenial    Lauren NA
## 1975           k         C         F   Millenial    Taylor NA
## 1976           k         C         F   Millenial   Bethany NA
## 1977           k         C         F   Millenial    Latoya NA
## 1978           k         C         F   Millenial   Candice NA
## 1979           k         C         F   Millenial   Brittney NA
## 1980           k         C         F   Millenial  Cheyenne NA
## 1981           l         A         M      Boomer  Theodore NA
## 1982           l         A         M      Boomer   Bernard NA
## 1983           l         A         M      Boomer      Gene NA
## 1984           l         A         M      Boomer   Herbert NA
## 1985           l         A         M      Boomer       Ray NA
## 1986           l         A         M      Boomer       Tom NA
## 1987           l         A         M      Boomer       Lee NA
## 1988           l         A         M      Boomer    Alfred NA
## 1989           l         A         M      Boomer     Leroy NA
## 1990           l         A         M      Boomer     Eddie NA
## 1991           l         A         M        GenX      Marc NA
## 1992           l         A         M        GenX     Jamie NA
## 1993           l         A         M        GenX      Greg NA
## 1994           l         A         M        GenX    Darryl NA
## 1995           l         A         M        GenX       Tim NA
## 1996           l         A         M        GenX      Dean NA
## 1997           l         A         M        GenX       Jon NA
## 1998           l         A         M        GenX     Chris NA
## 1999           l         A         M        GenX      Troy NA
## 2000           l         A         M        GenX      Jeff NA
## 2001           l         A         M   Millenial   Zachary NA
## 2002           l         A         M   Millenial     Dylan NA
## 2003           l         A         M   Millenial Christian NA
## 2004           l         A         M   Millenial    Wesley NA
## 2005           l         A         M   Millenial      Seth NA
## 2006           l         A         M   Millenial    Austin NA
## 2007           l         A         M   Millenial   Gabriel NA
## 2008           l         A         M   Millenial      Evan NA
## 2009           l         A         M   Millenial     Casey NA
## 2010           l         A         M   Millenial      Luis NA
## 2011           l         A         F      Boomer    Gloria NA
## 2012           l         A         F      Boomer      Joan NA
## 2013           l         A         F      Boomer   Dorothy NA
## 2014           l         A         F      Boomer   Shirley NA
## 2015           l         A         F      Boomer     Betty NA
## 2016           l         A         F      Boomer    Dianne NA
## 2017           l         A         F      Boomer       Kay NA
## 2018           l         A         F      Boomer  Marjorie NA
## 2019           l         A         F      Boomer  Lorraine NA
## 2020           l         A         F      Boomer   Mildred NA
## 2021           l         A         F        GenX     Tracy NA
## 2022           l         A         F        GenX      Dawn NA
## 2023           l         A         F        GenX      Tina NA
## 2024           l         A         F        GenX     Tammy NA
```

```
## 2025        l        A        F        GenX      Melinda NA
## 2026        l        A        F        GenX       Tamara NA
## 2027        l        A        F        GenX       Tracey NA
## 2028        l        A        F        GenX      Colleen NA
## 2029        l        A        F        GenX       Sherri NA
## 2030        l        A        F        GenX        Heidi NA
## 2031        l        A        F    Millenial     Samantha NA
## 2032        l        A        F    Millenial       Alexis NA
## 2033        l        A        F    Millenial     Brittany NA
## 2034        l        A        F    Millenial       Lauren NA
## 2035        l        A        F    Millenial       Taylor NA
## 2036        l        A        F    Millenial      Bethany NA
## 2037        l        A        F    Millenial       Latoya NA
## 2038        l        A        F    Millenial      Candice NA
## 2039        l        A        F    Millenial     Brittney NA
## 2040        l        A        F    Millenial     Cheyenne NA
## 2041        l        B        M       Boomer     Theodore NA
## 2042        l        B        M       Boomer      Bernard NA
## 2043        l        B        M       Boomer         Gene NA
## 2044        l        B        M       Boomer      Herbert NA
## 2045        l        B        M       Boomer          Ray NA
## 2046        l        B        M       Boomer          Tom NA
## 2047        l        B        M       Boomer          Lee NA
## 2048        l        B        M       Boomer       Alfred NA
## 2049        l        B        M       Boomer        Leroy NA
## 2050        l        B        M       Boomer        Eddie NA
## 2051        l        B        M        GenX         Marc NA
## 2052        l        B        M        GenX        Jamie NA
## 2053        l        B        M        GenX         Greg NA
## 2054        l        B        M        GenX       Darryl NA
## 2055        l        B        M        GenX          Tim NA
## 2056        l        B        M        GenX         Dean NA
## 2057        l        B        M        GenX          Jon NA
## 2058        l        B        M        GenX        Chris NA
## 2059        l        B        M        GenX         Troy NA
## 2060        l        B        M        GenX         Jeff NA
## 2061        l        B        M    Millenial      Zachary NA
## 2062        l        B        M    Millenial        Dylan NA
## 2063        l        B        M    Millenial    Christian NA
## 2064        l        B        M    Millenial       Wesley NA
## 2065        l        B        M    Millenial         Seth NA
## 2066        l        B        M    Millenial       Austin NA
## 2067        l        B        M    Millenial       Gabriel NA
## 2068        l        B        M    Millenial         Evan NA
## 2069        l        B        M    Millenial        Casey NA
## 2070        l        B        M    Millenial         Luis NA
## 2071        l        B        F       Boomer       Gloria NA
## 2072        l        B        F       Boomer         Joan NA
## 2073        l        B        F       Boomer      Dorothy NA
## 2074        l        B        F       Boomer      Shirley NA
## 2075        l        B        F       Boomer        Betty NA
## 2076        l        B        F       Boomer       Dianne NA
## 2077        l        B        F       Boomer          Kay NA
## 2078        l        B        F       Boomer      Marjorie NA
```

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## 2079           l           B           F       Boomer    Lorraine NA
## 2080           l           B           F       Boomer     Mildred NA
## 2081           l           B           F         GenX       Tracy NA
## 2082           l           B           F         GenX        Dawn NA
## 2083           l           B           F         GenX        Tina NA
## 2084           l           B           F         GenX       Tammy NA
## 2085           l           B           F         GenX     Melinda NA
## 2086           l           B           F         GenX      Tamara NA
## 2087           l           B           F         GenX      Tracey NA
## 2088           l           B           F         GenX     Colleen NA
## 2089           l           B           F         GenX      Sherri NA
## 2090           l           B           F         GenX       Heidi NA
## 2091           l           B           F    Millenial    Samantha NA
## 2092           l           B           F    Millenial      Alexis NA
## 2093           l           B           F    Millenial     Brittany NA
## 2094           l           B           F    Millenial      Lauren NA
## 2095           l           B           F    Millenial       Taylor NA
## 2096           l           B           F    Millenial      Bethany NA
## 2097           l           B           F    Millenial      Latoya NA
## 2098           l           B           F    Millenial      Candice NA
## 2099           l           B           F    Millenial      Brittney NA
## 2100           l           B           F    Millenial     Cheyenne NA
## 2101           l           C           M       Boomer     Theodore NA
## 2102           l           C           M       Boomer      Bernard NA
## 2103           l           C           M       Boomer         Gene NA
## 2104           l           C           M       Boomer      Herbert NA
## 2105           l           C           M       Boomer          Ray NA
## 2106           l           C           M       Boomer          Tom NA
## 2107           l           C           M       Boomer          Lee NA
## 2108           l           C           M       Boomer       Alfred NA
## 2109           l           C           M       Boomer        Leroy NA
## 2110           l           C           M       Boomer        Eddie NA
## 2111           l           C           M         GenX         Marc NA
## 2112           l           C           M         GenX        Jamie NA
## 2113           l           C           M         GenX         Greg NA
## 2114           l           C           M         GenX       Darryl NA
## 2115           l           C           M         GenX          Tim NA
## 2116           l           C           M         GenX         Dean NA
## 2117           l           C           M         GenX          Jon NA
## 2118           l           C           M         GenX        Chris NA
## 2119           l           C           M         GenX         Troy NA
## 2120           l           C           M         GenX         Jeff NA
## 2121           l           C           M    Millenial      Zachary NA
## 2122           l           C           M    Millenial        Dylan NA
## 2123           l           C           M    Millenial    Christian NA
## 2124           l           C           M    Millenial       Wesley NA
## 2125           l           C           M    Millenial         Seth NA
## 2126           l           C           M    Millenial       Austin NA
## 2127           l           C           M    Millenial      Gabriel NA
## 2128           l           C           M    Millenial         Evan NA
## 2129           l           C           M    Millenial        Casey NA
## 2130           l           C           M    Millenial         Luis NA
## 2131           l           C           F       Boomer       Gloria NA
## 2132           l           C           F       Boomer         Joan NA
```

