# Assignment 4 updated

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### 12.6.1 problems 3 and 4

```
library(tidyverse)
```

```
## -- Attaching packages ------------------------------------------------------- tidyverse 1.2.1 --
```

```
## √ ggplot2 2.2.1     √ purrr   0.2.4
## √ tibble  1.4.2     √ dplyr   0.7.4
## √ tidyr   0.7.2     √ stringr 1.2.0
## √ readr   1.1.1     √ forcats 0.2.0
```

```
## -- Conflicts ---------------------------------------------------------- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(dplyr)
library(tidyr)
```

(3) I claimed that *iso*2 and *iso*3 were redundant with country. Confirm this claim.

```
# Original Data and textbook code

tidyr::who
```

```
## # A tibble: 7,240 x 60
##    country     iso2  iso3   year new_sp_m014 new_sp_m1524 new_sp_m2534
##    <chr>       <chr> <chr> <int>       <int>        <int>        <int>
##  1 Afghanistan AF    AFG    1980          NA           NA           NA
##  2 Afghanistan AF    AFG    1981          NA           NA           NA
##  3 Afghanistan AF    AFG    1982          NA           NA           NA
##  4 Afghanistan AF    AFG    1983          NA           NA           NA
##  5 Afghanistan AF    AFG    1984          NA           NA           NA
##  6 Afghanistan AF    AFG    1985          NA           NA           NA
##  7 Afghanistan AF    AFG    1986          NA           NA           NA
##  8 Afghanistan AF    AFG    1987          NA           NA           NA
##  9 Afghanistan AF    AFG    1988          NA           NA           NA
## 10 Afghanistan AF    AFG    1989          NA           NA           NA
## # ... with 7,230 more rows, and 53 more variables: new_sp_m3544 <int>,
## #   new_sp_m4554 <int>, new_sp_m5564 <int>, new_sp_m65 <int>,
## #   new_sp_f014 <int>, new_sp_f1524 <int>, new_sp_f2534 <int>,
## #   new_sp_f3544 <int>, new_sp_f4554 <int>, new_sp_f5564 <int>,
## #   new_sp_f65 <int>, new_sn_m014 <int>, new_sn_m1524 <int>,
## #   new_sn_m2534 <int>, new_sn_m3544 <int>, new_sn_m4554 <int>,
## #   new_sn_m5564 <int>, new_sn_m65 <int>, new_sn_f014 <int>,
## #   new_sn_f1524 <int>, new_sn_f2534 <int>, new_sn_f3544 <int>,
## #   new_sn_f4554 <int>, new_sn_f5564 <int>, new_sn_f65 <int>,
## #   new_ep_m014 <int>, new_ep_m1524 <int>, new_ep_m2534 <int>,
## #   new_ep_m3544 <int>, new_ep_m4554 <int>, new_ep_m5564 <int>,
## #   new_ep_m65 <int>, new_ep_f014 <int>, new_ep_f1524 <int>,
## #   new_ep_f2534 <int>, new_ep_f3544 <int>, new_ep_f4554 <int>,
## #   new_ep_f5564 <int>, new_ep_f65 <int>, newrel_m014 <int>,
## #   newrel_m1524 <int>, newrel_m2534 <int>, newrel_m3544 <int>,
## #   newrel_m4554 <int>, newrel_m5564 <int>, newrel_m65 <int>,
## #   newrel_f014 <int>, newrel_f1524 <int>, newrel_f2534 <int>,
## #   newrel_f3544 <int>, newrel_f4554 <int>, newrel_f5564 <int>,
## #   newrel_f65 <int>
```

```
who1 <- who %>%
  gather(new_sp_m014:newrel_f65, key = "key", value = "cases", na.rm = TRUE)
who2 <- who1 %>%
  mutate(key = stringr::str_replace(key, "newrel", "new_rel"))
who3 <- who2 %>%
  separate(key, c("new", "type", "sexage"), sep = "_")
who4 <- who3 %>%
  select(-new, -iso2, -iso3)
who5 <- who4 %>%
  separate(sexage, c("sex", "age"), sep = 1)
```

```
a <- select(who3, country, iso2, iso3)
b <- unique.data.frame(a) %>%
# select unique rows from the data group of who3, country, iso2 and iso3
  group_by(country) %>%
  filter(n() > 1)
b
```

```
## # A tibble: 0 x 3
## # Groups:   country [0]
## # ... with 3 variables: country <chr>, iso2 <chr>, iso3 <chr>
```

When we group together the three columns country, iso2 and iso3, and try to find unique rows from the data, we found that none of the values in the columns have different values from each other, therefore these three columns are redundant.

