test1result.R

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```
setwd("~/Research/test1/refineassignment")
refinesheet<-read.csv("C:/Users/IBM_ADMIN/Desktop/refine.xlsx - Sheet1.csv")
library(dplyr)
```

```
## Warning: package 'dplyr' was built under R version 3.2.5
```

```
##
## Attaching package: 'dplyr'
```

```
## The following objects are masked from 'package:stats':
##
##     filter, lag
```

```
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
library(tidyr)
```

```
## Warning: package 'tidyr' was built under R version 3.2.5
```

```
separate(refinesheet,Product.code...number,c("Productcode","Number"))
```

```
##         company Productcode Number              address   city
## 1     Philips           p      5 Groningensingel 147 arnhem
## 2     Philips           p     43 Groningensingel 148 arnhem
## 3     Philips           x      3 Groningensingel 149 arnhem
## 4     Philips           x     34 Groningensingel 150 arnhem
## 5     Philips           x     12 Groningensingel 151 arnhem
## 6     Philips           p     23 Groningensingel 152 arnhem
## 7        akzo           v     43    Leeuwardenweg 178 arnhem
## 8        akzo           v     12    Leeuwardenweg 179 arnhem
## 9        akzo           x      5    Leeuwardenweg 180 arnhem
## 10       akzo           p     34    Leeuwardenweg 181 arnhem
## 11       akzo           q      5    Leeuwardenweg 182 arnhem
## 12       akzo           q      9    Leeuwardenweg 183 arnhem
## 13       akzo           x      8    Leeuwardenweg 184 arnhem
## 14    Philips           p     56    Delfzijlstraat 54 arnhem
## 15    Philips           v     67    Delfzijlstraat 55 arnhem
## 16    Philips           v     21    Delfzijlstraat 56 arnhem
## 17 Van Houten           x     45    Delfzijlstraat 57 arnhem
## 18 Van Houten           v     56    Delfzijlstraat 58 arnhem
## 19 Van Houten           v     65    Delfzijlstraat 59 arnhem
## 20 Van Houten           x     21    Delfzijlstraat 60 arnhem
## 21 Van Houten           p     23    Delfzijlstraat 61 arnhem
## 22    unilver           x      3      Jourestraat 23 arnhem
## 23   unilever           q      4      Jourestraat 24 arnhem
## 24   unilever           q      6      Jourestraat 25 arnhem
## 25   unilever           q      8      Jourestraat 26 arnhem
##             country            name
## 1  the netherlands    dhr p. jansen
## 2  the netherlands    dhr p. hansen
## 3  the netherlands    dhr j. Gansen
## 4  the netherlands    dhr p. mansen
## 5  the netherlands   dhr p. fransen
## 6  the netherlands  dhr p. franssen
## 7  the netherlands    dhr p. bansen
## 8  the netherlands    dhr p. vansen
## 9  the netherlands   dhr p. bransen
## 10 the netherlands   dhr p. janssen
## 11 the netherlands   mevr l.  rokken
## 12 the netherlands   mevr l.  lokken
## 13 the netherlands   mevr l.  mokken
## 14 the netherlands   mevr l.  mokken
## 15 the netherlands   mevr l.  mokken
## 16 the netherlands   mevr l.  mokken
## 17 the netherlands   mevr l.  sokken
## 18 the netherlands   mevr l.  wokken
## 19 the netherlands   mevr l.  kokken
## 20 the netherlands   mevr l.  Bokken
## 21 the netherlands   mevr l.  dokken
## 22 the netherlands   mevr l.  gokken
## 23 the netherlands mevr l.  stokken
```

```
## 24 the netherlands  mevr l.  rokken
## 25 the netherlands  mevr l.  rokken
```

```
refinesheet2<-refinesheet%>% separate(Product.code...number,c("Productcode","Number")
)
str(refinesheet2)
```

```
## 'data.frame':    25 obs. of  7 variables:
##  $ company    : Factor w/ 5 levels "akzo","Philips",..: 2 2 2 2 2 2 1 1 1 1 ...
##  $ Productcode: chr  "p" "p" "x" "x" ...
##  $ Number     : chr  "5" "43" "3" "34" ...
##  $ address    : Factor w/ 25 levels "Delfzijlstraat 54",..: 9 10 11 12 13 14 19 20
 21 22 ...
##  $ city       : Factor w/ 1 level "arnhem": 1 1 1 1 1 1 1 1 1 1 1 ...
##  $ country    : Factor w/ 1 level "the netherlands": 1 1 1 1 1 1 1 1 1 1 1 ...
##  $ name       : Factor w/ 20 levels "dhr j. Gansen",..: 7 6 1 9 4 5 2 10 3 8 ...
```

