

# Chapter 5 Demographic Accounts

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## Setup

```
library(bdefdata)
library(dembase)
library(dplyr)
```

## Account with No Region and No Age

```
population <- bdefdata::twelve_population %>%
  xtabs(~ time, data = .) %>%
  Counts()
population

## An object of class "Counts"
##
## name:      time
## length:    2
## dimtype:   time
## dimscale:  Points
## first:     1980
## last:      2010
##
## time
## 1980 2010
##      6   8

births <- bdefdata::twelve_births %>%
  mutate(time = timeToPeriod(time, breaks = c(1980, 2010))) %>%
  xtabs(~ time, data = .) %>%
  Counts()
births

## An object of class "Counts"
##
## name:      time
## length:    1
## dimtype:   time
## dimscale:  Intervals
## first:     1981-2010
## last:      1981-2010
##
## time
## 1981-2010
##           3
```

```

deaths <- bdefdata::twelve_deaths %>%
  mutate(time = timeToPeriod(time, breaks = c(1980, 2010))) %>%
  xtabs(~ time, data = .) %>%
  Counts()
deaths

```

```

## An object of class "Counts"
##
## name:      time
## length:    1
## dimtype:   time
## dimscale:  Intervals
## first:     1981-2010
## last:      1981-2010
##
## time
## 1981-2010
##          2

```

```

immigration <- bdefdata::twelve_immigration %>%
  mutate(time = timeToPeriod(time, breaks = c(1980, 2010))) %>%
  xtabs(~ time, data = .) %>%
  Counts()
immigration

```

```

## An object of class "Counts"
##
## name:      time
## length:    1
## dimtype:   time
## dimscale:  Intervals
## first:     1981-2010
## last:      1981-2010
##
## time
## 1981-2010
##          4

```

```

emigration <- bdefdata::twelve_emigration %>%
  mutate(time = timeToPeriod(time, breaks = c(1980, 2010))) %>%
  xtabs(~ time, data = .) %>%
  Counts()
emigration

```

```

## An object of class "Counts"
##
## name:      time
## length:    1
## dimtype:   time
## dimscale:  Intervals
## first:     1981-2010
## last:      1981-2010
##
## time
## 1981-2010

```

```

##          3
account <- Movements(population = population,
                     entries = list(births = births,
                                     immigration = immigration),
                     exits = list(deaths = deaths,
                                   emigration = emigration))
account

## An object of class "Movements"
##
## name:      time
## length:   1
## dimtype:  time
## dimscale: Intervals
## first:    1981-2010
## last:     1981-2010
##
## all cells consistent : TRUE
##
## --- population -----
##
## time
## 1980 2010
##    6   8
##
##
## --- births -----
##
## time
## 1981-2010
##        3
##
##
## --- immigration -----
##
## time
## 1981-2010
##        4
##
##
## --- deaths -----
##
## time
## 1981-2010
##        2
##
##
## --- emigration -----
##
## time
## 1981-2010
##        3

```

```
summary(account)
```

```
## An object of class Movements
##
## name:      time
## length:    1
## dimtype:   time
## dimscale:  Intervals
## first:     1981-2010
## last:      1981-2010
##
##           1980 2010
## population   6   8
##
##           1981-2010
##   births (+)      3
## immigration (+)   4
##   deaths (-)      2
## emigration (-)   3
##
## all cells consistent : TRUE
```