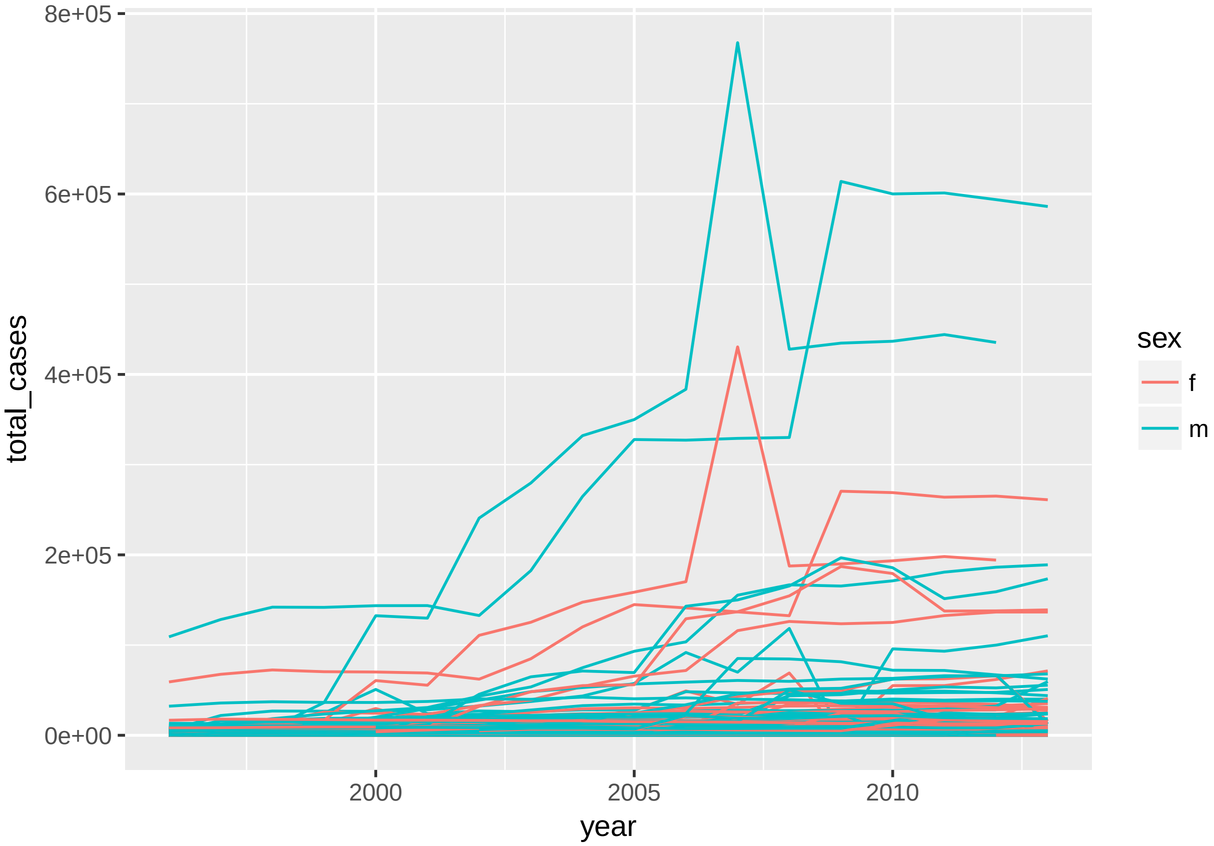
(4) For each country, year, and sex compute the total number of cases of TB. Make an informative visualisation of the data.