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## 2133            l         C       F      Boomer    Dorothy NA
## 2134            l         C       F      Boomer    Shirley NA
## 2135            l         C       F      Boomer      Betty NA
## 2136            l         C       F      Boomer     Dianne NA
## 2137            l         C       F      Boomer        Kay NA
## 2138            l         C       F      Boomer    Marjorie NA
## 2139            l         C       F      Boomer    Lorraine NA
## 2140            l         C       F      Boomer     Mildred NA
## 2141            l         C       F        GenX      Tracy NA
## 2142            l         C       F        GenX       Dawn NA
## 2143            l         C       F        GenX       Tina NA
## 2144            l         C       F        GenX      Tammy NA
## 2145            l         C       F        GenX     Melinda NA
## 2146            l         C       F        GenX      Tamara NA
## 2147            l         C       F        GenX      Tracey NA
## 2148            l         C       F        GenX     Colleen NA
## 2149            l         C       F        GenX      Sherri NA
## 2150            l         C       F        GenX       Heidi NA
## 2151            l         C       F   Millenial   Samantha NA
## 2152            l         C       F   Millenial     Alexis NA
## 2153            l         C       F   Millenial    Brittany NA
## 2154            l         C       F   Millenial      Lauren NA
## 2155            l         C       F   Millenial      Taylor NA
## 2156            l         C       F   Millenial     Bethany NA
## 2157            l         C       F   Millenial      Latoya NA
## 2158            l         C       F   Millenial     Candice NA
## 2159            l         C       F   Millenial    Brittney NA
## 2160            l         C       F   Millenial    Cheyenne NA
## 2161            m         A       M      Boomer    Theodore NA
## 2162            m         A       M      Boomer     Bernard NA
## 2163            m         A       M      Boomer        Gene NA
## 2164            m         A       M      Boomer     Herbert NA
## 2165            m         A       M      Boomer         Ray NA
## 2166            m         A       M      Boomer         Tom NA
## 2167            m         A       M      Boomer         Lee NA
## 2168            m         A       M      Boomer      Alfred NA
## 2169            m         A       M      Boomer       Leroy NA
## 2170            m         A       M      Boomer       Eddie NA
## 2171            m         A       M        GenX        Marc NA
## 2172            m         A       M        GenX       Jamie NA
## 2173            m         A       M        GenX        Greg NA
## 2174            m         A       M        GenX      Darryl NA
## 2175            m         A       M        GenX         Tim NA
## 2176            m         A       M        GenX        Dean NA
## 2177            m         A       M        GenX         Jon NA
## 2178            m         A       M        GenX       Chris NA
## 2179            m         A       M        GenX        Troy NA
## 2180            m         A       M        GenX        Jeff NA
## 2181            m         A       M   Millenial     Zachary NA
## 2182            m         A       M   Millenial       Dylan NA
## 2183            m         A       M   Millenial   Christian NA
## 2184            m         A       M   Millenial      Wesley NA
## 2185            m         A       M   Millenial        Seth NA
## 2186            m         A       M   Millenial      Austin NA
```

