Lab 0

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February 4, 2016

```
arbuthnot <-
structure(list(year = 1629:1710, boys = c(5218L, 4858L, 4422L,
4994L, 5158L, 5035L, 5106L, 4917L, 4703L, 5359L, 5366L, 5518L,
5470L, 5460L, 4793L, 4107L, 4047L, 3768L, 3796L, 3363L, 3079L,
2890L, 3231L, 3220L, 3196L, 3441L, 3655L, 3668L, 3396L, 3157L,
3209L, 3724L, 4748L, 5216L, 5411L, 6041L, 5114L, 4678L, 5616L,
6073L, 6506L, 6278L, 6449L, 6443L, 6073L, 6113L, 6058L, 6552L,
6423L, 6568L, 6247L, 6548L, 6822L, 6909L, 7577L, 7575L, 7484L,
7575L, 7737L, 7487L, 7604L, 7909L, 7662L, 7602L, 7676L, 6985L,
7263L, 7632L, 8062L, 8426L, 7911L, 7578L, 8102L, 8031L, 7765L,
6113L, 8366L, 7952L, 8379L, 8239L, 7840L, 7640L), girls = c(4683L,
4457L, 4102L, 4590L, 4839L, 4820L, 4928L, 4605L, 4457L, 4952L,
4784L, 5332L, 5200L, 4910L, 4617L, 3997L, 3919L, 3395L, 3536L,
3181L, 2746L, 2722L, 2840L, 2908L, 2959L, 3179L, 3349L, 3382L,
3289L, 3013L, 2781L, 3247L, 4107L, 4803L, 4881L, 5681L, 4858L,
4319L, 5322L, 5560L, 5829L, 5719L, 6061L, 6120L, 5822L, 5738L,
5717L, 5847L, 6203L, 6033L, 6041L, 6299L, 6533L, 6744L, 7158L,
7127L, 7246L, 7119L, 7214L, 7101L, 7167L, 7302L, 7392L, 7316L,
7483L, 6647L, 6713L, 7229L, 7767L, 7626L, 7452L, 7061L, 7514L,
7656L, 7683L, 5738L, 7779L, 7417L, 7687L, 7623L, 7380L, 7288L
)), .Names = c("year", "boys", "girls"), class = "data.frame", row.names = c(NA,