```
print(refinesheet2)
```

```
##         company Productcode Number            address   city
## 1     Philips           p      5 Groningensingel 147 arnhem
## 2     Philips           p     43 Groningensingel 148 arnhem
## 3     Philips           x      3 Groningensingel 149 arnhem
## 4     Philips           x     34 Groningensingel 150 arnhem
## 5     Philips           x     12 Groningensingel 151 arnhem
## 6     Philips           p     23 Groningensingel 152 arnhem
## 7        akzo           v     43    Leeuwardenweg 178 arnhem
## 8        akzo           v     12    Leeuwardenweg 179 arnhem
## 9        akzo           x      5    Leeuwardenweg 180 arnhem
## 10       akzo           p     34    Leeuwardenweg 181 arnhem
## 11       akzo           q      5    Leeuwardenweg 182 arnhem
## 12       akzo           q      9    Leeuwardenweg 183 arnhem
## 13       akzo           x      8    Leeuwardenweg 184 arnhem
## 14    Philips           p     56    Delfzijlstraat 54 arnhem
## 15    Philips           v     67    Delfzijlstraat 55 arnhem
## 16    Philips           v     21    Delfzijlstraat 56 arnhem
## 17 Van Houten           x     45    Delfzijlstraat 57 arnhem
## 18 Van Houten           v     56    Delfzijlstraat 58 arnhem
## 19 Van Houten           v     65    Delfzijlstraat 59 arnhem
## 20 Van Houten           x     21    Delfzijlstraat 60 arnhem
## 21 Van Houten           p     23    Delfzijlstraat 61 arnhem
## 22   unilver           x      3       Jourestraat 23 arnhem
## 23  unilever           q      4       Jourestraat 24 arnhem
## 24  unilever           q      6       Jourestraat 25 arnhem
## 25  unilever           q      8       Jourestraat 26 arnhem
##            country             name
## 1  the netherlands    dhr p. jansen
## 2  the netherlands    dhr p. hansen
## 3  the netherlands    dhr j. Gansen
## 4  the netherlands    dhr p. mansen
## 5  the netherlands   dhr p. fransen
## 6  the netherlands  dhr p. franssen
## 7  the netherlands    dhr p. bansen
## 8  the netherlands    dhr p. vansen
## 9  the netherlands   dhr p. bransen
## 10 the netherlands   dhr p. janssen
## 11 the netherlands  mevr l.  rokken
## 12 the netherlands  mevr l.  lokken
## 13 the netherlands  mevr l.  mokken
## 14 the netherlands  mevr l.  mokken
## 15 the netherlands  mevr l.  mokken
## 16 the netherlands  mevr l.  mokken
## 17 the netherlands  mevr l.  sokken
## 18 the netherlands  mevr l.  wokken
## 19 the netherlands  mevr l.  kokken
## 20 the netherlands  mevr l.  Bokken
## 21 the netherlands  mevr l.  dokken
## 22 the netherlands  mevr l.  gokken
## 23 the netherlands mevr l.  stokken
```

```
## 24 the netherlands  mevr l.  rokken
## 25 the netherlands  mevr l.  rokken
```

```
f<-data.frame(productcat=c("Smartphone","TV","Laptop","Tablet"),Productcode=c("p","v"
,"x","q"))
print(f)
```

```
##   productcat Productcode
## 1 Smartphone           p
## 2         TV           v
## 3     Laptop           x
## 4     Tablet           q
```

```
left_join(f,refinesheet2,by="Productcode")
```

```
## Warning in left_join_impl(x, y, by$x, by$y): joining character vector and
## factor, coercing into character vector
```