```
who5 %>%
  group_by(country,sex,year) %>%
  summarize(total_cases=sum(cases))
```

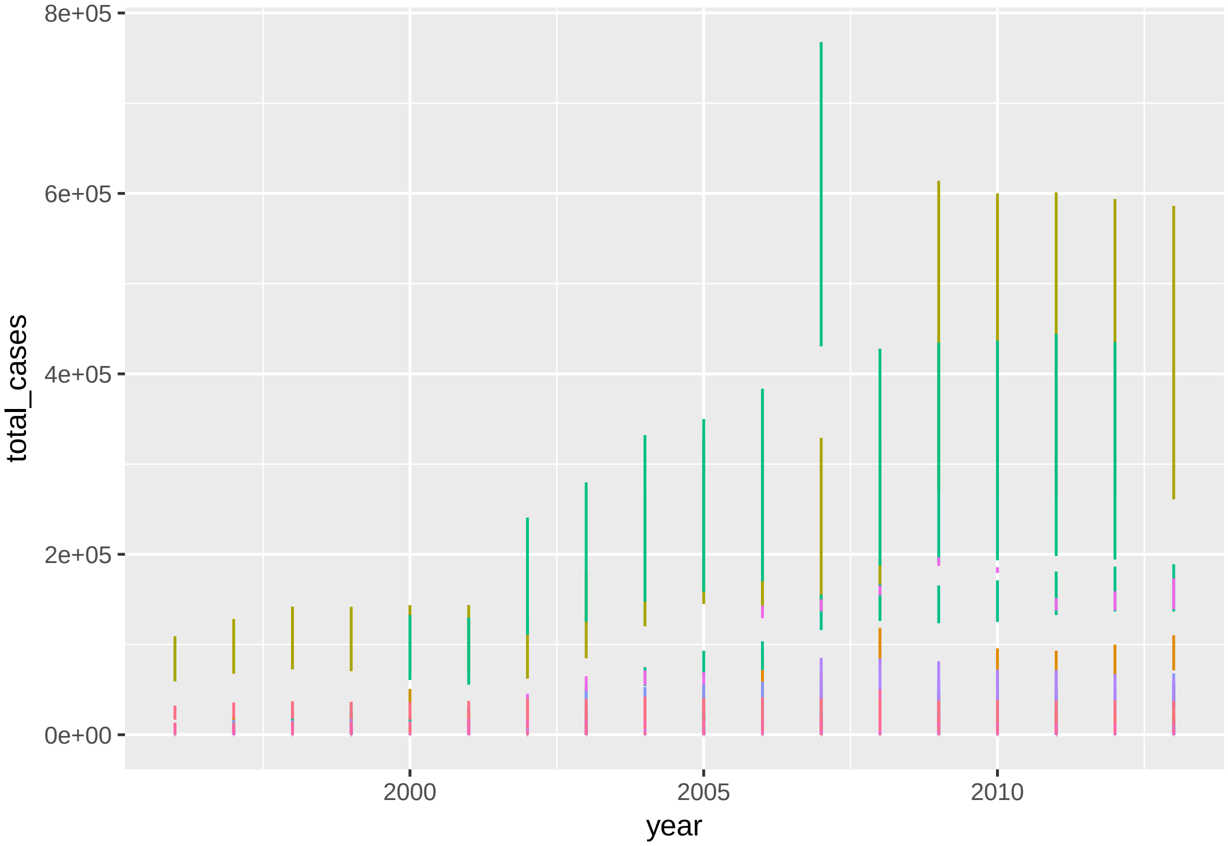
```
## # A tibble: 6,921 x 4
## # Groups:   country, sex [?]
##    country     sex    year total_cases
##    <chr>       <chr> <int>       <int>
##  1 Afghanistan f      1997         102
##  2 Afghanistan f      1998        1207
##  3 Afghanistan f      1999         517
##  4 Afghanistan f      2000        1751
##  5 Afghanistan f      2001        3062
##  6 Afghanistan f      2002        4418
##  7 Afghanistan f      2003        4423
##  8 Afghanistan f      2004        5587
##  9 Afghanistan f      2005        6818
## 10 Afghanistan f      2006        8520
## # ... with 6,911 more rows
```

```
# Total_cases gives the total number of cases of TB for each country, each sex in each year
```

```
who5 %>%
  group_by(country, year, sex) %>%
  filter(year > 1995) %>%
  summarise(total_cases=sum(cases)) %>%
  unite(country_sex, country, sex, remove = FALSE) %>%
  ggplot(aes(x = year, y = total_cases, group = country_sex, color = sex)) +
  geom_line()
```



```
who5 %>%
  group_by(country, year, sex) %>%
  filter(year > 1995) %>%
  summarise(total_cases=sum(cases)) %>%
  unite(year_country, year, country, remove = FALSE) %>%
  ggplot(aes(x = year, y = total_cases, group = year_country, color = country)) +
  geom_line(show.legend = FALSE)
```



Looking at both graph, the first one shows that amount of cases of TB found in male seems to be more than female. From the second graph, we can see that the number of TB cases is especially high around the year of 2007.

### 10.5 : problem 5

(5) What does $tibble : enframe()$ do? When might you use it?

```
x <- c(m=2,n=9)
tibble::enframe(x)
```

```
## # A tibble: 2 x 2
##   name  value
##   <chr> <dbl>
## 1 m      2.00
## 2 n      9.00
```

tibble::enframe() turns a vector with names into a tibble with two columns,as shown from above. You can use it when you have a named data vector,and you want to add that to another data frame.

### Tidy Data Article :

3) table 4 to table 6

```
# Get data from github for table 4

library(foreign)
```

```r
library(stringr)
library(plyr)
```

```
## ------------------------------------------------------------------------
## You have loaded plyr after dplyr - this is likely to cause problems.
## If you need functions from both plyr and dplyr, please load plyr first, then dplyr:
## library(plyr); library(dplyr)
## ------------------------------------------------------------------------
##
## Attaching package: 'plyr'
## The following objects are masked from 'package:dplyr':
##
##     arrange, count, desc, failwith, id, mutate, rename, summarise,
##     summarize
## The following object is masked from 'package:purrr':
##
##     compact
```