## Account with Region and No Age

```
population <- bdefdata::twelve_population %>%
  xtabs(~ region + time, data = .) %>%
  Counts()
population
```

```
## An object of class "Counts"
##
## name:      region      time
## length:    2          2
## dimtype:   state      time
## dimscale:  Categories Points
## first:     West       1980
## last:      East       2010
##
##           time
## region 1980 2010
##   West   4   4
##   East   2   4
```

```
births <- bdefdata::twelve_births %>%
  mutate(time = timeToPeriod(time, breaks = c(1980, 2010))) %>%
  xtabs(~ region + time, data = .) %>%
  Counts()
births
```

```
## An object of class "Counts"
##
## name:      region      time
## length:    2          1
```

```
## dimtype: state      time
## dimscale: Categories Intervals
## first:   West      1981-2010
## last:    East      1981-2010
##
##         time
## region 1981-2010
##  West      2
##  East      1
```

```
deaths <- bdefdata::twelve_deaths %>%
  mutate(time = timeToPeriod(time, breaks = c(1980, 2010))) %>%
  xtabs(~ region + time, data = .) %>%
  Counts()
deaths
```

```
## An object of class "Counts"
##
## name:    region      time
## length:  2          1
## dimtype: state      time
## dimscale: Categories Intervals
## first:   West      1981-2010
## last:    East      1981-2010
##
##         time
## region 1981-2010
##  West      1
##  East      1
```

```
immigration <- bdefdata::twelve_immigration %>%
  mutate(time = timeToPeriod(time, breaks = c(1980, 2010))) %>%
  xtabs(~ region + time, data = .) %>%
  Counts()
immigration
```

```
## An object of class "Counts"
##
## name:    region      time
## length:  2          1
## dimtype: state      time
## dimscale: Categories Intervals
## first:   West      1981-2010
## last:    East      1981-2010
##
##         time
## region 1981-2010
##  West      3
##  East      1
```

```
emigration <- bdefdata::twelve_emigration %>%
  mutate(time = timeToPeriod(time, breaks = c(1980, 2010))) %>%
  xtabs(~ region + time, data = .) %>%
  Counts()
emigration
```

```

## An object of class "Counts"
##
## name:      region      time
## length:    2          1
## dimtype:   state      time
## dimscales: Categories Intervals
## first:     West       1981-2010
## last:      East       1981-2010
##
##          time
## region 1981-2010
##   West      2
##   East      1
movements <- bdefdata::twelve_movements %>%
  mutate(time = timeToPeriod(time, breaks = c(1980, 2010))) %>%
  xtabs(~ region_orig + region_dest + time, data = .) %>%
  Counts()
movements

```

```

## An object of class "Counts"
##
## name:      region_orig region_dest time
## length:    2          2          1
## dimtype:   origin      destination time
## dimscales: Categories Categories Intervals
## first:     West       West       1981-2010
## last:      East       East       1981-2010
##
## , , time = 1981-2010
##
##          region_dest
## region_orig West East
##   West      0    5
##   East      3    0

```

```
collapseOrigDest(movements, to = "Pool")
```

```

## An object of class "Pool"
##
## name:      region      time      direction
## length:    2          1          2
## dimtype:   state      time      state
## dimscales: Categories Intervals Categories
## first:     West       1981-2010 Out
## last:      East       1981-2010 In
##
## , , direction = Out
##
##          time
## region 1981-2010
##   West      5
##   East      3
##
## , , direction = In
##

```

```
##      time
## region 1981-2010
##   West      3
##   East      5
collapseOrigDest(movements, to = "Net")
```

```
## An object of class "Net"
##
## name:      region      time
## length:   2           1
## dimtype:  state       time
## dimscales: Categories Intervals
## first:   West        1981-2010
## last:    East        1981-2010
##
##      time
## region 1981-2010
##   West      -2
##   East       2
```

```
account <- Movements(population = population,
                     internal = movements,
                     entries = list(births = births,
                                     immigration = immigration),
                     exits = list(deaths = deaths,
                                   emigration = emigration))
account
```

```
## An object of class "Movements"
##
## name:      region      time
## length:   2           1
## dimtype:  state       time
## dimscales: Categories Intervals
## first:   West        1981-2010
## last:    East        1981-2010
##
## all cells consistent : TRUE
##
## --- population -----
##
##      time
## region 1980 2010
##   West   4   4
##   East   2   4
##
##
## --- internal -----
##
## , , time = 1981-2010
##
##      region_dest
## region_orig West East
##      West   0   5
##      East   3   0
```

```

##
##
##
## --- births -----
##
##      time
## region 1981-2010
##   West      2
##   East      1
##
##
## --- immigration -----
##
##      time
## region 1981-2010
##   West      3
##   East      1
##
##
## --- deaths -----
##
##      time
## region 1981-2010
##   West      1
##   East      1
##
##
## --- emigration -----
##
##      time
## region 1981-2010
##   West      2
##   East      1

```

```
summary(account)
```

```

## An object of class Movements
##
## name:      region      time
## length:    2          1
## dimtype:   state      time
## dimscales: Categories Intervals
## first:     West       1981-2010
## last:      East       1981-2010
##
##           1980 2010
## population  6   8
##
##           1981-2010
##   internal (.)      8
##   births (+)       3
## immigration (+)    4
##   deaths (-)       2
## emigration (-)    3
##

```

```
## all cells consistent : TRUE
```