```
##      productcat Productcode    company Number              address    city
## 1    Smartphone           p    Philips      5 Groningensingel 147 arnhem
## 2    Smartphone           p    Philips     43 Groningensingel 148 arnhem
## 3    Smartphone           p    Philips     23 Groningensingel 152 arnhem
## 4    Smartphone           p       akzo     34    Leeuwardenweg 181 arnhem
## 5    Smartphone           p    Philips     56    Delfzijlstraat 54 arnhem
## 6    Smartphone           p Van Houten     23    Delfzijlstraat 61 arnhem
## 7            TV           v       akzo     43    Leeuwardenweg 178 arnhem
## 8            TV           v       akzo     12    Leeuwardenweg 179 arnhem
## 9            TV           v    Philips     67    Delfzijlstraat 55 arnhem
## 10           TV           v    Philips     21    Delfzijlstraat 56 arnhem
## 11           TV           v Van Houten     56    Delfzijlstraat 58 arnhem
## 12           TV           v Van Houten     65    Delfzijlstraat 59 arnhem
## 13       Laptop           x    Philips      3 Groningensingel 149 arnhem
## 14       Laptop           x    Philips     34 Groningensingel 150 arnhem
## 15       Laptop           x    Philips     12 Groningensingel 151 arnhem
## 16       Laptop           x       akzo      5    Leeuwardenweg 180 arnhem
## 17       Laptop           x       akzo      8    Leeuwardenweg 184 arnhem
## 18       Laptop           x Van Houten     45    Delfzijlstraat 57 arnhem
## 19       Laptop           x Van Houten     21    Delfzijlstraat 60 arnhem
## 20       Laptop           x    unilver      3        Jourestraat 23 arnhem
## 21       Tablet           q       akzo      5    Leeuwardenweg 182 arnhem
## 22       Tablet           q       akzo      9    Leeuwardenweg 183 arnhem
## 23       Tablet           q   unilever      4        Jourestraat 24 arnhem
## 24       Tablet           q   unilever      6        Jourestraat 25 arnhem
## 25       Tablet           q   unilever      8        Jourestraat 26 arnhem
##             country            name
## 1  the netherlands    dhr p. jansen
## 2  the netherlands    dhr p. hansen
## 3  the netherlands  dhr p. franssen
## 4  the netherlands   dhr p. janssen
## 5  the netherlands  mevr l.  mokken
## 6  the netherlands  mevr l.  dokken
## 7  the netherlands    dhr p. bansen
## 8  the netherlands    dhr p. vansen
## 9  the netherlands  mevr l.  mokken
## 10 the netherlands  mevr l.  mokken
## 11 the netherlands  mevr l.  wokken
## 12 the netherlands  mevr l.  kokken
## 13 the netherlands   dhr j. Gansen
## 14 the netherlands   dhr p. mansen
## 15 the netherlands  dhr p. fransen
## 16 the netherlands  dhr p. bransen
## 17 the netherlands  mevr l.  mokken
## 18 the netherlands  mevr l.  sokken
## 19 the netherlands  mevr l.  Bokken
## 20 the netherlands  mevr l.  gokken
## 21 the netherlands  mevr l.  rokken
## 22 the netherlands  mevr l.  lokken
## 23 the netherlands mevr l.  stokken
```

```
## 24 the netherlands  mevr l.  rokken
## 25 the netherlands  mevr l.  rokken
```

```
refinesheet3<-left_join(f,refinesheet2,by="Productcode")
```

```
## Warning in left_join_impl(x, y, by$x, by$y): joining character vector and
## factor, coercing into character vector
```

```
print(refinesheet3)
```

```
##    productcat Productcode    company Number            address    city
## 1  Smartphone           p    Philips      5 Groningensingel 147 arnhem
## 2  Smartphone           p    Philips     43 Groningensingel 148 arnhem
## 3  Smartphone           p    Philips     23 Groningensingel 152 arnhem
## 4  Smartphone           p       akzo     34    Leeuwardenweg 181 arnhem
## 5  Smartphone           p    Philips     56     Delfzijlstraat 54 arnhem
## 6  Smartphone           p Van Houten     23     Delfzijlstraat 61 arnhem
## 7          TV           v       akzo     43    Leeuwardenweg 178 arnhem
## 8          TV           v       akzo     12    Leeuwardenweg 179 arnhem
## 9          TV           v    Philips     67     Delfzijlstraat 55 arnhem
## 10         TV           v    Philips     21     Delfzijlstraat 56 arnhem
## 11         TV           v Van Houten     56     Delfzijlstraat 58 arnhem
## 12         TV           v Van Houten     65     Delfzijlstraat 59 arnhem
## 13     Laptop           x    Philips      3 Groningensingel 149 arnhem
## 14     Laptop           x    Philips     34 Groningensingel 150 arnhem
## 15     Laptop           x    Philips     12 Groningensingel 151 arnhem
## 16     Laptop           x       akzo      5    Leeuwardenweg 180 arnhem
## 17     Laptop           x       akzo      8    Leeuwardenweg 184 arnhem
## 18     Laptop           x Van Houten     45     Delfzijlstraat 57 arnhem
## 19     Laptop           x Van Houten     21     Delfzijlstraat 60 arnhem
## 20     Laptop           x    unilver      3       Jourestraat 23 arnhem
## 21     Tablet           q       akzo      5    Leeuwardenweg 182 arnhem
## 22     Tablet           q       akzo      9    Leeuwardenweg 183 arnhem
## 23     Tablet           q   unilever      4       Jourestraat 24 arnhem
## 24     Tablet           q   unilever      6       Jourestraat 25 arnhem
## 25     Tablet           q   unilever      8       Jourestraat 26 arnhem
##              country             name
## 1  the netherlands    dhr p. jansen
## 2  the netherlands    dhr p. hansen
## 3  the netherlands  dhr p. franssen
## 4  the netherlands   dhr p. janssen
## 5  the netherlands  mevr l.  mokken
## 6  the netherlands  mevr l.  dokken
## 7  the netherlands    dhr p. bansen
## 8  the netherlands    dhr p. vansen
## 9  the netherlands  mevr l.  mokken
## 10 the netherlands  mevr l.  mokken
## 11 the netherlands  mevr l.  wokken
## 12 the netherlands  mevr l.  kokken
## 13 the netherlands   dhr j. Gansen
## 14 the netherlands    dhr p. mansen
## 15 the netherlands   dhr p. fransen
## 16 the netherlands   dhr p. bransen
## 17 the netherlands  mevr l.  mokken
## 18 the netherlands  mevr l.  sokken
## 19 the netherlands  mevr l.  Bokken
## 20 the netherlands  mevr l.  gokken
## 21 the netherlands  mevr l.  rokken
## 22 the netherlands  mevr l.  lokken
## 23 the netherlands mevr l.  stokken
```