```r
library(reshape2)
```

```
##
## Attaching package: 'reshape2'
## The following object is masked from 'package:tidyr':
##
##     smiths
```

```r
source("xtable.r")

# Data from http://pewforum.org/Datasets/Dataset-Download.aspx

# Load data -----------------------------------------------------------------

pew <- read.spss("pew.sav")
```

```
## re-encoding from CP1252
## Warning in read.spss("pew.sav"): Undeclared level(s) 2, 3, 4, 9 added in
## variable: density3
## Warning in read.spss("pew.sav"): Duplicated levels in factor denom:
## Electronic ministries
## Warning in read.spss("pew.sav"): Undeclared level(s) 1, 2, 3, 4, 5, 6, 7,
## 8, 9, 10, 11, 12, 14, 16, 23, 33 added in variable: children
## Warning in read.spss("pew.sav"): Undeclared level(s) 18, 19, 20, 21, 22,
## 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41,
## 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60,
## 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79,
## 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96 added in
## variable: age
```

```r
pew <- as.data.frame(pew)
```

```r
religion <- pew[c("q16", "reltrad", "income")]
religion$reltrad <- as.character(religion$reltrad)
religion$reltrad <- str_replace(religion$reltrad, " Churches", "")
religion$reltrad <- str_replace(religion$reltrad, " Protestant", " Prot")
religion$reltrad[religion$q16 == " Atheist (do not believe in God) "] <- "Atheist"
religion$reltrad[religion$q16 == " Agnostic (not sure if there is a God) "] <- "Agnostic"
religion$reltrad <- str_trim(religion$reltrad)
religion$reltrad <- str_replace_all(religion$reltrad, " \\(.*?\\)", "")

religion$income <- c("Less than $10,000" = "<$10k",
  "10 to under $20,000" = "$10-20k",
  "20 to under $30,000" = "$20-30k",
  "30 to under $40,000" = "$30-40k",
  "40 to under $50,000" = "$40-50k",
  "50 to under $75,000" = "$50-75k",
  "75 to under $100,000" = "$75-100k",
  "100 to under $150,000" = "$100-150k",
  "$150,000 or more" = ">150k",
  "Don't know/Refused (VOL)" = "Don't know/refused")[religion$income]

religion$income <- factor(religion$income, levels = c("<$10k", "$10-20k", "$20-30k", "$30-40k", "$40-50
  "$75-100k", "$100-150k", ">150k", "Don't know/refused"))

counts <- count(religion, c("reltrad", "income"))
names(counts)[1] <- "religion"

xtable(counts[1:10, ], file = "pew-clean.tex")

# Convert into the form in which I originally saw it -------------------------

raw <- dcast(counts, religion ~ income)
```

