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 Produ	ıctcode		addı		_
##	1	Philips	р	5	Groningensingel	147	arnhem
##	2	Philips	р	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	р	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	р	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	р	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	р	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		na	ame		
##	1	the netherlands	dhr	p. jans	sen		
##	2	the netherlands	dhr	p. hans	sen		
##	3	the netherlands	dhr	j. Gans	sen		
##	4	the netherlands	dhr	p. mans	sen		
##	5	the netherlands	dhr 1	p. frans	sen		
##	6	the netherlands	dhr p	. franss	sen		
##	7	the netherlands	dhr	p. bans	sen		
##	8	the netherlands	dhr	p. vans	sen		
##		the netherlands	dhr 1	o. brans	sen		
##	10	the netherlands	dhr 1	o. janss			
##	11	the netherlands	mevr :				
##		the netherlands	mevr 1				
##		the netherlands	mevr :				
##		the netherlands	mevr :				
##		the netherlands	mevr :				
##		the netherlands	mevr :				
##		the netherlands	mevr :				
##		the netherlands	mevr :				
##		the netherlands	mevr :				
##		the netherlands	mevr :				
##		the netherlands	mevr :	l. dokł	ken		
##	22	the netherlands	mevr :	l. gok}	ken		
##	2.3	the netherlands	mevr l	. stok	ren		

\$ name

```
## 24 the netherlands mevr 1. rokken
## 25 the netherlands mevr 1. 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 1 ...
## $ country : Factor w/ 1 level "the netherlands": 1 1 1 1 1 1 1 1 1 1 ...
```

```
print(refinesheet2)
```

: Factor w/ 20 levels "dhr j. Gansen",..: 7 6 1 9 4 5 2 10 3 8 ...

##		company Produ	ıctcode	Number	addı	cess	city
##	1	Philips	р	5	Groningensingel	147	arnhem
##	2	Philips	р	43	Groningensingel	148	arnhem
##	3	Philips	X	3	Groningensingel	149	arnhem
##	4	Philips	Х	34	Groningensingel	150	arnhem
##	5	Philips	Х	12	Groningensingel	151	arnhem
##	6	Philips	р	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	р	34	Leeuwardenweg	181	arnhem
##	11	akzo	q	5	Leeuwardenweg	182	arnhem
##	12	akzo	q	9	Leeuwardenweg	183	arnhem
##	13	akzo	Х	8	Leeuwardenweg	184	arnhem
##	14	Philips	р	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	Х	21	Delfzijlstraat	60	arnhem
##	21	Van Houten	р	23	Delfzijlstraat	61	arnhem
##	22	unilver	Х	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		na	ame		
##	1	the netherlands	dhr	p. jans	sen		
##	2	the netherlands	dhr	p. hans	sen		
##	3	the netherlands	dhr	j. Gans	sen		
##	4	the netherlands $% \frac{1}{2}\left(\frac{1}{2}\right) =\frac{1}{2}\left(\frac{1}{2}\right) +\frac{1}{2}\left($	dhr	p. mans	sen		
##	5	the netherlands $% \frac{1}{2}\left(\frac{1}{2}\right) =\frac{1}{2}\left(\frac{1}{2}\right) +\frac{1}{2}\left($	dhr p	o. frans	sen		
##	6	the netherlands	dhr p.	. franss	sen		
##	7	the netherlands $% \frac{1}{2}\left(\frac{1}{2}\right) =\frac{1}{2}\left(\frac{1}{2}\right) +\frac{1}{2}\left($	dhr	p. bans	sen		
##	8	the netherlands $% \frac{1}{2}\left(\frac{1}{2}\right) =\frac{1}{2}\left(\frac{1}{2}\right) +\frac{1}{2}\left($	dhr	p. vans	sen		
##	9	the netherlands	dhr p	o. brans	sen		
##	10	the netherlands	dhr p	o. janss	sen		
##	11	the netherlands	mevr]	L. rok	ken		
##	12	the netherlands	mevr]	L. lok	ken		
##	13	the netherlands	mevr]	L. mokł	ken		
##	14	the netherlands $% \frac{1}{2}\left(\frac{1}{2}\right) =\frac{1}{2}\left(\frac{1}{2}\right) +\frac{1}{2}\left($	mevr]	L. mokł	cen		
##	15	the netherlands	mevr]	L. mokł	ken		
##		the netherlands	mevr]	L. mokk	ken		
##	17	the netherlands	mevr]	. sok	cen		
##	18	the netherlands	mevr]	. wokł	cen		
##	19	the netherlands	mevr]	. kokł	cen		
##	20	the netherlands	mevr]	. Bokk	cen		
##	21	the netherlands	mevr]	. dokł	cen		
##	22	the netherlands	mevr]	L. gokł	cen		
##	23	the netherlands	mevr 1.	. stok	cen		

