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
```

```
refinesheet5<-refinesheet4%>% mutate(company_philips=ifelse(refinesheet4$company=="Ph
ilips",1,0))
refinesheet6<-refinesheet5%>% mutate(company_akzo=ifelse(refinesheet5$company=="akzo"
,1,0))
refinesheet7<-refinesheet6%>% mutate(company_vanHouten=ifelse(refinesheet6$company=="
Van Houten",1,0))
refinesheet8<-refinesheet7%>% mutate(company_unilever=ifelse(refinesheet7$company=="u
nilever",1,0))
print(refinesheet8)
```

```
##     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_philips company_akzo company_vanHouten company_unilever
## 1                 1            0                 0                0
## 2                 1            0                 0                0
## 3                 1            0                 0                0
## 4                 0            1                 0                0
## 5                 1            0                 0                0
## 6                 0            0                 1                0
## 7                 0            1                 0                0
## 8                 0            1                 0                0
## 9                 1            0                 0                0
## 10                1            0                 0                0
## 11                0            0                 1                0
## 12                0            0                 1                0
## 13                1            0                 0                0
## 14                1            0                 0                0
## 15                1            0                 0                0
## 16                0            1                 0                0
## 17                0            1                 0                0
## 18                0            0                 1                0
## 19                0            0                 1                0
## 20                0            0                 0                0
## 21                0            1                 0                0
## 22                0            1                 0                0
## 23                0            0                 0                1
## 24                0            0                 0                1
## 25                0            0                 0                1
```

```
refinesheet9<-refinesheet8%>% mutate(Product_smartphone=ifelse(refinesheet8$productca
t=="Smartphone",1,0))
refinesheet10<-refinesheet9 %>% mutate(Product_TV=ifelse(refinesheet8$productcat=="TV
",1,0))
refinesheet11<-refinesheet10 %>% mutate(Product_Laptop=ifelse(refinesheet10$productca
t=="Laptop",1,0))
refine_clean2<-refinesheet11 %>% mutate(Product_tablet=ifelse(refinesheet11$productca
t=="Tablet",1,0))
setwd("~/Research/test1/refineassignment")
write.csv(refine_clean2,file='refine_clean2.csv')
print(refine_clean2)
```

```
##    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_philips company_akzo company_vanHouten company_unilever
## 1                1            0                 0                0
## 2                1            0                 0                0
## 3                1            0                 0                0
## 4                0            1                 0                0
## 5                1            0                 0                0
## 6                0            0                 1                0
## 7                0            1                 0                0
## 8                0            1                 0                0
## 9                1            0                 0                0
## 10               1            0                 0                0
## 11               0            0                 1                0
## 12               0            0                 1                0
## 13               1            0                 0                0
## 14               1            0                 0                0
## 15               1            0                 0                0
## 16               0            1                 0                0
## 17               0            1                 0                0
## 18               0            0                 1                0
## 19               0            0                 1                0
## 20               0            0                 0                0
## 21               0            1                 0                0
## 22               0            1                 0                0
## 23               0            0                 0                1
## 24               0            0                 0                1
## 25               0            0                 0                1
##    Product_smartphone Product_TV Product_Laptop Product_tablet
## 1                   1          0              0              0
## 2                   1          0              0              0
## 3                   1          0              0              0
## 4                   1          0              0              0
## 5                   1          0              0              0
## 6                   1          0              0              0
## 7                   0          1              0              0
## 8                   0          1              0              0
## 9                   0          1              0              0
## 10                  0          1              0              0
## 11                  0          1              0              0
## 12                  0          1              0              0
## 13                  0          0              1              0
## 14                  0          0              1              0
## 15                  0          0              1              0
## 16                  0          0              1              0
## 17                  0          0              1              0
## 18                  0          0              1              0
## 19                  0          0              1              0
## 20                  0          0              1              0
## 21                  0          0              0              1
## 22                  0          0              0              1
```

```
## 23                    0           0           0           1
## 24                    0           0           0           1
## 25                    0           0           0           1
```