```
## Using freq as value column: use value.var to override.
```

```r
xtable(raw[1:10, 1:7], file = "pew-raw.tex")

table4 <- raw
table4
```

```
##                    religion <$10k $10-20k $20-30k $30-40k $40-50k $50-75k
## 1                  Agnostic    27      34      60      81      76     137
## 2                   Atheist    12      27      37      52      35      70
## 3                  Buddhist    27      21      30      34      33      58
## 4                  Catholic   418     617     732     670     638    1116
## 5        Don’t know/refused    15      14      15      11      10      35
## 6          Evangelical Prot   575     869    1064     982     881    1486
## 7                     Hindu     1       9       7       9      11      34
## 8   Historically Black Prot   228     244     236     238     197     223
## 9         Jehovah's Witness    20      27      24      24      21      30
## 10                   Jewish    19      19      25      25      30      95
## 11            Mainline Prot   289     495     619     655     651    1107
## 12                   Mormon    29      40      48      51      56     112
## 13                   Muslim     6       7       9      10       9      23
## 14                 Orthodox    13      17      23      32      32      47
## 15         Other Christian     9       7      11      13      13      14
## 16            Other Faiths    20      33      40      46      49      63
## 17   Other World Religions     5       2       3       4       2       7
## 18            Unaffiliated   217     299     374     365     341     528
##    $75-100k $100-150k >150k Don't know/refused
## 1        122       109    84                 96
## 2         73        59    74                 76
## 3         62        39    53                 54
## 4        949       792   633               1489
## 5         21        17    18                116
## 6        949       723   414               1529
## 7         47        48    54                 37
## 8        131        81    78                339
## 9         15        11     6                 37
## 10        69        87   151                162
## 11       939       753   634               1328
## 12        85        49    42                 69
## 13        16         8     6                 22
## 14        38        42    46                 73
## 15        18        14    12                 18
## 16        46        40    41                 71
## 17         3         4     4                  8
## 18       407       321   258                597
```

```
# Turning table 4 to table 6

a <- melt(data=table4)
```

```
## Using religion as id variables
```

```
a <- a[order(a["religion"]),]
colnames(a)[colnames(a)=="variable"] <- "income"
colnames(a)[colnames(a)=="value"] <- "freq"
arrange(a,religion,income,freq)
```

```
##                      religion             income freq
## 1                    Agnostic              <$10k   27
## 2                    Agnostic            $10-20k   34
## 3                    Agnostic            $20-30k   60
## 4                    Agnostic            $30-40k   81
## 5                    Agnostic            $40-50k   76
## 6                    Agnostic            $50-75k  137
## 7                    Agnostic           $75-100k  122
## 8                    Agnostic          $100-150k  109
## 9                    Agnostic              >150k   84
## 10                   Agnostic Don't know/refused   96
## 11                    Atheist              <$10k   12
## 12                    Atheist            $10-20k   27
## 13                    Atheist            $20-30k   37
## 14                    Atheist            $30-40k   52
## 15                    Atheist            $40-50k   35
## 16                    Atheist            $50-75k   70
## 17                    Atheist           $75-100k   73
## 18                    Atheist          $100-150k   59
## 19                    Atheist              >150k   74
## 20                    Atheist Don't know/refused   76
## 21                 Buddhist              <$10k   27
## 22                 Buddhist            $10-20k   21
## 23                 Buddhist            $20-30k   30
## 24                 Buddhist            $30-40k   34
## 25                 Buddhist            $40-50k   33
## 26                 Buddhist            $50-75k   58
## 27                 Buddhist           $75-100k   62
## 28                 Buddhist          $100-150k   39
## 29                 Buddhist              >150k   53
## 30                 Buddhist Don't know/refused   54
## 31                 Catholic              <$10k  418
## 32                 Catholic            $10-20k  617
## 33                 Catholic            $20-30k  732
## 34                 Catholic            $30-40k  670
## 35                 Catholic            $40-50k  638
## 36                 Catholic            $50-75k 1116
## 37                 Catholic           $75-100k  949
## 38                 Catholic          $100-150k  792
## 39                 Catholic              >150k  633
## 40                 Catholic Don't know/refused 1489
## 41       Don’t know/refused              <$10k   15
## 42       Don’t know/refused            $10-20k   14
## 43       Don’t know/refused            $20-30k   15
## 44       Don’t know/refused            $30-40k   11
## 45       Don’t know/refused            $40-50k   10
## 46       Don’t know/refused            $50-75k   35
## 47       Don’t know/refused           $75-100k   21
## 48       Don’t know/refused          $100-150k   17
## 49       Don’t know/refused              >150k   18
## 50       Don’t know/refused Don't know/refused  116
## 51         Evangelical Prot              <$10k  575
## 52         Evangelical Prot            $10-20k  869
## 53         Evangelical Prot            $20-30k 1064
## 54         Evangelical Prot            $30-40k  982
## 55         Evangelical Prot            $40-50k  881
## 56         Evangelical Prot            $50-75k 1486
## 57         Evangelical Prot           $75-100k  949
## 58         Evangelical Prot          $100-150k  723
## 59         Evangelical Prot              >150k  414
## 60         Evangelical Prot Don't know/refused 1529
## 61                    Hindu              <$10k    1
## 62                    Hindu            $10-20k    9
## 63                    Hindu            $20-30k    7
## 64                    Hindu            $30-40k    9
## 65                    Hindu            $40-50k   11
## 66                    Hindu            $50-75k   34
## 67                    Hindu           $75-100k   47
## 68                    Hindu          $100-150k   48
## 69                    Hindu              >150k   54
## 70                    Hindu Don't know/refused   37
## 71  Historically Black Prot              <$10k  228
## 72  Historically Black Prot            $10-20k  244
## 73  Historically Black Prot            $20-30k  236
## 74  Historically Black Prot            $30-40k  238
## 75  Historically Black Prot            $40-50k  197
## 76  Historically Black Prot            $50-75k  223
## 77  Historically Black Prot           $75-100k  131
## 78  Historically Black Prot          $100-150k   81
## 79  Historically Black Prot              >150k   78
## 80  Historically Black Prot Don't know/refused  339
## 81        Jehovah's Witness              <$10k   20
## 82        Jehovah's Witness            $10-20k   27
## 83        Jehovah's Witness            $20-30k   24
## 84        Jehovah's Witness            $30-40k   24
## 85        Jehovah's Witness            $40-50k   21
## 86        Jehovah's Witness            $50-75k   30
## 87        Jehovah's Witness           $75-100k   15
## 88        Jehovah's Witness          $100-150k   11
## 89        Jehovah's Witness              >150k    6
## 90        Jehovah's Witness Don't know/refused   37
## 91                   Jewish              <$10k   19
## 92                   Jewish            $10-20k   19
## 93                   Jewish            $20-30k   25
## 94                   Jewish            $30-40k   25
## 95                   Jewish            $40-50k   30
## 96                   Jewish            $50-75k   95
## 97                   Jewish           $75-100k   69
## 98                   Jewish          $100-150k   87
## 99                   Jewish              >150k  151
## 100                  Jewish Don't know/refused  162
## 101           Mainline Prot              <$10k  289
## 102           Mainline Prot            $10-20k  495
## 103           Mainline Prot            $20-30k  619
## 104           Mainline Prot            $30-40k  655
## 105           Mainline Prot            $40-50k  651
## 106           