##		productcat Pro	ductcode	company	Number	address	city
##	1	Smartphone	р	Philips	5	Groningensingel 147	arnhem
##	2	Smartphone	р	Philips	43	Groningensingel 148	arnhem
##	3	Smartphone	р	Philips	23	Groningensingel 152	arnhem
##	4	Smartphone	р	akzo	34	Leeuwardenweg 181	arnhem
##	5	Smartphone	р	Philips	56	Delfzijlstraat 54	arnhem
##	6	Smartphone	р	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
##		countr	У	name			
##	1	the netherland	s dhr	p. jansen			
##	2	the netherland	s dhr	p. hansen			
##	3	the netherland	s dhr p	. franssen			
##	4	the netherland	s dhr	p. janssen			
##	5	the netherland	s mevr	l. mokken			
##	6	the netherland	s mevr	l. dokken			
##	7	the netherland	s dhr	p. bansen			
##	8	the netherland	s dhr	p. vansen			
##	9	the netherland	s mevr	l. mokken			
##	10	the netherland	s mevr	l. mokken			
##	11	the netherland	s mevr	l. wokken			
##	12	the netherland	s mevr	l. kokken			
##	13	the netherland	s dhr	j. Gansen			
##	14	the netherland	s dhr	p. mansen			
##	15	the netherland	s dhr	p. fransen			
##	16	the netherland	s dhr	p. bransen			
##	17	the netherland	s mevr	l. mokken			
##		the netherland		l. sokken			
##		the netherland		l. Bokken			
##		the netherland		3			
##		the netherland		l. rokken			
##	22	the netherland	s mevr	l. lokken			
##	23	the netherland	s mevr l	. stokken			

```
## 24 the netherlands mevr 1. rokken
## 25 the netherlands mevr 1. 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</pre>
print(refinesheet3)
```

##		productcat Pro	ductcode	company	Number	address	city
##	1	Smartphone	р	Philips	5	Groningensingel 147	arnhem
##	2	Smartphone	р	Philips	43	Groningensingel 148	arnhem
##	3	Smartphone	р	Philips	23	Groningensingel 152	arnhem
##	4	Smartphone	р	akzo	34	Leeuwardenweg 181	arnhem
##	5	Smartphone	р	Philips	56	Delfzijlstraat 54	arnhem
##	6	Smartphone	р	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	Х	Philips	12	Groningensingel 151	arnhem
##	16	Laptop	Х	akzo	5	Leeuwardenweg 180	arnhem
##	17	Laptop	Х	akzo	8	Leeuwardenweg 184	arnhem
##	18	Laptop	Х	Van Houten	45	Delfzijlstraat 57	arnhem
##	19	Laptop	Х	Van Houten	21	Delfzijlstraat 60	arnhem
##	20	Laptop	Х	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
##		countr	.У	name			
##	1	the netherland	ls dhr	p. jansen			
##	2	the netherland	ls dhr	p. hansen			
##	3	the netherland	ls dhr p	. franssen			
##	4	the netherland	ls dhr j	o. janssen			
##	5	the netherland	ls mevr	l. mokken			
##	6	the netherland	ls mevr	l. dokken			
##	7	the netherland	ls dhr	p. bansen			
##	8	the netherland	ls dhr	p. vansen			
##	9	the netherland	ls mevr	l. mokken			
##	10	the netherland	ls mevr	l. mokken			
##	11	the netherland	ls mevr	l. wokken			
##	12	the netherland	ls mevr	l. kokken			
##	13	the netherland	ls dhr	j. Gansen			
##	14	the netherland	ls dhr	p. mansen			
##	15	the netherland	ls dhr j	o. fransen			
##	16	the netherland	ls dhr 1	o. bransen			
##	17	the netherland	ls mevr	l. mokken			
##	18	the netherland	ls mevr	l. sokken			
##	19	the netherland	ls mevr	l. Bokken			
##	20	the netherland	ls mevr	l. gokken			
##	21	the netherland	ls mevr	l. rokken			
##	22	the netherland					
##	23	the netherland	ls mewr 1	. stokken			

