HW_Stats_4

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```
#Exercise 1. Rewrite the iterative fibonacci without using first.value, second.value and new.value

#Only use fib.seq
iterative.fibonacci<-function(n)
{
  if(n == 0 || n == 1)
    {return(n)}
  if(n == 2)
    {return(1)} #1, 1, 2

x1=x2=1
for(i in seq(2, n-1)) #create a sequence starting at 2, to n-1
  #For every new x calculated set that to the new x1, and the x2 to the previous x1
  {
  x=x1 + x2
  x2=x1
  x1=x
  }
x  #output

}

#Exercise 2. Compute the last value of the Fibonacci sequence recursively.
#You only need to compute the last value of the sequence.
dynamic.fibonacci <- function (nn)
{
  if(nn==1)
  {
    my.fib <- c(1)
    #assigns fibonacci number as 1 if the input value is 1
    my.fib
  }
  else
  {
    if (nn==2)
    {
      my.fib <- c(2)
      #assigns fibonacci number as 2 if the input value is 2
      my.fib
    }
    else
    {
      if (nn >2 ) #If input value is greater than 2:
      {
        my.fib <- c(1,2) #assign my.fib base values of 1,2
        for (kk in 3:nn)
```

```
          my.fib[kk] <- my.fib[kk-1] + my.fib[kk-2]
        #With base values inputted into my.fib above perform this operation
        # fibonacci calculation
        return(my.fib[nn]) #always return FUNCTION input nn, not bracket kk
        # which is only for nn>2 (precludes n==1 and n==2)

      }
      else
        my.fib <- c (0)
      # returns 0 for disallowed values
      my.fib
    }
  }
}

#Excercise 3
R.Question <- read.csv("C:/Users/Ali Desktop/Desktop/Magic Briefcase/School/1/2- Stat Programming/lectu

rdata<-R.Question

#check the numbers of rows and columns in the data set
dim(rdata)
```

```
## [1] 1623   16
```

```
#check the names of the columns in the data set
names(rdata)
```

```
##  [1] "State.ID"                      "School.Name"
##  [3] "Address"                       "City"
##  [5] "State"                         "Zip"
##  [7] "Phone"                         "School.Type"
##  [9] "Students"                      "Teachers"
## [11] "Members"                       "Teacher.Leaders"
## [13] "Outreach.Director"             "Events.This.Year"
## [15] "Event.Registrations.This.Year" "Event.Attendees.This.Year"
```

```
#aggregating all the members with same city name
groupdata<-aggregate(Members~City,rdata,sum)
#verify
groupdata
```

```
##                    City Members
## 1              Abington       3
## 2                 Acton      17
## 3              Acushnet       0
## 4                 Adams       9
## 5                Agawam      24
## 6               Allston      12
## 7              Amesbury      11
## 8               Amherst       9
## 9               Andover      40
```

```
## 10             Arlington       3
## 11            Ashburnham      11
## 12                 Ashby       0
## 13              Ashfield       0
## 14              Ashland       2
## 15                Athol       6
## 16            Attleboro      41
## 17               Auburn      12
## 18                 Avon       4
## 19                 Ayer       0
## 20          Baldwinville       6
## 21                Barre      13
## 22          Baton Rouge       0
## 23               Becket       1
## 24              Bedford      16
## 25          Belchertown      17
## 26           Bellingham       6
## 27              Belmont      14
## 28              Berkley      12
## 29               Berlin       0
## 30          Bernardston       0
## 31              Beverly      20
## 32             Billerica      28
## 33           Blackstone       6
## 34               Bolton       3
## 35               Boston      63
## 36               Bourne      13
## 37           Bournedale       0
## 38           Boxborough       1
## 39              Boxford      10
## 40             Boylston       0
## 41             Bradford       6
## 42             Braintree      27
## 43              Brewster       4
## 44          Bridgewater      12
## 45              Brighton      14
## 46             Brimfield       0
## 47              Brockton      55
## 48           Brookfield       0
## 49             Brookline      29
## 50           Burlington      16
## 51              Byfield       6
## 52            Cambridge      39
## 53               Canton      26
## 54             Carlisle       5
## 55               Carver      13
## 56          Centerville       0
## 57           Charlemont       1
## 58          Charlestown       7
## 59              Charlton      12
## 60               Chatham       2
## 61           Chelmsford      20
## 62               Chelsea      43
## 63              Cheshire       0
```