```
## 24 the netherlands  mevr l.  rokken
## 25 the netherlands  mevr l.  rokken
```

```
str(refinesheet3)
```

```
## 'data.frame':    25 obs. of  8 variables:
##  $ productcat : Factor w/ 4 levels "Laptop","Smartphone",..: 2 2 2 2 2 2 4 4 4 4 .
..
##  $ Productcode: chr  "p" "p" "p" "p" ...
##  $ company    : Factor w/ 5 levels "akzo","Philips",..: 2 2 2 1 2 5 1 1 2 2 ...
##  $ Number     : chr  "5" "43" "23" "34" ...
##  $ address    : Factor w/ 25 levels "Delfzijlstraat 54",..: 9 10 14 22 1 8 19 20 2
 3 ...
##  $ city       : Factor w/ 1 level "arnhem": 1 1 1 1 1 1 1 1 1 1 1 ...
##  $ country    : Factor w/ 1 level "the netherlands": 1 1 1 1 1 1 1 1 1 1 1 ...
##  $ name       : Factor w/ 20 levels "dhr j. Gansen",..: 7 6 5 8 16 12 2 10 16 16 .
..
```

```
unite(refinesheet3,"full_address",address,city,country,sep="-")
```

```
##      productcat Productcode    company Number
## 1   Smartphone           p    Philips      5
## 2   Smartphone           p    Philips     43
## 3   Smartphone           p    Philips     23
## 4   Smartphone           p       akzo     34
## 5   Smartphone           p    Philips     56
## 6   Smartphone           p Van Houten     23
## 7           TV           v       akzo     43
## 8           TV           v       akzo     12
## 9           TV           v    Philips     67
## 10          TV           v    Philips     21
## 11          TV           v Van Houten     56
## 12          TV           v Van Houten     65
## 13      Laptop           x    Philips      3
## 14      Laptop           x    Philips     34
## 15      Laptop           x    Philips     12
## 16      Laptop           x       akzo      5
## 17      Laptop           x       akzo      8
## 18      Laptop           x Van Houten     45
## 19      Laptop           x Van Houten     21
## 20      Laptop           x    unilver      3
## 21      Tablet           q       akzo      5
## 22      Tablet           q       akzo      9
## 23      Tablet           q   unilever      4
## 24      Tablet           q   unilever      6
## 25      Tablet           q   unilever      8
##                                  full_address             name
## 1   Groningensingel 147-arnhem-the netherlands    dhr p. jansen
## 2   Groningensingel 148-arnhem-the netherlands    dhr p. hansen
## 3   Groningensingel 152-arnhem-the netherlands  dhr p. franssen
## 4     Leeuwardenweg 181-arnhem-the netherlands   dhr p. janssen
## 5     Delfzijlstraat 54-arnhem-the netherlands  mevr l.  mokken
## 6     Delfzijlstraat 61-arnhem-the netherlands  mevr l.  dokken
## 7     Leeuwardenweg 178-arnhem-the netherlands    dhr p. bansen
## 8     Leeuwardenweg 179-arnhem-the netherlands    dhr p. vansen
## 9     Delfzijlstraat 55-arnhem-the netherlands  mevr l.  mokken
## 10    Delfzijlstraat 56-arnhem-the netherlands  mevr l.  mokken
## 11    Delfzijlstraat 58-arnhem-the netherlands  mevr l.  wokken
## 12    Delfzijlstraat 59-arnhem-the netherlands  mevr l.  kokken
## 13  Groningensingel 149-arnhem-the netherlands   dhr j. Gansen
## 14  Groningensingel 150-arnhem-the netherlands   dhr p. mansen
## 15  Groningensingel 151-arnhem-the netherlands   dhr p. fransen
## 16    Leeuwardenweg 180-arnhem-the netherlands   dhr p. bransen
## 17    Leeuwardenweg 184-arnhem-the netherlands  mevr l.  mokken
## 18    Delfzijlstraat 57-arnhem-the netherlands  mevr l.  sokken
## 19    Delfzijlstraat 60-arnhem-the netherlands  mevr l.  Bokken
## 20       Jourestraat 23-arnhem-the netherlands  mevr l.  gokken
## 21    Leeuwardenweg 182-arnhem-the netherlands  mevr l.  rokken
## 22    Leeuwardenweg 183-arnhem-the netherlands  mevr l.  lokken
## 23       Jourestraat 24-arnhem-the netherlands mevr l.  stokken
```