```
## 2187          m          A          M   Millenial     Gabriel NA
## 2188          m          A          M   Millenial        Evan NA
## 2189          m          A          M   Millenial       Casey NA
## 2190          m          A          M   Millenial        Luis NA
## 2191          m          A          F      Boomer      Gloria NA
## 2192          m          A          F      Boomer        Joan NA
## 2193          m          A          F      Boomer     Dorothy NA
## 2194          m          A          F      Boomer     Shirley NA
## 2195          m          A          F      Boomer       Betty NA
## 2196          m          A          F      Boomer      Dianne NA
## 2197          m          A          F      Boomer         Kay NA
## 2198          m          A          F      Boomer     Marjorie NA
## 2199          m          A          F      Boomer     Lorraine NA
## 2200          m          A          F      Boomer     Mildred NA
## 2201          m          A          F        GenX       Tracy NA
## 2202          m          A          F        GenX        Dawn NA
## 2203          m          A          F        GenX        Tina NA
## 2204          m          A          F        GenX       Tammy NA
## 2205          m          A          F        GenX     Melinda NA
## 2206          m          A          F        GenX      Tamara NA
## 2207          m          A          F        GenX      Tracey NA
## 2208          m          A          F        GenX     Colleen NA
## 2209          m          A          F        GenX       Sherri NA
## 2210          m          A          F        GenX        Heidi NA
## 2211          m          A          F   Millenial    Samantha NA
## 2212          m          A          F   Millenial      Alexis NA
## 2213          m          A          F   Millenial     Brittany NA
## 2214          m          A          F   Millenial      Lauren NA
## 2215          m          A          F   Millenial       Taylor NA
## 2216          m          A          F   Millenial     Bethany NA
## 2217          m          A          F   Millenial       Latoya NA
## 2218          m          A          F   Millenial      Candice NA
## 2219          m          A          F   Millenial     Brittney NA
## 2220          m          A          F   Millenial     Cheyenne NA
## 2221          m          B          M      Boomer     Theodore NA
## 2222          m          B          M      Boomer      Bernard NA
## 2223          m          B          M      Boomer         Gene NA
## 2224          m          B          M      Boomer      Herbert NA
## 2225          m          B          M      Boomer          Ray NA
## 2226          m          B          M      Boomer          Tom NA
## 2227          m          B          M      Boomer          Lee NA
## 2228          m          B          M      Boomer       Alfred NA
## 2229          m          B          M      Boomer        Leroy NA
## 2230          m          B          M      Boomer        Eddie NA
## 2231          m          B          M        GenX         Marc NA
## 2232          m          B          M        GenX        Jamie NA
## 2233          m          B          M        GenX         Greg NA
## 2234          m          B          M        GenX       Darryl NA
## 2235          m          B          M        GenX          Tim NA
## 2236          m          B          M        GenX         Dean NA
## 2237          m          B          M        GenX          Jon NA
## 2238          m          B          M        GenX        Chris NA
## 2239          m          B          M        GenX         Troy NA
## 2240          m          B          M        GenX         Jeff NA
```

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## 2241        m         B    M  Millenial    Zachary NA
## 2242        m         B    M  Millenial      Dylan NA
## 2243        m         B    M  Millenial  Christian NA
## 2244        m         B    M  Millenial     Wesley NA
## 2245        m         B    M  Millenial       Seth NA
## 2246        m         B    M  Millenial     Austin NA
## 2247        m         B    M  Millenial     Gabriel NA
## 2248        m         B    M  Millenial       Evan NA
## 2249        m         B    M  Millenial      Casey NA
## 2250        m         B    M  Millenial       Luis NA
## 2251        m         B    F     Boomer     Gloria NA
## 2252        m         B    F     Boomer       Joan NA
## 2253        m         B    F     Boomer     Dorothy NA
## 2254        m         B    F     Boomer     Shirley NA
## 2255        m         B    F     Boomer      Betty NA
## 2256        m         B    F     Boomer     Dianne NA
## 2257        m         B    F     Boomer        Kay NA
## 2258        m         B    F     Boomer    Marjorie NA
## 2259        m         B    F     Boomer    Lorraine NA
## 2260        m         B    F     Boomer     Mildred NA
## 2261        m         B    F       GenX      Tracy NA
## 2262        m         B    F       GenX       Dawn NA
## 2263        m         B    F       GenX       Tina NA
## 2264        m         B    F       GenX      Tammy NA
## 2265        m         B    F       GenX     Melinda NA
## 2266        m         B    F       GenX     Tamara NA
## 2267        m         B    F       GenX     Tracey NA
## 2268        m         B    F       GenX     Colleen NA
## 2269        m         B    F       GenX     Sherri NA
## 2270        m         B    F       GenX      Heidi NA
## 2271        m         B    F  Millenial   Samantha NA
## 2272        m         B    F  Millenial     Alexis NA
## 2273        m         B    F  Millenial    Brittany NA
## 2274        m         B    F  Millenial     Lauren NA
## 2275        m         B    F  Millenial     Taylor NA
## 2276        m         B    F  Millenial    Bethany NA
## 2277        m         B    F  Millenial     Latoya NA
## 2278        m         B    F  Millenial     Candice NA
## 2279        m         B    F  Millenial    Brittney NA
## 2280        m         B    F  Millenial    Cheyenne NA
## 2281        m         C    M     Boomer    Theodore NA
## 2282        m         C    M     Boomer     Bernard NA
## 2283        m         C    M     Boomer       Gene NA
## 2284        m         C    M     Boomer     Herbert NA
## 2285        m         C    M     Boomer        Ray NA
## 2286        m         C    M     Boomer        Tom NA
## 2287        m         C    M     Boomer        Lee NA
## 2288        m         C    M     Boomer     Alfred NA
## 2289        m         C    M     Boomer      Leroy NA
## 2290        m         C    M     Boomer      Eddie NA
## 2291        m         C    M       GenX       Marc NA
## 2292        m         C    M       GenX      Jamie NA
## 2293        m         C    M       GenX       Greg NA
## 2294        m         C    M       GenX     Darryl NA
```