Mainline Prot            $50-75k 1107
## 107           Mainline Prot           $75-100k  939
## 108           Mainline Prot          $100-150k  753
## 109           Mainline Prot              >150k  634
## 110           Mainline Prot Don't know/refused 1328
## 111                  Mormon              <$10k   29
## 112                  Mormon            $10-20k   40
## 113                  Mormon            $20-30k   48
## 114                  Mormon            $30-40k   51
## 115                  Mormon            $40-50k   56
## 116                  Mormon            $50-75k  112
## 117                  Mormon           $75-100k   85
## 118                  Mormon          $100-150k   49
## 119                  Mormon              >150k   42
## 120                  Mormon Don't know/refused   69
## 121                  Muslim              <$10k    6
## 122                  Muslim            $10-20k    7
## 123                  Muslim            $20-30k    9
## 124                  Muslim            $30-40k   10
## 125                  Muslim            $40-50k    9
## 126                  Muslim            $50-75k   23
## 127                  Muslim           $75-100k   16
## 128                  Muslim          $100-150k    8
## 129                  Muslim              >150k    6
## 130                  Muslim Don't know/refused   22
## 131                Orthodox              <$10k   13
## 132                Orthodox            $10-20k   17
## 133                Orthodox            $20-30k   23
## 134                Orthodox            $30-40k   32
## 135                Orthodox            $40-50k   32
## 136                Orthodox            $50-75k   47
## 137                Orthodox           $75-100k   38
## 138                Orthodox          $100-150k   42
## 139                Orthodox              >150k   46
## 140                Orthodox Don't know/refused   73
## 141         Other Christian              <$10k    9
## 142         Other Christian            $10-20k    7
## 143         Other Christian            $20-30k   11
## 144         Other Christian            $30-40k   13
## 145         Other Christian            $40-50k   13
## 146         Other Christian            $50-75k   14
## 147         Other Christian           $75-100k   18
## 148         Other Christian          $100-150k   14
## 149         Other Christian              >150k   12
## 150         Other Christian Don't know/refused   18
## 151            Other Faiths              <$10k   20
## 152            Other Faiths            $10-20k   33
## 153            Other Faiths            $20-30k   40
## 154            Other Faiths            $30-40k   46
## 155            Other Faiths            $40-50k   49
## 156            Other Faiths            $50-75k   63
## 157            Other Faiths           $75-100k   46
## 158            Other Faiths          $100-150k   40
## 159            Other Faiths              >150k   41
## 160            Other Faiths Don't know/refused   71
## 161   Other World Religions              <$10k    5
## 162   Other World Religions            $10-20k    2
## 163   Other World Religions            $20-30k    3
## 164   Other World Religions            $30-40k    4
## 165   Other World Religions            $40-50k    2
## 166   Other World Religions            $50-75k    7
## 167   Other World Religions           $75-100k    3
## 168   Other World Religions          $100-150k    4
## 169   Other World Religions              >150k    4
## 170   Other World Religions Don't know/refused    8
## 171            Unaffiliated              <$10k  217
## 172            Unaffiliated            $10-20k  299
## 173            Unaffiliated            $20-30k  374
## 174            Unaffiliated            $30-40k  365
## 175            Unaffiliated            $40-50k  341
## 176            Unaffiliated            $50-75k  528
## 177            Unaffiliated           $75-100k  407
## 178            Unaffiliated          $100-150k  321
## 179            Unaffiliated              >150k  258
## 180            Unaffiliated Don't know/refused  597
```

4) table 7 to table 8

```
# Get data from github for table 7

options(stringsAsFactors = FALSE)
library(lubridate)
```

```
##
## Attaching package: 'lubridate'

## The following object is masked from 'package:plyr':
##
##     here

## The following object is masked from 'package:base':
##
##     date
```