-82L))
```

```
#Show the dimensions of the Matrix
dim(arbuthnot)
```

```
## [1] 82  3
```

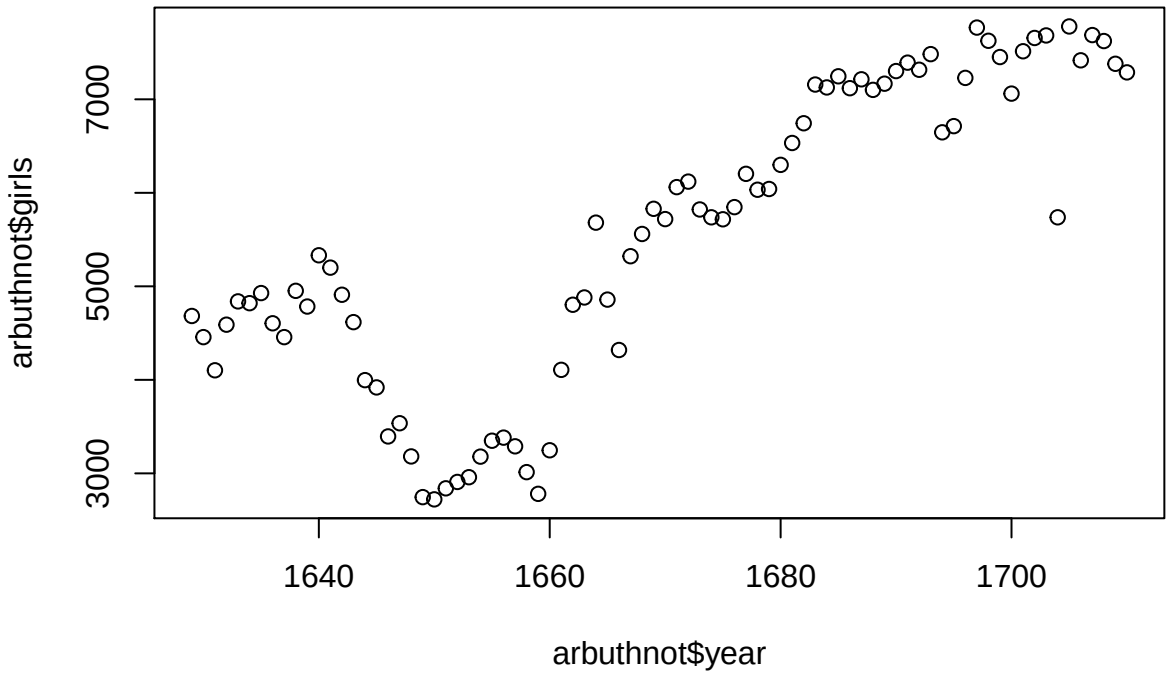
```
#Show the names of the Matrix
names(arbuthnot)
```

```
## [1] "year"  "boys"  "girls"
```

```
#Exercise 1, Show the number of girls baptozed each year
arbuthnot$girls
```

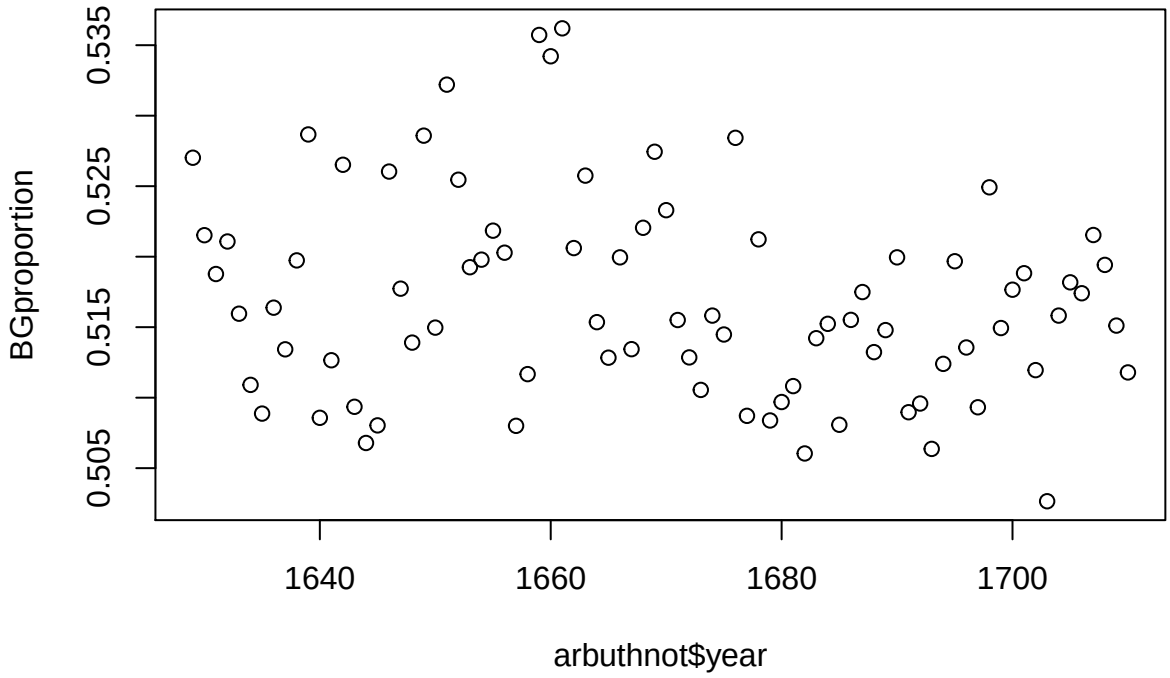
```
##  [1] 4683 4457 4102 4590 4839 4820 4928 4605 4457 4952 4784 5332 5200 4910
## [15] 4617 3997 3919 3395 3536 3181 2746 2722 2840 2908 2959 3179 3349 3382
## [29] 3289 3013 2781 3247 4107 4803 4881 5681 4858 4319 5322 5560 5829 5719
## [43] 6061 6120 5822 5738 5717 5847 6203 6033 6041 6299 6533 6744 7158 7127
## [57] 7246 7119 7214 7101 7167 7302 7392 7316 7483 6647 6713 7229 7767 7626
## [71] 7452 7061 7514 7656 7683 5738 7779 7417 7687 7623 7380 7288
```

```r
#Exercise 2
plot(x = arbuthnot$year, y = arbuthnot$girls)
```




```r
#There does seem to be a trend to the data. in the early years female baptism was actually steadily inc
#Once it hit 1640, female baptism slowly started to decline (1640-1660). After 1660, female baptism sta
#again, more so then the recent oncrease (1620-1640). At the end of the data plot, you can see that the
#again. The graph looks a little sin/cos like to me, with the rise and decline that is happening.