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## 2295            m        C        M       GenX        Tim NA
## 2296            m        C        M       GenX       Dean NA
## 2297            m        C        M       GenX        Jon NA
## 2298            m        C        M       GenX       Chris NA
## 2299            m        C        M       GenX       Troy NA
## 2300            m        C        M       GenX       Jeff NA
## 2301            m        C        M   Millenial    Zachary NA
## 2302            m        C        M   Millenial      Dylan NA
## 2303            m        C        M   Millenial  Christian NA
## 2304            m        C        M   Millenial     Wesley NA
## 2305            m        C        M   Millenial       Seth NA
## 2306            m        C        M   Millenial     Austin NA
## 2307            m        C        M   Millenial    Gabriel NA
## 2308            m        C        M   Millenial       Evan NA
## 2309            m        C        M   Millenial      Casey NA
## 2310            m        C        M   Millenial       Luis NA
## 2311            m        C        F      Boomer     Gloria NA
## 2312            m        C        F      Boomer       Joan NA
## 2313            m        C        F      Boomer    Dorothy NA
## 2314            m        C        F      Boomer    Shirley NA
## 2315            m        C        F      Boomer      Betty NA
## 2316            m        C        F      Boomer     Dianne NA
## 2317            m        C        F      Boomer        Kay NA
## 2318            m        C        F      Boomer   Marjorie NA
## 2319            m        C        F      Boomer    Lorraine NA
## 2320            m        C        F      Boomer     Mildred NA
## 2321            m        C        F        GenX      Tracy NA
## 2322            m        C        F        GenX       Dawn NA
## 2323            m        C        F        GenX       Tina NA
## 2324            m        C        F        GenX      Tammy NA
## 2325            m        C        F        GenX    Melinda NA
## 2326            m        C        F        GenX     Tamara NA
## 2327            m        C        F        GenX     Tracey NA
## 2328            m        C        F        GenX    Colleen NA
## 2329            m        C        F        GenX     Sherri NA
## 2330            m        C        F        GenX      Heidi NA
## 2331            m        C        F   Millenial   Samantha NA
## 2332            m        C        F   Millenial     Alexis NA
## 2333            m        C        F   Millenial    Brittany NA
## 2334            m        C        F   Millenial     Lauren NA
## 2335            m        C        F   Millenial      Taylor NA
## 2336            m        C        F   Millenial     Bethany NA
## 2337            m        C        F   Millenial      Latoya NA
## 2338            m        C        F   Millenial     Candice NA
## 2339            m        C        F   Millenial     Brittney NA
## 2340            m        C        F   Millenial     Cheyenne NA
## 2341            n        A        M      Boomer    Theodore NA
## 2342            n        A        M      Boomer     Bernard NA
## 2343            n        A        M      Boomer        Gene NA
## 2344            n        A        M      Boomer     Herbert NA
## 2345            n        A        M      Boomer         Ray NA
## 2346            n        A        M      Boomer         Tom NA
## 2347            n        A        M      Boomer         Lee NA
## 2348            n        A        M      Boomer      Alfred NA
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## 2349            n          A          M        Boomer      Leroy NA
## 2350            n          A          M        Boomer      Eddie NA
## 2351            n          A          M          GenX       Marc NA
## 2352            n          A          M          GenX      Jamie NA
## 2353            n          A          M          GenX       Greg NA
## 2354            n          A          M          GenX     Darryl NA
## 2355            n          A          M          GenX        Tim NA
## 2356            n          A          M          GenX       Dean NA
## 2357            n          A          M          GenX        Jon NA
## 2358            n          A          M          GenX      Chris NA
## 2359            n          A          M          GenX       Troy NA
## 2360            n          A          M          GenX       Jeff NA
## 2361            n          A          M     Millenial    Zachary NA
## 2362            n          A          M     Millenial      Dylan NA
## 2363            n          A          M     Millenial  Christian NA
## 2364            n          A          M     Millenial     Wesley NA
## 2365            n          A          M     Millenial       Seth NA
## 2366            n          A          M     Millenial     Austin NA
## 2367            n          A          M     Millenial    Gabriel NA
## 2368            n          A          M     Millenial       Evan NA
## 2369            n          A          M     Millenial      Casey NA
## 2370            n          A          M     Millenial       Luis NA
## 2371            n          A          F        Boomer     Gloria NA
## 2372            n          A          F        Boomer       Joan NA
## 2373            n          A          F        Boomer    Dorothy NA
## 2374            n          A          F        Boomer    Shirley NA
## 2375            n          A          F        Boomer      Betty NA
## 2376            n          A          F        Boomer     Dianne NA
## 2377            n          A          F        Boomer        Kay NA
## 2378            n          A          F        Boomer   Marjorie NA
## 2379            n          A          F        Boomer   Lorraine NA
## 2380            n          A          F        Boomer    Mildred NA
## 2381            n          A          F          GenX      Tracy NA
## 2382            n          A          F          GenX       Dawn NA
## 2383            n          A          F          GenX       Tina NA
## 2384            n          A          F          GenX      Tammy NA
## 2385            n          A          F          GenX    Melinda NA
## 2386            n          A          F          GenX     Tamara NA
## 2387            n          A          F          GenX     Tracey NA
## 2388            n          A          F          GenX    Colleen NA
## 2389            n          A          F          GenX     Sherri NA
## 2390            n          A          F          GenX      Heidi NA
## 2391            n          A          F     Millenial   Samantha NA
## 2392            n          A          F     Millenial     Alexis NA
## 2393            n          A          F     Millenial   Brittany NA
## 2394            n          A          F     Millenial     Lauren NA
## 2395            n          A          F     Millenial     Taylor NA
## 2396            n          A          F     Millenial    Bethany NA
## 2397            n          A          F     Millenial     Latoya NA
## 2398            n          A          F     Millenial    Candice NA
## 2399            n          A          F     Millenial   Brittney NA
## 2400            n          A          F     Millenial   Cheyenne NA
## 2401            n          B          M        Boomer   Theodore NA
## 2402            n          B          M        Boomer    Bernard NA
```

```
## 2403          n          B          M        Boomer        Gene NA
## 2404          n          B          M        Boomer     Herbert NA
## 2405          n          B          M        Boomer         Ray NA
## 2406          n          B          M        Boomer         Tom NA
## 2407          n          B          M        Boomer         Lee NA
## 2408          n          B          M        Boomer      Alfred NA
## 2409          n          B          M        Boomer       Leroy NA
## 2410          n          B          M        Boomer       Eddie NA
## 2411          n          B          M          GenX        Marc NA
## 2412          n          B          M          GenX       Jamie NA
## 2413          n          B          M          GenX        Greg NA
## 2414          n          B          M          GenX      Darryl NA
## 2415          n          B          M          GenX         Tim NA
## 2416          n          B          M          GenX        Dean NA
## 2417          n          B          M          GenX         Jon NA
## 2418          n          B          M          GenX       Chris NA
## 2419          n          B          M          GenX        Troy NA
## 2420          n          B          M          GenX        Jeff NA
## 2421          n          B          M     Millenial     Zachary NA
## 2422          n          B          M     Millenial       Dylan NA
## 2423          n          B          M     Millenial   Christian NA
## 2424          n          B          M     Millenial      Wesley NA
## 2425          n          B          M     Millenial        Seth NA
## 2426          n          B          M     Millenial      Austin NA
## 2427          n          B          M     Millenial     Gabriel NA
## 2428          n          B          M     Millenial        Evan NA
## 2429          n          B          M     Millenial       Casey NA
## 2430          n          B          M     Millenial        Luis NA
## 2431          n          B          F        Boomer      Gloria NA
## 2432          n          B          F        Boomer        Joan NA
## 2433          n          B          F        Boomer     Dorothy NA
## 2434          n          B          F        Boomer     Shirley NA
## 2435          n          B          F        Boomer       Betty NA
## 2436          n          B          F        Boomer      Dianne NA
## 2437          n          B          F        Boomer         Kay NA
## 2438          n          B          F        Boomer    Marjorie NA
## 2439          n          B          F        Boomer     Lorraine NA
## 2440          n          B          F        Boomer     Mildred NA
## 2441          n          B          F          GenX       Tracy NA
## 2442          n          B          F          GenX        Dawn NA
## 2443          n          B          F          GenX        Tina NA
## 2444          n          B          F          GenX       Tammy NA
## 2445          n          B          F          GenX     Melinda NA
## 2446          n          B          F          GenX      Tamara NA
## 2447          n          B          F          GenX      Tracey NA
## 2448          n          B          F          GenX     Colleen NA
## 2449          n          B          F          GenX      Sherri NA
## 2450          n          B          F          GenX       Heidi NA
## 2451          n          B          F     Millenial    Samantha NA
## 2452          n          B          F     Millenial      Alexis NA
## 2453          n          B          F     Millenial     Brittany NA
## 2454          n          B          F     Millenial      Lauren NA
## 2455          n          B          F     Millenial      Taylor NA
## 2456          n          B          F     Millenial     Bethany NA
```