```
library(reshape2)
library(stringr)
library(plyr)
source("xtable.r")

raw <- read.csv("billboard.csv")
raw <- raw[, c("year", "artist.inverted", "track", "time", "date.entered", "x1st.week", "x2nd.week", "x3
names(raw)[2] <- "artist"

raw$artist <- iconv(raw$artist, "MAC", "ASCII//translit")
raw$track <- str_replace(raw$track, " \\(.*?\\)", "")
names(raw)[-(1:5)] <- str_c("wk", 1:76)
raw <- arrange(raw, year, artist, track)
```

```
# Table 7
head(raw)
```

```
##   year       artist                           track time date.entered wk1
## 1 2000        2 Pac                  Baby Don't Cry 4:22   2000-02-26  87
## 2 2000      2Ge+her The Hardest Part Of Breaking Up 3:15   2000-09-02  91
## 3 2000 3 Doors Down                      Kryptonite 3:53   2000-04-08  81
## 4 2000 3 Doors Down                           Loser 4:24   2000-10-21  76
## 5 2000     504 Boyz                   Wobble Wobble 3:35   2000-04-15  57
## 6 2000         98^0          Give Me Just One Night 3:24   2000-08-19  51
##   wk2 wk3 wk4 wk5 wk6 wk7 wk8 wk9 wk10 wk11 wk12 wk13 wk14 wk15 wk16 wk17
## 1  82  72  77  87  94  99  NA  NA   NA   NA   NA   NA   NA   NA   NA   NA
## 2  87  92  NA  NA  NA  NA  NA  NA   NA   NA   NA   NA   NA   NA   NA   NA
## 3  70  68  67  66  57  54  53  51   51   51   51   47   44   38   28   22
## 4  76  72  69  67  65  55  59  62   61   61   59   61   66   72   76   75
## 5  34  25  17  17  31  36  49  53   57   64   70   75   76   78   85   92
## 6  39  34  26  26  19   2   2   3    6    7   22   29   36   47   67   66
##   wk18 wk19 wk20 wk21 wk22 wk23 wk24 wk25 wk26 wk27 wk28 wk29 wk30 wk31
## 1   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
## 2   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
## 3   18   18   14   12    7    6    6    6    5    5    4    4    4    4
## 4   67   73   70   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
## 5   96   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
## 6   84   93   94   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
##   wk32 wk33 wk34 wk35 wk36 wk37 wk38 wk39 wk40 wk41 wk42 wk43 wk44 wk45
## 1   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
## 2   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
## 3    3    3    3    4    5    5    9    9   15   14   13   14   16   17
## 4   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
## 5   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
## 6   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
##   wk46 wk47 wk48 wk49 wk50 wk51 wk52 wk53 wk54 wk55 wk56 wk57 wk58 wk59
## 1   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
## 2   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
## 3   21   22   24   28   33   42   42   49   NA   NA   NA   NA   NA   NA
## 4   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
## 5   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
## 6   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
##   wk60 wk61 wk62 wk63 wk64 wk65 wk66 wk67 wk68 wk69 wk70 wk71 wk72 wk73
## 1   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
## 2   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
## 3   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
## 4   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
## 5   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
## 6   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA   NA
##   wk74 wk75 wk76
## 1   NA   NA   NA
## 2   NA   NA   NA
## 3   NA   NA   NA
## 4   NA   NA   NA
## 5   NA   NA   NA
## 6   NA   NA   NA
```

```r
# Table 8
x <- melt(raw, id = 1:5, na.rm = T)
x$week <- as.integer(str_replace_all(x$variable, "[^0-9]+", ""))
x <- x[order(x["artist"]),]
colnames(x)[7] <- "rank"
x$date <- ymd(x$date)
x$date <- x$date + weeks(x$week - 1)
x <- arrange(x, year, artist, track, time, week)
x <-  x[c("year", "artist", "time", "track", "date", "week", "rank")]
head(x)
```

```
##   year artist time          track       date week rank
## 1 2000  2 Pac 4:22 Baby Don't Cry 2000-02-26    1   87
## 2 2000  2 Pac 4:22 Baby Don't Cry 2000-03-04    2   82
## 3 2000  2 Pac 4:22 Baby Don't Cry 2000-03-11    3   72
## 4 2000  2 Pac 4:22 Baby Don't Cry 2000-03-18    4   77
## 5 2000  2 Pac 4:22 Baby Don't Cry 2000-03-25    5   87
## 6 2000  2 Pac 4:22 Baby Don't Cry 2000-04-01    6   94
```