```

```r
#Exercise 3
BGproportion <- (arbuthnot$boys / (arbuthnot$boys + arbuthnot$girls))
plot(x = arbuthnot$year, y = BGproportion)
```




```
present <-
structure(list(year = c(1940, 1941, 1942, 1943, 1944, 1945, 1946,
1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957,
1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968,
1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979,
1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990,
1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001,
2002), boys = c(1211684, 1289734, 1444365, 1508959, 1435301,
1404587, 1691220, 1899876, 1813852, 1826352, 1823555, 1923020,
1971262, 2001798, 2059068, 2073719, 2133588, 2179960, 2152546,
2173638, 2179708, 2186274, 2132466, 2101632, 2060162, 1927054,
1845862, 1803388, 1796326, 1846572, 1915378, 1822910, 1669927,
1608326, 1622114, 1613135, 1624436, 1705916, 1709394, 1791267,
1852616, 1860272, 1885676, 1865553, 1879490, 1927983, 1924868,
1951153, 2002424, 2069490, 2129495, 2101518, 2082097, 2048861,
2022589, 1996355, 1990480, 1985596, 2016205, 2026854, 2076969,
2057922, 2057979), girls = c(1148715, 1223693, 1364631, 1427901,
1359499, 1330869, 1597452, 1800064, 1721216, 1733177, 1730594,
1827830, 1875724, 1900322, 1958294, 1973576, 2029502, 2074824,
2051266, 2071158, 2078142, 2082052, 2034896, 1996388, 1967328,
1833304, 1760412, 1717571, 1705238, 1753634, 1816008, 1733060,
1588484, 1528639, 1537844, 1531063, 1543352, 1620716, 1623885,
1703131, 1759642, 1768966, 1794861, 1773380, 1789651, 1832578,
1831679, 1858241, 1907086, 1971468, 2028717, 2009389, 1982917,
1951379, 1930178, 1903234, 1901014, 1895298, 1925348, 1932563,
1981845, 1968011, 1963747)), .Names = c("year", "boys", "girls"
```

```
), row.names = c(NA, 63L), class = "data.frame")
```

```
#Show the years that are withing 'present'
present$year
```

```
##  [1] 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953
## [15] 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967
## [29] 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981
## [43] 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995
## [57] 1996 1997 1998 1999 2000 2001 2002
```

```
#Show the dimentions of present
dim(present)
```

```
## [1] 63  3
```

```
#Show the column names of present
names(present)
```

```
## [1] "year"  "boys"  "girls"
```

```
#number of boys over the given years in present