```
## 2457          n          B          F   Millenial     Latoya NA
## 2458          n          B          F   Millenial    Candice NA
## 2459          n          B          F   Millenial   Brittney NA
## 2460          n          B          F   Millenial   Cheyenne NA
## 2461          n          C          M      Boomer   Theodore NA
## 2462          n          C          M      Boomer    Bernard NA
## 2463          n          C          M      Boomer       Gene NA
## 2464          n          C          M      Boomer    Herbert NA
## 2465          n          C          M      Boomer        Ray NA
## 2466          n          C          M      Boomer        Tom NA
## 2467          n          C          M      Boomer        Lee NA
## 2468          n          C          M      Boomer     Alfred NA
## 2469          n          C          M      Boomer      Leroy NA
## 2470          n          C          M      Boomer      Eddie NA
## 2471          n          C          M        GenX       Marc NA
## 2472          n          C          M        GenX      Jamie NA
## 2473          n          C          M        GenX       Greg NA
## 2474          n          C          M        GenX     Darryl NA
## 2475          n          C          M        GenX        Tim NA
## 2476          n          C          M        GenX       Dean NA
## 2477          n          C          M        GenX        Jon NA
## 2478          n          C          M        GenX      Chris NA
## 2479          n          C          M        GenX       Troy NA
## 2480          n          C          M        GenX       Jeff NA
## 2481          n          C          M   Millenial    Zachary NA
## 2482          n          C          M   Millenial      Dylan NA
## 2483          n          C          M   Millenial  Christian NA
## 2484          n          C          M   Millenial     Wesley NA
## 2485          n          C          M   Millenial       Seth NA
## 2486          n          C          M   Millenial     Austin NA
## 2487          n          C          M   Millenial    Gabriel NA
## 2488          n          C          M   Millenial       Evan NA
## 2489          n          C          M   Millenial      Casey NA
## 2490          n          C          M   Millenial       Luis NA
## 2491          n          C          F      Boomer     Gloria NA
## 2492          n          C          F      Boomer       Joan NA
## 2493          n          C          F      Boomer    Dorothy NA
## 2494          n          C          F      Boomer    Shirley NA
## 2495          n          C          F      Boomer      Betty NA
## 2496          n          C          F      Boomer     Dianne NA
## 2497          n          C          F      Boomer        Kay NA
## 2498          n          C          F      Boomer   Marjorie NA
## 2499          n          C          F      Boomer   Lorraine NA
## 2500          n          C          F      Boomer    Mildred NA
## 2501          n          C          F        GenX      Tracy NA
## 2502          n          C          F        GenX       Dawn NA
## 2503          n          C          F        GenX       Tina NA
## 2504          n          C          F        GenX      Tammy NA
## 2505          n          C          F        GenX    Melinda NA
## 2506          n          C          F        GenX     Tamara NA
## 2507          n          C          F        GenX     Tracey NA
## 2508          n          C          F        GenX    Colleen NA
## 2509          n          C          F        GenX     Sherri NA
## 2510          n          C          F        GenX       Heidi NA
```

```
## 2511          n         C      F  Millenial  Samantha NA
## 2512          n         C      F  Millenial    Alexis NA
## 2513          n         C      F  Millenial  Brittany NA
## 2514          n         C      F  Millenial    Lauren NA
## 2515          n         C      F  Millenial    Taylor NA
## 2516          n         C      F  Millenial   Bethany NA
## 2517          n         C      F  Millenial    Latoya NA
## 2518          n         C      F  Millenial   Candice NA
## 2519          n         C      F  Millenial  Brittney NA
## 2520          n         C      F  Millenial  Cheyenne NA
```

Packages

Install the package `pacman` using regular base R.

`{r: eval= FALSE} install.packages("pacman")`

First, install the package `testthat` (a widely accepted testing suite for R) from https://github.com/r-lib/testthat using `pacman`. If you are using Windows, this will be a long install, but you have to go through it for some of the stuff we are doing in class. LINUX (or MAC) is preferred for coding. If you can't get it to work, install this package from CRAN (still using `pacman`), but this is not recommended long term.

```
pacman::p_load(testthat)
```

- Create vector v consisting of all numbers from -100 to 100 and test using the second line of code su

```
v= seq(-100, 100)
expect_equal(v, -100 : 101)
```

If there are any errors, the `expect_equal` function will tell you about them. If there are no errors, then it will be silent.

Test the `my_reverse` function from lab2 using the following code:

```
v = 1:100
expect_equal(my_reverse(v), rev(v))
expect_equal(my_reverse(c("A", "B", "C")), c("C", "B", "A"))
#Nothing should output
```

Multinomial Classification using KNN

Write a $k = 1$ nearest neighbor algorithm using the Euclidean distance function. This is standard "Roxygen" format for documentation. Hopefully, we will get to packages at some point and we will go over this again. It is your job also to fill in this documentation.

```
#' One nearest neighbor classifier
#'
#' classify an observation based on the label of the closest observation in a set of training observati
#'
#' @param Xinput      A matrix of observed features i.e. training data
#' @param y_binary    The vector of training data labels.
#' @param xtest       A test observation as a row vector
#' @return            The predicted label for the test observation
nn_algorithm_predict = function(Xinput, y_binary, xtest){
  n=nrow(Xinput)
  distances=array(NA,n)
  for(i in 1:n){
    distances[i]=sum((Xinput[i, ]-xtest)^2)
```

```
  }
  y_binary[which.min(distances)]
}
data(iris)

ra_species = iris
ra_species$Species = NULL  # remove species column for xinput parameter
Xinput = ra_species
y_binary = iris$Species  #
xtest = c(6.3, 3.2, 4.0, 1.1) # test data
xtest
```

```
## [1] 6.3 3.2 4.0 1.1
```

```
nn_algorithm_predict(Xinput, y_binary, xtest)
```

```
## [1] versicolor
## Levels: setosa versicolor virginica
```

Write a few tests to ensure it actually works:

```
xtest = c(5.2, 4.0, 3.2, 1.0)
nn_algorithm_predict(Xinput, y_binary, xtest)
```

```
## [1] versicolor
## Levels: setosa versicolor virginica
```

```
xtest = c(6.2, 4.4, 3.7, 1.3)
nn_algorithm_predict(Xinput, y_binary, xtest)
```

```
## [1] versicolor
## Levels: setosa versicolor virginica
```

We now add an argument `d` representing any legal distance function to the `nn_algorithm_predict` function. Update the implementation so it performs NN using that distance function. Set the default function to be the Euclidean distance in the original function. Also, alter the documentation in the appropriate places.