```
## 24       Jourestraat 25-arnhem-the netherlands   mevr l.   rokken
## 25       Jourestraat 26-arnhem-the netherlands   mevr l.   rokken
```

```
refinesheet4<-unite(refinesheet3,"full_address",address,city,country,sep="-")
print(refinesheet4)
```

```
##       productcat Productcode    company Number
## 1    Smartphone           p     Philips      5
## 2    Smartphone           p     Philips     43
## 3    Smartphone           p     Philips     23
## 4    Smartphone           p        akzo     34
## 5    Smartphone           p     Philips     56
## 6    Smartphone           p Van Houten     23
## 7            TV            v        akzo     43
## 8            TV            v        akzo     12
## 9            TV            v     Philips     67
## 10           TV            v     Philips     21
## 11           TV            v Van Houten     56
## 12           TV            v Van Houten     65
## 13       Laptop           x     Philips      3
## 14       Laptop           x     Philips     34
## 15       Laptop           x     Philips     12
## 16       Laptop           x        akzo      5
## 17       Laptop           x        akzo      8
## 18       Laptop           x Van Houten     45
## 19       Laptop           x Van Houten     21
## 20       Laptop           x     unilver      3
## 21       Tablet           q        akzo      5
## 22       Tablet           q        akzo      9
## 23       Tablet           q    unilever      4
## 24       Tablet           q    unilever      6
## 25       Tablet           q    unilever      8
##                                  full_address            name
## 1   Groningensingel 147-arnhem-the netherlands   dhr p. jansen
## 2   Groningensingel 148-arnhem-the netherlands   dhr p. hansen
## 3   Groningensingel 152-arnhem-the netherlands dhr p. franssen
## 4     Leeuwardenweg 181-arnhem-the netherlands   dhr p. janssen
## 5     Delfzijlstraat 54-arnhem-the netherlands mevr l.  mokken
## 6     Delfzijlstraat 61-arnhem-the netherlands mevr l.  dokken
## 7     Leeuwardenweg 178-arnhem-the netherlands   dhr p. bansen
## 8     Leeuwardenweg 179-arnhem-the netherlands   dhr p. vansen
## 9     Delfzijlstraat 55-arnhem-the netherlands mevr l.  mokken
## 10    Delfzijlstraat 56-arnhem-the netherlands mevr l.  mokken
## 11    Delfzijlstraat 58-arnhem-the netherlands mevr l.  wokken
## 12    Delfzijlstraat 59-arnhem-the netherlands mevr l.  kokken
## 13  Groningensingel 149-arnhem-the netherlands   dhr j. Gansen
## 14  Groningensingel 150-arnhem-the netherlands   dhr p. mansen
## 15  Groningensingel 151-arnhem-the netherlands   dhr p. fransen
## 16    Leeuwardenweg 180-arnhem-the netherlands   dhr p. bransen
## 17    Leeuwardenweg 184-arnhem-the netherlands mevr l.  mokken
## 18    Delfzijlstraat 57-arnhem-the netherlands mevr l.  sokken
## 19    Delfzijlstraat 60-arnhem-the netherlands mevr l.  Bokken
## 20       Jourestraat 23-arnhem-the netherlands mevr l.  gokken
## 21    Leeuwardenweg 182-arnhem-the netherlands mevr l.  rokken
## 22    Leeuwardenweg 183-arnhem-the netherlands mevr l.  lokken
## 23       Jourestraat 24-arnhem-the netherlands mevr l.  stokken
```