```
## 64              Chester       0
## 65          Chesterfield      0
## 66         Chestnut Hill      1
## 67              Chicopee      77
## 68              Chilmark      0
## 69            Clarksburg      0
## 70               Clinton      16
## 71              Cohasset      10
## 72               Colrain      0
## 73               Concord      2
## 74                Conway      1
## 75            Cummington      0
## 76             Cuttyhunk      0
## 77                Dalton      9
## 78               Danvers      19
## 79             Dartmouth      11
## 80                Dedham      16
## 81                Devens      3
## 82               Dighton      8
## 83            Dorchester     108
## 84               Douglas      14
## 85                 Dover      3
## 86                Dracut      13
## 87                Dudley      11
## 88             Dunstable      0
## 89                Duxbury      9
## 90           East Boston      26
## 91      East Bridgewater      4
## 92       East Brookfield      0
## 93         East Falmouth      3
## 94         East Freetown      3
## 95       East Longmeadow      21
## 96         East Sandwich      0
## 97          East Taunton      8
## 98          East Walpole      0
## 99          East Wareham      1
## 100        East Weymouth      3
## 101              Eastham      0
## 102         Easthampton      19
## 103            Edgartown      3
## 104                Erving      3
## 105                Essex      2
## 106              Everett      35
## 107            Fairhaven      17
## 108           Fall River      58
## 109              Falmouth      22
## 110        Feeding Hills      6
## 111              Fiskdale      0
## 112            Fitchburg      39
## 113              Florence      15
## 114              Florida      1
## 115           Foxborough      13
## 116           Framingham      40
## 117              Franklin      51
```

```
## 118              Gardner      13
## 119           Georgetown       0
## 120         Gilbertville       0
## 121                 Gill       1
## 122           Gloucester      20
## 123              Grafton      21
## 124               Granby       2
## 125            Granville       0
## 126     Great Barrington      10
## 127           Greenfield       2
## 128               Groton       4
## 129            Groveland       2
## 130               Hadley       1
## 131              Halifax       0
## 132             Hamilton       0
## 133              Hampden       5
## 134              Hancock       0
## 135              Hanover      10
## 136 Hanscom Air Force Bs       2
## 137               Hanson       4
## 138              Harvard       0
## 139              Harwich      19
## 140             Hatfield       1
## 141             Hathorne       5
## 142            Haverhill      70
## 143          Haydenville       1
## 144                Heath       0
## 145              Hingham      18
## 146             Holbrook       2
## 147               Holden      16
## 148              Holland       3
## 149            Holliston      15
## 150              Holyoke      62
## 151             Hopedale       5
## 152            Hopkinton       1
## 153          Hubbardston       4
## 154               Hudson      15
## 155                 Hull       6
## 156           Huntington       8
## 157              Hyannis      38
## 158            Hyde Park      12
## 159       Indian Orchard       0
## 160              Ipswich      21
## 161        Jamaica Plain       7
## 162            Jefferson       0
## 163             Kingston      20
## 164            Lakeville       4
## 165            Lancaster       6
## 166         Lanesborough       3
## 167             Lawrence      89
## 168                  Lee       7
## 169            Leicester      14
## 170                Lenox       4
## 171           Leominster      15
```

```
## 172            Leverett       0
## 173           Lexington      14
## 174              Leyden       1
## 175             Lincoln       3
## 176           Littleton       5
## 177          Longmeadow      10
## 178              Lowell      61
## 179              Ludlow      21
## 180           Lunenburg      14
## 181                Lynn      57
## 182           Lynnfield      10
## 183              Malden      20
## 184          Manchester       4
## 185           Mansfield      40
## 186          Marblehead      13
## 187         Marlborough      18
## 188          Marshfield      14
## 189      Marstons Mills       5
## 190             Mashpee       7
## 191            Mattapan      11
## 192        Mattapoisett       5
## 193             Maynard       5
## 194            Medfield       4
## 195             Medford      40
## 196              Medway      19
## 197             Melrose      15
## 198              Mendon       5
## 199            Merrimac       4
## 200             Methuen       3
## 201          Middleboro       0
## 202       Middleborough       5
## 203     Middleofnowhere       0
## 204            Middleton       7
## 205              Milford      14
## 206            Millbury      14
## 207              Millis      13
## 208           Millville       2
## 209              Milton      12
## 210              Monson      12
## 211            Montague       6
## 212           Nantucket      10
## 213              Natick      22
## 214             Needham      22
## 215         New Bedford      84
## 216       New Braintree       0
## 217           New Salem       1
## 218             Newbury       6
## 219         Newburyport      22
## 220              Newton       7
## 221       Newton Centre      20
## 222    Newton Highlands       0
## 223         Newtonville      11
## 224              Norfolk      14
## 225         North Adams       9
```