```
#' One nearest neighbor classifier
#'
#' classify an observation based on the label of the closest observation in a set of training observati
#'
#' @param Xinput      A matrix of observed features i.e. training data
#' @param y_binary    The vector of training data labels.
#' @param xtest       A test observation as a row vector
#' @param d           A distance function which take inputs to different row vectors
#' @return            The predicted label for the test observation
nn_algorithm_predict = function(Xinput, y_binary, xtest, d=function(v1,v2){sum((v1-v2)^2)}){
  n=nrow(Xinput)
  distances=array(NA,n)
  for(i in 1:n){
    distances[i]=d(Xinput[i,],xtest)
  }
  y_binary[which.min(distances)]
}
```

For extra credit (unless you're a masters student), add an argument `k` to the `nn_algorithm_predict` function and update the implementation so it performs KNN. In the case of a tie, choose $\hat{y}$ randomly. Set the default `k` to be the square root of the size of $\mathcal{D}$ which is an empirical rule-of-thumb popularized by the "Pattern

Classification" book by Duda, Hart and Stork (2007). Also, alter the documentation in the appropriate places.

```
#' KNN Euclidean Distance
#'
#' Assumes similarity between the new data and available data. A data point is classified based on the
#'
#' @param Xinput      A matrix of observed features i.e. training data
#' @param y_binary    A vector of training data labels
#' @param xtest       A test observation as a row vector
#' @param k           The number of neighbors to consider when classifying a data point
#' @return            The prediction label for the test observation

nn_algorithm_predict = function(Xinput, y_binary, xtest, k=1){
  n <- nrow(Xinput)
  distance <- array(NA, n)
  for(i in 1:n) {
    distance[i] <- sum(Xinput[i,] - xtest)^2
  }

  # Create a list of the nearest k neighbors
  nearest_neighbors = array(NA, k)
  for(j in 1:k) {
    nearest_neighbors[j] = which.min(distance[j])

  }

  # Find mode of the nearest_neighbords
  sorted_counts <- sort(nearest_neighbors, decreasing = TRUE)
  y_binary[sorted_counts[1]] # All credit to Amir for this one.
}
```

Basic Binary Classification Modeling

- Load the famous `iris` data frame into the namespace. Provide a summary of the columns using the `skim` function in package `skimr` and write a few descriptive sentences about the distributions using the code below and in English.

```
data(iris)
pacman::p_load(skimr)
skim(iris)
```

Table 1: Data summary

Name	iris
Number of rows	150
Number of columns	5
Column type frequency:	
factor	1
numeric	4
Group variables	None

Variable type: factor

skim_variable	n_missing	complete_rate	ordered	n_unique	top_counts
Species	0	1	FALSE	3	set: 50, ver: 50, vir: 50

Variable type: numeric

skim_variable	n_missing	complete_rate	mean	sd	p0	p25	p50	p75	p100	hist
Sepal.Length	0	1	5.84	0.83	4.3	5.1	5.80	6.4	7.9	
Sepal.Width	0	1	3.06	0.44	2.0	2.8	3.00	3.3	4.4	
Petal.Length	0	1	3.76	1.77	1.0	1.6	4.35	5.1	6.9	
Petal.Width	0	1	1.20	0.76	0.1	0.3	1.30	1.8	2.5	

TO-DO: describe this data (english)

The outcome / label / response is `Species`. This is what we will be trying to predict. However, we only care about binary classification between "setosa" and "versicolor" for the purposes of this exercise. Thus the first order of business is to drop one class. Let's drop the data for the level "virginica" from the data frame.

```
iris = iris[iris$Species != "virginica", ]
```

Now create a vector `y` that is length the number of remaining rows in the data frame whose entries are 0 if "setosa" and 1 if "versicolor".

```
y = as.integer(iris$Species == "versicolor")
```

- Write a function `mode` returning the sample mode.

```
mode = function(v){
  names(sort(table(v), decreasing=TRUE)[1])
}
mode(sample(letters, 1000, replace = TRUE))
```

```
## [1] "w"
```

```
mode(y)
```

```
## [1] "0"
```

- Fit a threshold model to `y` using the feature `Sepal.Length`. Write your own code to do this. What is the estimated value of the threshold parameter? Save the threshold value as `threshold`.

```
n = nrow(iris)
num_errors_by_parameter= matrix(NA, nrow=n, ncol=2)
colnames(num_errors_by_parameter) = c("threshold_param", "num_errors")
for (i in 1: n) {
  threshold = iris$Sepal.Length[i]
  num_errors = sum((iris$Sepal.Length>threshold) !=y)
  num_errors_by_parameter[i, ]=c(threshold, num_errors)
}# look at all the threshold values in order
num_errors_by_parameter[order(num_errors_by_parameter[, "num_errors"]), ]
```

```
##       threshold_param num_errors
## [1,]             5.4         11
## [2,]             5.4         11
## [3,]             5.4         11
```

```
##  [4,]              5.4          11
##  [5,]              5.4          11
##  [6,]              5.4          11
##  [7,]              5.5          14
##  [8,]              5.5          14
##  [9,]              5.5          14
## [10,]              5.5          14
## [11,]              5.5          14
## [12,]              5.5          14
## [13,]              5.5          14
## [14,]              5.3          15
## [15,]              5.2          16
## [16,]              5.2          16
## [17,]              5.2          16
## [18,]              5.2          16
## [19,]              5.1          18
## [20,]              5.1          18
## [21,]              5.1          18
## [22,]              5.1          18
## [23,]              5.1          18
## [24,]              5.1          18
## [25,]              5.1          18
## [26,]              5.1          18
## [27,]              5.1          18
## [28,]              5.6          19
## [29,]              5.6          19
## [30,]              5.6          19
## [31,]              5.6          19
## [32,]              5.6          19
## [33,]              5.7          22
## [34,]              5.7          22
## [35,]              5.7          22
## [36,]              5.7          22
## [37,]              5.7          22
## [38,]              5.7          22
## [39,]              5.7          22
## [40,]              5.8          24
## [41,]              5.8          24
## [42,]              5.8          24
## [43,]              5.8          24
## [44,]              5.0          25
## [45,]              5.0          25
## [46,]              5.0          25
## [47,]              5.0          25
## [48,]              5.0          25
## [49,]              5.0          25
## [50,]              5.0          25
## [51,]              5.0          25
## [52,]              5.0          25
## [53,]              5.0          25
## [54,]              5.9          26
## [55,]              5.9          26
## [56,]              6.0          30
## [57,]              6.0          30
```