present$boys
```

```
##  [1] 1211684 1289734 1444365 1508959 1435301 1404587 1691220 1899876
##  [9] 1813852 1826352 1823555 1923020 1971262 2001798 2059068 2073719
## [17] 2133588 2179960 2152546 2173638 2179708 2186274 2132466 2101632
## [25] 2060162 1927054 1845862 1803388 1796326 1846572 1915378 1822910
## [33] 1669927 1608326 1622114 1613135 1624436 1705916 1709394 1791267
## [41] 1852616 1860272 1885676 1865553 1879490 1927983 1924868 1951153
## [49] 2002424 2069490 2129495 2101518 2082097 2048861 2022589 1996355
## [57] 1990480 1985596 2016205 2026854 2076969 2057922 2057979
```

```
#number of boys over the given years in arbuthnot
arbuthnot$boys
```

```
##  [1] 5218 4858 4422 4994 5158 5035 5106 4917 4703 5359 5366 5518 5470 5460
## [15] 4793 4107 4047 3768 3796 3363 3079 2890 3231 3220 3196 3441 3655 3668
## [29] 3396 3157 3209 3724 4748 5216 5411 6041 5114 4678 5616 6073 6506 6278
## [43] 6449 6443 6073 6113 6058 6552 6423 6568 6247 6548 6822 6909 7577 7575
## [57] 7484 7575 7737 7487 7604 7909 7662 7602 7676 6985 7263 7632 8062 8426
## [71] 7911 7578 8102 8031 7765 6113 8366 7952 8379 8239 7840 7640
```

```
#It is obvious that the number of boys being baptized in the present is significantlly
#higher than it was in the past

#number of girls over the given years in present
present$girls
```

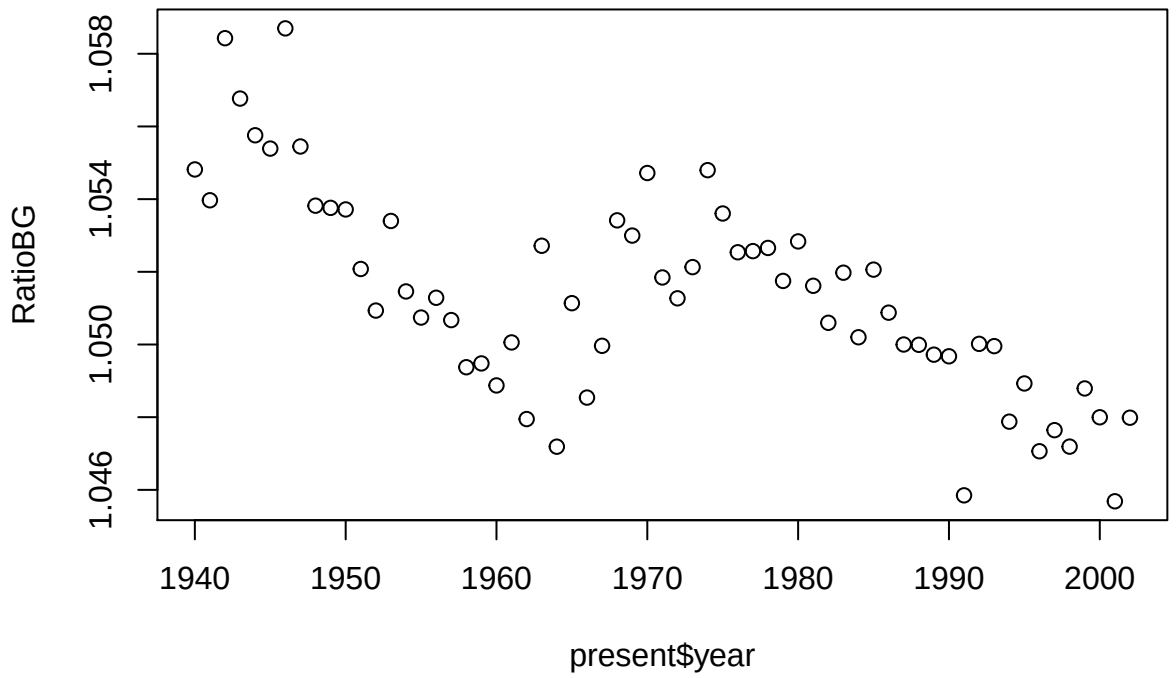
```
##  [1] 1148715 1223693 1364631 1427901 1359499 1330869 1597452 1800064
##  [9] 1721216 1733177 1730594 1827830 1875724 1900322 1958294 1973576
## [17] 2029502 2074824 2051266 2071158 2078142 2082052 2034896 1996388
## [25] 1967328 1833304 1760412 1717571 1705238 1753634 1816008 1733060
## [33] 1588484 1528639 1537844 1531063 1543352 1620716 1623885 1703131
## [41] 1759642 1768966 1794861 1773380 1789651 1832578 1831679 1858241
## [49] 1907086 1971468 2028717 2009389 1982917 1951379 1930178 1903234
## [57] 1901014 1895298 1925348 1932563 1981845 1968011 1963747
```

```
#number of girls over the given years in arbuthnot
arbuthnot$girls
```

```
##  [1] 4683 4457 4102 4590 4839 4820 4928 4605 4457 4952 4784 5332 5200 4910
## [15] 4617 3997 3919 3395 3536 3181 2746 2722 2840 2908 2959 3179 3349 3382
## [29] 3289 3013 2781 3247 4107 4803 4881 5681 4858 4319 5322 5560 5829 5719
## [43] 6061 6120 5822 5738 5717 5847 6203 6033 6041 6299 6533 6744 7158 7127
## [57] 7246 7119 7214 7101 7167 7302 7392 7316 7483 6647 6713 7229 7767 7626
## [71] 7452 7061 7514 7656 7683 5738 7779 7417 7687 7623 7380 7288
```