```
## 226        North Andover      14
## 227   North Attleborough      22
## 228      North Billerica       2
## 229     North Brookfield       0
## 230     North Chelmsford       1
## 231      North Dartmouth       5
## 232        North Dighton       0
## 233        North Eastham      17
## 234         North Easton      13
## 235       North Falmouth       2
## 236        North Grafton       0
## 237        North Reading      13
## 238       North Weymouth       0
## 239          Northampton      17
## 240         Northborough      11
## 241           Northfield       7
## 242               Norton       8
## 243              Norwell       0
## 244              Norwood      25
## 245           Oak Bluffs      17
## 246               Oakham       1
## 247                Onset       0
## 248               Orange       4
## 249              Orleans      12
## 250                 Otis       0
## 251               Oxford      10
## 252               Palmer      25
## 253               Paxton       5
## 254              Peabody      27
## 255               Pelham       1
## 256             Pembroke      15
## 257            Pepperell       4
## 258            Petersham       0
## 259          Phillipston       1
## 260           Pittsfield       6
## 261           Plainville       1
## 262             Plymouth      47
## 263             Plympton       0
## 264            Princeton       3
## 265        Provincetown       4
## 266               Quincy      41
## 267             Randolph      10
## 268              Raynham       9
## 269              Reading      20
## 270             Rehoboth       3
## 271               Revere      50
## 272             Richmond       3
## 273            Rochester       3
## 274             Rockland      11
## 275             Rockport       4
## 276           Roslindale      11
## 277                 Rowe       0
## 278              Roxbury      43
## 279        Roxbury Plain       1
```

```
## 280            Royalston       0
## 281              Rutland       6
## 282                Salem      29
## 283            Salisbury       7
## 284             Sandwich       6
## 285               Saugus      23
## 286                Savoy       0
## 287             Scituate      26
## 288              Seekonk       8
## 289               Sharon       9
## 290            Sheffield       6
## 291      Shelburne Falls       0
## 292              Shirley       5
## 293           Shrewsbury      21
## 294           Shutesbury       1
## 295             Somerset      18
## 296           Somerville      46
## 297      South Attleboro       4
## 298         South Boston      23
## 299      South Dartmouth       0
## 300      South Deerfield       7
## 301         South Dennis       3
## 302         South Easton      12
## 303        South Grafton       2
## 304         South Hadley       5
## 305       South Hamilton       8
## 306       South Weymouth       3
## 307       South Yarmouth       1
## 308          Southampton       6
## 309         Southborough       4
## 310          Southbridge       3
## 311            Southwick      14
## 312              Spencer       5
## 313           Springfield     205
## 314              Sterling       5
## 315              Stoneham      10
## 316             Stoughton       7
## 317                  Stow       0
## 318            Sturbridge       7
## 319               Sudbury       3
## 320            Sunderland       0
## 321                Sutton       4
## 322            Swampscott      18
## 323               Swansea      10
## 324               Taunton      55
## 325             Templeton       1
## 326             Tewksbury       8
## 327             Topsfield      21
## 328              Townsend       6
## 329                 Truro       0
## 330         Turners Falls       5
## 331             Tyngsboro       7
## 332          Tyngsborough       8
## 333                 Upton      11
```

```
## 334             Uxbridge       9
## 335       Vineyard Haven       3
## 336            Wakefield      30
## 337                Wales       1
## 338              Walpole      33
## 339              Waltham      15
## 340                 Ware       9
## 341              Wareham      17
## 342               Warren       1
## 343              Warwick       0
## 344            Watertown      19
## 345              Wayland       2
## 346              Webster       6
## 347            Wellesley      22
## 348            Wellfleet       0
## 349                Wenham       2
## 350     West Barnstable       0
## 351       West Boylston       4
## 352    West Bridgewater       8
## 353     West Brookfield       0
## 354         West Dennis       3
## 355        West Newbury       9
## 356        West Roxbury       7
## 357    West Springfield      44
## 358        West Tisbury       4
## 359         West Warren       1
## 360       West Yarmouth       6
## 361         Westborough      15
## 362           Westfield      36
## 363            Westford      13
## 364         Westhampton      13
## 365         Westminster       3
## 366              Weston      17
## 367            Westport       7
## 368            Westwood      12
## 369            Weymouth      24
## 370             Whately       0
## 371        Whitinsville      13
## 372             Whitman       8
## 373           Wilbraham      11
## 374        Williamsburg       1
## 375        Williamstown      11
## 376          Wilmington      21
## 377          Winchendon       0
## 378          Winchester      17
## 379            Winthrop      11
## 380              Woburn      13
## 381            Woodbury       0
## 382           Worcester      57
## 383             Wrentham      20
```

```
#Finding the row number corresponding to maximum value of members
which.max(groupdata$Members)
```

```
## [1] 313
```

```
#Display all the row details (city & members here) with maximum number of members
groupdata[313,]
```

```
##            City Members
## 313 Springfield     205
```