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

```
## 24    Jourestraat 25-arnhem-the netherlands mevr 1. rokken
## 25    Jourestraat 26-arnhem-the netherlands mevr 1. rokken
```

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

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

```
## 24
          Jourestraat 25-arnhem-the netherlands mevr 1. rokken
## 25
          Jourestraat 26-arnhem-the netherlands mevr 1. 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
           1100
## 2
                       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
                                Philips
                                              5
## 2
     Smartphone
                                             43
                                Philips
                           р
  3
     Smartphone
                                Philips
                                             23
##
                           р
     Smartphone
                                             34
##
  4
                                   akzo
                           р
  5
     Smartphone
                                             56
##
                                Philips
                           р
##
   6
      Smartphone
                           p Van Houten
                                             23
                                             43
##
                                   akzo
##
  8
              TV
                                             12
                                   akzo
                           V
##
  9
              TV
                                Philips
                                             67
## 10
              TV
                                Philips
                                             21
## 11
              TV
                           v Van Houten
                                             56
##
  12
              TV
                           v Van Houten
                                             65
## 13
          Laptop
                                Philips
                                              3
## 14
          Laptop
                           Х
                                Philips
                                             34
## 15
          Laptop
                                Philips
                                             12
                           Х
## 16
          Laptop
                                   akzo
                                              5
                           Х
## 17
                                              8
          Laptop
                                   akzo
## 18
          Laptop
                           x Van Houten
                                             45
## 19
          Laptop
                           x Van Houten
                                             21
## 20
          Laptop
                                unilver
                                              3
                                              5
## 21
          Tablet
                                   akzo
                           q
  22
                                              9
##
          Tablet
                                   akzo
                           q
## 23
          Tablet
                              unilever
                                              4
                           q
## 24
                              unilever
                                              6
          Tablet
                           q
  25
          Tablet
                               unilever
##
                           a
##
                                     full_address
                                                              name
     Groningensingel 147-arnhem-the netherlands
##
  1
                                                    dhr p. jansen
  2
      Groningensingel 148-arnhem-the netherlands
                                                     dhr p. hansen
     Groningensingel 152-arnhem-the netherlands dhr p. franssen
##
  3
##
  4
        Leeuwardenweg 181-arnhem-the netherlands dhr p. janssen
       Delfzijlstraat 54-arnhem-the netherlands mevr 1. mokken
  5
##
       Delfzijlstraat 61-arnhem-the netherlands mevr 1.
                                                            dokken
##
   6
  7
       Leeuwardenweg 178-arnhem-the netherlands
                                                    dhr p. bansen
##
##
  8
       Leeuwardenweg 179-arnhem-the netherlands
                                                     dhr p. vansen
        Delfzijlstraat 55-arnhem-the netherlands mevr 1. mokken
##
   9
## 10
       Delfzijlstraat 56-arnhem-the netherlands mevr 1. mokken
## 11
        Delfzijlstraat 58-arnhem-the netherlands mevr 1.
                                                            wokken
        Delfzijlstraat 59-arnhem-the netherlands mevr 1.
## 12
                                                            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 1. mokken
##
  18
       Delfzijlstraat 57-arnhem-the netherlands mevr 1. sokken
  19
       Delfzijlstraat 60-arnhem-the netherlands mevr 1. Bokken
##
##
  20
           Jourestraat 23-arnhem-the netherlands mevr 1.
                                                            gokken
  21
        Leeuwardenweg 182-arnhem-the netherlands mevr 1. rokken
##
##
  22
        Leeuwardenweg 183-arnhem-the netherlands mevr 1. lokken
## 23
           Jourestraat 24-arnhem-the netherlands mevr 1. stokken
```

```
## 24
           Jourestraat 25-arnhem-the netherlands mevr 1. rokken
## 25
           Jourestraat 26-arnhem-the netherlands mevr 1. 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)</pre>
```