```
#It is obvious that the number of girls being baptized in the present is significantlly
#higher than it was in the past
```

```
RatioBG <- present$boys/present$girls
plot(x = present$year, y = RatioBG)
```



```
#I see that the ratio of boys to girls is slowly declining. The ratio is still above
#one, which means there are more boys that girls being born, but the number is
#creeping towards 1, so for the current data that is available, arbuthot is right.
#If we continue the data out for a few more years, the girls may surpass the boys.
```

```
#The total number of births for a given year
TotalBirths <- present$boys + present$girls
TotalBirths
```

```
##  [1] 2360399 2513427 2808996 2936860 2794800 2735456 3288672 3699940
##  [9] 3535068 3559529 3554149 3750850 3846986 3902120 4017362 4047295
## [17] 4163090 4254784 4203812 4244796 4257850 4268326 4167362 4098020
## [25] 4027490 3760358 3606274 3520959 3501564 3600206 3731386 3555970
## [33] 3258411 3136965 3159958 3144198 3167788 3326632 3333279 3494398
## [41] 3612258 3629238 3680537 3638933 3669141 3760561 3756547 3809394
## [49] 3909510 4040958 4158212 4110907 4065014 4000240 3952767 3899589
## [57] 3891494 3880894 3941553 3959417 4058814 4025933 4021726
```

```
#Ranks the total number of births (assigns them a number 1 being the smallest)
RankTotalBirths <- rank(TotalBirths)
RankTotalBirths
```

```
##  [1]  1  2  5  6  4  3 12 29 18 21 19 31 36 40 46 51 57 61 59 60 62 63 58
## [24] 54 49 33 23 17 16 22 30 20 11  7  9  8 10 13 14 15 24 25 28 26 27 34
## [47] 32 35 41 50 56 55 53 45 43 39 38 37 42 44 52 48 47
```

```
#Finds the largest number within the ranking (largest sum of births)
MaxRank <- max(RankTotalBirths)
MaxRank
```

```
## [1] 63
```

```
#Finds the position of the largest rank within the list of rankings
#(smallest being in postion #1)
MatchRank <- match(MaxRank,RankTotalBirths)
MatchRank
```

```
## [1] 22
```

```
#Finds the starting year of the present data frame
StartBirthYear <- min(present$year)
StartBirthYear
```

```
## [1] 1940
```

```
#Adds the position of the number of years since 1940 of the largest amount
#of births
MaxBirthYear <- StartBirthYear + MatchRank - 1
MaxBirthYear
```

```
## [1] 1961
```