```
## 24        Jourestraat 25-arnhem-the netherlands  mevr l.  rokken
## 25        Jourestraat 26-arnhem-the netherlands  mevr l.  rokken
```

```
f2<-data.frame(company_code=c("1000","1100","1110","1111"),company=c("Philips","akzo"
,"Van Houten","unilver"))
print(f2)
```

```
##   company_code    company
## 1         1000    Philips
## 2         1100       akzo
## 3         1110 Van Houten
## 4         1111    unilver
```

```
left_join(refinesheet4,f2,by="company")
```

```
## Warning in left_join_impl(x, y, by$x, by$y): joining factors with different
## levels, coercing to character vector
```

```
##      productcat Productcode    company Number
## 1   Smartphone          p     Philips      5
## 2   Smartphone          p     Philips     43
## 3   Smartphone          p     Philips     23
## 4   Smartphone          p        akzo     34
## 5   Smartphone          p     Philips     56
## 6   Smartphone          p Van Houten     23
## 7           TV          v        akzo     43
## 8           TV          v        akzo     12
## 9           TV          v     Philips     67
## 10          TV          v     Philips     21
## 11          TV          v Van Houten     56
## 12          TV          v Van Houten     65
## 13      Laptop          x     Philips      3
## 14      Laptop          x     Philips     34
## 15      Laptop          x     Philips     12
## 16      Laptop          x        akzo      5
## 17      Laptop          x        akzo      8
## 18      Laptop          x Van Houten     45
## 19      Laptop          x Van Houten     21
## 20      Laptop          x     unilver      3
## 21      Tablet          q        akzo      5
## 22      Tablet          q        akzo      9
## 23      Tablet          q    unilever      4
## 24      Tablet          q    unilever      6
## 25      Tablet          q    unilever      8
##                                        full_address               name
## 1   Groningensingel 147-arnhem-the netherlands     dhr p.   jansen
## 2   Groningensingel 148-arnhem-the netherlands     dhr p.   hansen
## 3   Groningensingel 152-arnhem-the netherlands   dhr p. franssen
## 4     Leeuwardenweg 181-arnhem-the netherlands     dhr p. janssen
## 5     Delfzijlstraat 54-arnhem-the netherlands   mevr l.   mokken
## 6     Delfzijlstraat 61-arnhem-the netherlands   mevr l.   dokken
## 7     Leeuwardenweg 178-arnhem-the netherlands     dhr p.   bansen
## 8     Leeuwardenweg 179-arnhem-the netherlands     dhr p.   vansen
## 9     Delfzijlstraat 55-arnhem-the netherlands   mevr l.   mokken
## 10    Delfzijlstraat 56-arnhem-the netherlands   mevr l.   mokken
## 11    Delfzijlstraat 58-arnhem-the netherlands   mevr l.   wokken
## 12    Delfzijlstraat 59-arnhem-the netherlands   mevr l.   kokken
## 13  Groningensingel 149-arnhem-the netherlands     dhr j. Gansen
## 14  Groningensingel 150-arnhem-the netherlands     dhr p.   mansen
## 15  Groningensingel 151-arnhem-the netherlands     dhr p. fransen
## 16    Leeuwardenweg 180-arnhem-the netherlands     dhr p. bransen
## 17    Leeuwardenweg 184-arnhem-the netherlands   mevr l.   mokken
## 18    Delfzijlstraat 57-arnhem-the netherlands   mevr l.   sokken
## 19    Delfzijlstraat 60-arnhem-the netherlands   mevr l.   Bokken
## 20       Jourestraat 23-arnhem-the netherlands   mevr l.   gokken
## 21    Leeuwardenweg 182-arnhem-the netherlands   mevr l.   rokken
## 22    Leeuwardenweg 183-arnhem-the netherlands   mevr l.   lokken
## 23       Jourestraat 24-arnhem-the netherlands mevr l.   stokken
```