```
## [58,]              6.0         30
## [59,]              6.0         30
## [60,]              4.9         31
## [61,]              4.9         31
## [62,]              4.9         31
## [63,]              4.9         31
## [64,]              4.9         31
## [65,]              4.8         34
## [66,]              4.8         34
## [67,]              4.8         34
## [68,]              4.8         34
## [69,]              4.8         34
## [70,]              6.1         34
## [71,]              6.1         34
## [72,]              6.1         34
## [73,]              6.1         34
## [74,]              6.2         36
## [75,]              6.2         36
## [76,]              4.7         39
## [77,]              4.7         39
## [78,]              6.3         39
## [79,]              6.3         39
## [80,]              6.3         39
## [81,]              4.6         41
## [82,]              4.6         41
## [83,]              4.6         41
## [84,]              4.6         41
## [85,]              6.4         41
## [86,]              6.4         41
## [87,]              6.5         42
## [88,]              6.6         44
## [89,]              6.6         44
## [90,]              4.5         45
## [91,]              4.4         46
## [92,]              4.4         46
## [93,]              4.4         46
## [94,]              6.7         47
## [95,]              6.7         47
## [96,]              6.7         47
## [97,]              6.8         48
## [98,]              4.3         49
## [99,]              6.9         49
## [100,]             7.0         50
```

```r
# now graab the smallest num errors
best_row = order(num_errors_by_parameter[, "num_errors"])[1]
threshold = c(num_errors_by_parameter[best_row, "threshold_param"], use.names =FALSE)
threshold
```

```
## [1] 5.4
```

What is the total number of errors this model makes?

```r
for (i in 1: n) {
  threshold = iris$Sepal.Length[i]
  num_errors[i] = sum((iris$Sepal.Length>threshold) !=y)
```

```
}
num_errors
```

```
##   [1] 18 31 39 41 25 11 41 25 46 31 11 34 34 49 24 22 11 18 22 18 11 18 41 18 34
##  [26] 25 25 16 16 39 34 11 16 14 31 25 14 31 46 18 25 45 46 25 18 34 18 41 15 25
##  [51] 50 41 49 14 42 22 39 31 44 16 25 26 30 34 19 47 19 24 36 19 26 34 39 34 41
##  [76] 44 48 47 30 22 14 14 24 30 11 30 47 39 19 14 14 34 24 25 19 22 22 36 18 22
```

```
sum(num_errors)
```

```
## [1] 2796
```

Does the threshold model's performance make sense given the following summaries:

```
threshold
```

```
## [1] 5.7
```

```
summary(iris[iris$Species == "setosa", "Sepal.Length"])
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   4.300   4.800   5.000   5.006   5.200   5.800
```

```
summary(iris[iris$Species == "versicolor", "Sepal.Length"])
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   4.900   5.600   5.900   5.936   6.300   7.000
```

TO-DO: Write your answer here in English.

Yes, the threshold model's performance makes sense where it makes less errors for threshold paramters that approach the sepal length mean. The threshold model performs worse as the threshold parameter increases where a threshold paramter of 7 having 50 errors.

Create the function `g` explicitly that can predict `y` from `x` being a new `Sepal.Length`.

```
g = function(x){
  ifelse(x > threshold, 1, 0)
}
```

Perceptron

You will code the "perceptron learning algorithm" for arbitrary number of features p. Take a look at the comments above the function. Respect the spec below:

```
#' TO-DO: Provide a name for this function
#'
#' TO-DO: Explain what this function does in a few sentences
#'
#' @param Xinput      # A matrix of observed features i.e. training data
#' @param y_binary    # A vector of the training data labels
#' @param MAX_ITER    # The maximum iterations that you set the algorithm to run for. Default set to 100
#' @param w           # The input layers
#' @return            The computed final parameter (weight) as a vector of length p + 1
perceptron_learning_algorithm = function(Xinput, y_binary, MAX_ITER = 1000, w = NULL){

Xinput = as.matrix(cbind(1,Xinput))
p = ncol(Xinput)
w = rep(0, p)
```

```
for (iter in 1 : MAX_ITER){
  for (i in 1 : nrow(Xinput)) {
    x_i = Xinput[i, ]
    yhat_i = ifelse(sum(x_i * w) > 0, 1, 0)
    y_i = y_binary[i]
    for(j in 1:p){
      w[j] = w[j] + (y_i - yhat_i) * x_i[j]
    }
  }
}
w
}
```

To understand what the algorithm is doing - linear "discrimination" between two response categories, we can draw a picture. First let's make up some very simple training data $\mathbb{D}$.

```
Xy_simple = data.frame(
 response = factor(c(0, 0, 0, 1, 1, 1)), #nominal
 first_feature = c(1, 1, 2, 3, 3, 4),     #continuous
 second_feature = c(1, 2, 1, 3, 4, 3)    #continuous
)
```

We haven't spoken about visualization yet, but it is important we do some of it now. Thus, I will write this code for you and you will just run it. First we load the visualization library we're going to use:

```
pacman::p_load(ggplot2)
```

We are going to just get some plots and not talk about the code to generate them as we will have a whole unit on visualization using `ggplot2` in the future.

Let's first plot y by the two features so the coordinate plane will be the two features and we use different colors to represent the third dimension, y.