##		productcat Productcode	COmpani	Number	
##	1	Smartphone p	Philips		
##		Smartphone p	Philips		
##		Smartphone p	Philips		
##		Smartphone p	akzo		
##			Philips		
##		=	Van Houter		
		-			
##		TV v	akzo		
##		TV v	akzo		
##		TV v	Philips		
	10	TV v	Philips		
##	11		Van Houter		
##	12		Van Houten		
##	13	Laptop x	Philips		
	14	Laptop x	Philips		
	15	Laptop x	Philips		
##	16	Laptop x	akzo		
##	17	Laptop x	akzo		
##	18	1 1	Van Houter		
##	19	1 1	Van Houten		
##	20	Laptop x	unilver		
##	21	Tablet q	akzo		
##	22	Tablet q	akzo		
##	23	Tablet q			
	24	Tablet q	unilever		
	25	Tablet q	unilever		
##				l_address	name
##		Groningensingel 147-arr			= =
##		Groningensingel 148-arm			=
##	3	Groningensingel 152-arm			-
##		Leeuwardenweg 181-arı			
##	5	Delfzijlstraat 54-arı			mevr l. mokken
##		Delfzijlstraat 61-arı			mevr l. dokken
##	7	Leeuwardenweg 178-arı	nhem-the ne	therlands	dhr p. bansen
##	8	Leeuwardenweg 179-arı	nhem-the ne	therlands	dhr p. vansen
##	9	Delfzijlstraat 55-arı	nhem-the ne	therlands	mevr l. mokken
##	10	Delfzijlstraat 56-arı	nhem-the ne	therlands	mevr l. mokken
##	11	Delfzijlstraat 58-arm	nhem-the ne	therlands	mevr l. wokken
##	12	Delfzijlstraat 59-arı	nhem-the ne	therlands	mevr l. kokken
##	13	Groningensingel 149-arm	nhem-the ne	therlands	dhr j. Gansen
##	14	Groningensingel 150-arm	nhem-the ne	therlands	dhr p. mansen
##	15	Groningensingel 151-arm	nhem-the ne	therlands	dhr p. fransen
##	16	Leeuwardenweg 180-arı	nhem-the ne	therlands	dhr p. bransen
##	17	Leeuwardenweg 184-arı	nhem-the ne	therlands	mevr l. mokken
##	18	Delfzijlstraat 57-arm	nhem-the ne	therlands	mevr l. sokken
##	19	Delfzijlstraat 60-arı	nhem-the ne	therlands	mevr l. Bokken
	20	Jourestraat 23-arı	nhem-the ne	therlands	mevr l. gokken
##	21	Leeuwardenweg 182-arı	nhem-the ne	therlands	mevr l. rokken
##	22	Leeuwardenweg 183-arı			mevr l. lokken
	23	Jourestraat 24-arı			

```
Jourestraat 25-arnhem-the netherlands mevr 1. rokken
## 24
## 25
           Jourestraat 26-arnhem-the netherlands mevr 1. 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
              1000
## 13
## 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",
```

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

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

##	24	Jourestraat	25-arnhem-the	netherlands	mevr	1.	rokken	
##	25	Jourestraat	26-arnhem-the	netherlands	mevr	1.	rokken	
##		company_code Prod	dcatcode					
##	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></na>	0001					
##	24	<na></na>	0001					
##	25	<na></na>	0001					