```
## 24      Jourestraat 25-arnhem-the netherlands  mevr l.  rokken
## 25      Jourestraat 26-arnhem-the netherlands  mevr l.  rokken
##    company_code
## 1          1000
## 2          1000
## 3          1000
## 4          1100
## 5          1000
## 6          1110
## 7          1100
## 8          1100
## 9          1000
## 10         1000
## 11         1110
## 12         1110
## 13         1000
## 14         1000
## 15         1000
## 16         1100
## 17         1100
## 18         1110
## 19         1110
## 20         1111
## 21         1100
## 22         1100
## 23         <NA>
## 24         <NA>
## 25         <NA>
```

```
refinesheet5<-left_join(refinesheet4,f2,by="company")
```

```
## Warning in left_join_impl(x, y, by$x, by$y): joining factors with different
## levels, coercing to character vector
```

```
print(refinesheet5)
```

```
##      productcat Productcode    company Number
## 1   Smartphone           p    Philips      5
## 2   Smartphone           p    Philips     43
## 3   Smartphone           p    Philips     23
## 4   Smartphone           p       akzo     34
## 5   Smartphone           p    Philips     56
## 6   Smartphone           p Van Houten     23
## 7           TV           v       akzo     43
## 8           TV           v       akzo     12
## 9           TV           v    Philips     67
## 10          TV           v    Philips     21
## 11          TV           v Van Houten     56
## 12          TV           v Van Houten     65
## 13      Laptop           x    Philips      3
## 14      Laptop           x    Philips     34
## 15      Laptop           x    Philips     12
## 16      Laptop           x       akzo      5
## 17      Laptop           x       akzo      8
## 18      Laptop           x Van Houten     45
## 19      Laptop           x Van Houten     21
## 20      Laptop           x    unilver      3
## 21      Tablet           q       akzo      5
## 22      Tablet           q       akzo      9
## 23      Tablet           q   unilever      4
## 24      Tablet           q   unilever      6
## 25      Tablet           q   unilever      8
##                                  full_address             name
## 1  Groningensingel 147-arnhem-the netherlands    dhr p. jansen
## 2  Groningensingel 148-arnhem-the netherlands    dhr p. hansen
## 3  Groningensingel 152-arnhem-the netherlands  dhr p. franssen
## 4    Leeuwardenweg 181-arnhem-the netherlands   dhr p. janssen
## 5    Delfzijlstraat 54-arnhem-the netherlands  mevr l.  mokken
## 6    Delfzijlstraat 61-arnhem-the netherlands  mevr l.  dokken
## 7    Leeuwardenweg 178-arnhem-the netherlands    dhr p. bansen
## 8    Leeuwardenweg 179-arnhem-the netherlands    dhr p. vansen
## 9    Delfzijlstraat 55-arnhem-the netherlands  mevr l.  mokken
## 10   Delfzijlstraat 56-arnhem-the netherlands  mevr l.  mokken
## 11   Delfzijlstraat 58-arnhem-the netherlands  mevr l.  wokken
## 12   Delfzijlstraat 59-arnhem-the netherlands  mevr l.  kokken
## 13 Groningensingel 149-arnhem-the netherlands   dhr j. Gansen
## 14 Groningensingel 150-arnhem-the netherlands    dhr p. mansen
## 15 Groningensingel 151-arnhem-the netherlands    dhr p. fransen
## 16   Leeuwardenweg 180-arnhem-the netherlands   dhr p. bransen
## 17   Leeuwardenweg 184-arnhem-the netherlands  mevr l.  mokken
## 18   Delfzijlstraat 57-arnhem-the netherlands  mevr l.  sokken
## 19   Delfzijlstraat 60-arnhem-the netherlands  mevr l.  Bokken
## 20       Jourestraat 23-arnhem-the netherlands  mevr l.  gokken
## 21   Leeuwardenweg 182-arnhem-the netherlands  mevr l.  rokken
## 22   Leeuwardenweg 183-arnhem-the netherlands  mevr l.  lokken
## 23       Jourestraat 24-arnhem-the netherlands mevr l.  stokken
```

```
## 24      Jourestraat 25-arnhem-the netherlands   mevr l.   rokken
## 25      Jourestraat 26-arnhem-the netherlands   mevr l.   rokken
##    company_code
## 1         1000
## 2         1000
## 3         1000
## 4         1100
## 5         1000
## 6         1110
## 7         1100
## 8         1100
## 9         1000
## 10        1000
## 11        1110
## 12        1110
## 13        1000
## 14        1000
## 15        1000
## 16        1100
## 17        1100
## 18        1110
## 19        1110
## 20        1111
## 21        1100
## 22        1100
## 23        <NA>
## 24        <NA>
## 25        <NA>
```