```
simple_viz_obj = ggplot(Xy_simple, aes(x = first_feature, y = second_feature, color = response)) +
  geom_point(size = 5)
simple_viz_obj
```
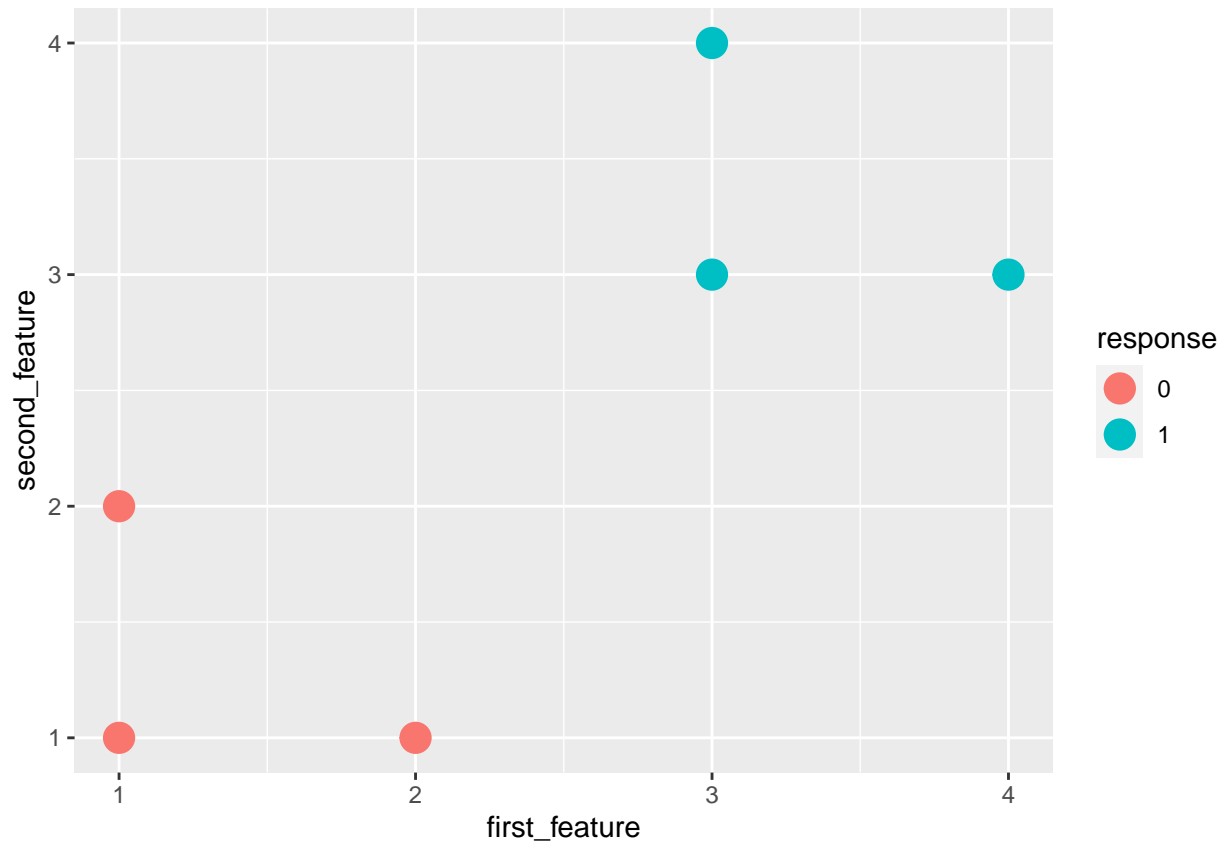
TO-DO: This picture plots the response's, 0 and 1's based on the first and second feature. For example the first 0 in the response correspond to the first number in the first feature vector and the first number in the second feature vector. The first 1 in the response, which is the fourth Now, let us run the algorithm and see what happens:

```
w_vec_simple_per = perceptron_learning_algorithm(
  cbind(Xy_simple$first_feature, Xy_simple$second_feature),
  as.numeric(Xy_simple$response == 1))
w_vec_simple_per
```

```
## [1] -7  4 -1
```

Explain this output. What do the numbers mean? What is the intercept of this line and the slope? You will have to do some algebra.

-7,4,and -1 represent w0, w1, w2 respectively. -7 corresponds to the y intercept of the line, 4 is the coefficient of x1, and -1 is the coefficient of x2. The slope of this line is equal to 4.

TO-DO

```
simple_perceptron_line = geom_abline(
    intercept = -w_vec_simple_per[1] / w_vec_simple_per[3],
    slope = -w_vec_simple_per[2] / w_vec_simple_per[3],
    color = "orange")
simple_viz_obj + simple_perceptron_line
```
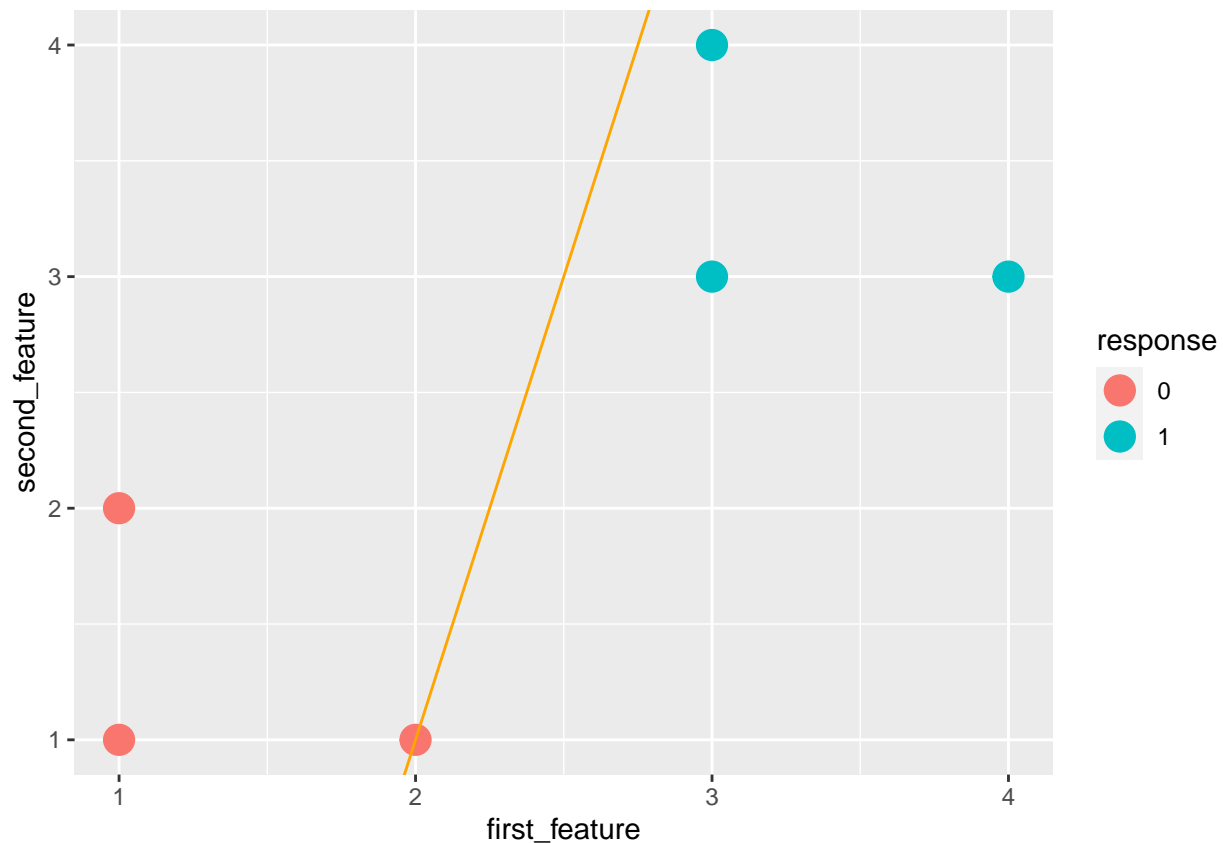
Explain this picture. Why is this line of separation not "satisfying" to you?

This line of separation is not satisfactory since it should be separating the 0's and the 1's preferably by in the middle close to (but not exactly) perpendicular to the current observed line. This line would represent the best model that divides the margin or "Wedge" evenly.

TO-DO

For extra credit, program the maximum-margin hyperplane perceptron that provides the best linear discrimination model for linearly separable data. Make sure you provide ROxygen documentation for this function.

```
#TO-DO
```