```
f3<- data.frame(Prodcatcode=c("1001","1101","0000","0001"),Productcode=c("p","v","x",
"q"))
print(f3)
```

```
##   Prodcatcode Productcode
## 1      1001         p
## 2      1101         v
## 3      0000         x
## 4      0001         q
```

```
refinesheet6<-left_join(refinesheet5,f3,by="Productcode")
```

```
## Warning in left_join_impl(x, y, by$x, by$y): joining factor and character
## vector, coercing into character vector
```

```
print(refinesheet6)
```

```
##    productcat Productcode    company Number
## 1  Smartphone           p    Philips      5
## 2  Smartphone           p    Philips     43
## 3  Smartphone           p    Philips     23
## 4  Smartphone           p       akzo     34
## 5  Smartphone           p    Philips     56
## 6  Smartphone           p Van Houten     23
## 7          TV           v       akzo     43
## 8          TV           v       akzo     12
## 9          TV           v    Philips     67
## 10         TV           v    Philips     21
## 11         TV           v Van Houten     56
## 12         TV           v Van Houten     65
## 13     Laptop           x    Philips      3
## 14     Laptop           x    Philips     34
## 15     Laptop           x    Philips     12
## 16     Laptop           x       akzo      5
## 17     Laptop           x       akzo      8
## 18     Laptop           x Van Houten     45
## 19     Laptop           x Van Houten     21
## 20     Laptop           x    unilver      3
## 21     Tablet           q       akzo      5
## 22     Tablet           q       akzo      9
## 23     Tablet           q   unilever      4
## 24     Tablet           q   unilever      6
## 25     Tablet           q   unilever      8
##                                 full_address              name
## 1  Groningensingel 147-arnhem-the netherlands    dhr p. jansen
## 2  Groningensingel 148-arnhem-the netherlands    dhr p. hansen
## 3  Groningensingel 152-arnhem-the netherlands  dhr p. franssen
## 4    Leeuwardenweg 181-arnhem-the netherlands   dhr p. janssen
## 5    Delfzijlstraat 54-arnhem-the netherlands  mevr l.  mokken
## 6    Delfzijlstraat 61-arnhem-the netherlands  mevr l.  dokken
## 7    Leeuwardenweg 178-arnhem-the netherlands    dhr p. bansen
## 8    Leeuwardenweg 179-arnhem-the netherlands    dhr p. vansen
## 9    Delfzijlstraat 55-arnhem-the netherlands  mevr l.  mokken
## 10   Delfzijlstraat 56-arnhem-the netherlands  mevr l.  mokken
## 11   Delfzijlstraat 58-arnhem-the netherlands  mevr l.  wokken
## 12   Delfzijlstraat 59-arnhem-the netherlands  mevr l.  kokken
## 13 Groningensingel 149-arnhem-the netherlands    dhr j. Gansen
## 14 Groningensingel 150-arnhem-the netherlands    dhr p. mansen
## 15 Groningensingel 151-arnhem-the netherlands    dhr p. fransen
## 16   Leeuwardenweg 180-arnhem-the netherlands   dhr p. bransen
## 17   Leeuwardenweg 184-arnhem-the netherlands  mevr l.  mokken
## 18   Delfzijlstraat 57-arnhem-the netherlands  mevr l.  sokken
## 19   Delfzijlstraat 60-arnhem-the netherlands  mevr l.  Bokken
## 20      Jourestraat 23-arnhem-the netherlands  mevr l.  gokken
## 21   Leeuwardenweg 182-arnhem-the netherlands  mevr l.  rokken
## 22   Leeuwardenweg 183-arnhem-the netherlands  mevr l.  lokken
## 23      Jourestraat 24-arnhem-the netherlands mevr l.  stokken
```

```
## 24        Jourestraat 25-arnhem-the netherlands  mevr l.  rokken
## 25        Jourestraat 26-arnhem-the netherlands  mevr l.  rokken
##    company_code Prodcatcode
## 1          1000        1001
## 2          1000        1001
## 3          1000        1001
## 4          1100        1001
## 5          1000        1001
## 6          1110        1001
## 7          1100        1101
## 8          1100        1101
## 9          1000        1101
## 10         1000        1101
## 11         1110        1101
## 12         1110        1101
## 13         1000        0000
## 14         1000        0000
## 15         1000        0000
## 16         1100        0000
## 17         1100        0000
## 18         1110        0000
## 19         1110        0000
## 20         1111        0000
## 21         1100        0001
## 22         1100        0001
## 23         <NA>        0001
## 24         <NA>        0001
## 25         <NA>        0001
```