mappeoppgave 4

```
knitr::opts_chunk$set(echo = TRUE)
library(rvest)
library(tidyverse)
## -- Attaching packages -----
                                                    ----- tidyverse 1.3.1 --
## v ggplot2 3.3.5
                     v purrr
                               0.3.4
## v tibble 3.1.6 v dplyr 1.0.9
## v tidyr 1.2.0 v stringr 1.4.0
                   v forcats 0.5.1
## v readr
           2.1.2
## Warning: package 'readr' was built under R version 4.1.2
## Warning: package 'dplyr' was built under R version 4.1.2
## -- Conflicts ----- tidyverse conflicts() --
## x dplyr::filter()
                           masks stats::filter()
## x readr::guess_encoding() masks rvest::guess_encoding()
## x dplyr::lag()
                           masks stats::lag()
library(rlist)
library(purrr)
url1 <-"https://timeplan.uit.no/emne_timeplan.php?sem=22v&module%5B%5D=SOK-1005-1&week=1-20&View=list"
url2 <- "https://timeplan.uit.no/emne_timeplan.php?sem=22v&module%5B%5D=SOK-1006-1&week=1-20&View=list"
url3 <- "https://timeplan.uit.no/emne_timeplan.php?sem=22v&module%5B%5D=SOK-1016-1&week=1-20&View=list"
url_list <- list (url1, url2, url3)</pre>
scrape <- function(url_list) {</pre>
 page <- read_html(url_list)</pre>
 table <- html_nodes(page, 'table')</pre>
  table <- html_table(table, fill=TRUE)</pre>
  table[[1]]
  timeplan <- list.stack(table)</pre>
  timeplan
  colnames(timeplan) <- timeplan[1,]</pre>
  timeplan
  timeplan <- timeplan %>% filter(!Dato=="Dato")
  str(timeplan)
  timeplan <- timeplan %>% separate(Dato,
                             into = c("Dag", "Dato"),
                             sep = "(? <= [A-Za-z])(? = [0-9])")
```

```
timeplan$Dato <- as.Date(timeplan$Dato, format="%d.%m.%Y")</pre>
 timeplan$Uke <- strftime(timeplan$Dato, format = "%V")</pre>
 timeplan <- timeplan %>% select(Uke, Dato, Dag, Tid, Rom, Emnekode)
 timeplan
 str(timeplan)
 return(timeplan)
map(url_list, scrape)
## Column 1 ['Uke 3'] of item 2 is missing in item 1. Use fill=TRUE to fill with NA (NULL for list colu
                   20 obs. of 6 variables:
## 'data.frame':
## $ Dato
              : chr "Torsdag13.01.2022" "Torsdag20.01.2022" "Torsdag27.01.2022" "Torsdag03.02.2022"
                : chr "14:15-16:00" "14:15-16:00" "14:15-16:00" "14:15-16:00" ...
## $ Tid
                : chr "VIRTUELT _Digital undervisning" "VIRTUELT _Digital undervisning" "VIRTUELT _Di
## $ Rom
## $ Emnekode
                : chr "SOK-1005-1" "SOK-1005-1" "SOK-1005-1" "SOK-1005-1" ...
## $ Beskrivelse: chr "Forelesning" "Forelesning" "Forelesning" "Forelesning Opptak+live" ...
## $ Lærer
                : chr "Ø. Myrland" "Ø. Myrland" "Ø. Myrland" "Ø. Myrland" ...
## 'data.frame':
                   20 obs. of 6 variables:
            : chr "02" "03" "04" "05" ...
## $ Uke
             : Date, format: "2022-01-13" "2022-01-20" ...
             : chr "Torsdag" "Torsdag" "Torsdag" ...
## $ Dag
## $ Tid
             : chr "14:15-16:00" "14:15-16:00" "14:15-16:00" "14:15-16:00" ...
             : chr "VIRTUELT _Digital undervisning" "VIRTUELT _Digital undervisning" "VIRTUELT _Digit
## $ Rom
## $ Emnekode: chr "SOK-1005-1" "SOK-1005-1" "SOK-1005-1" "SOK-1005-1" ...
## Column 1 ['Uke 4'] of item 2 is missing in item 1. Use fill=TRUE to fill with NA (NULL for list colu
                   52 obs. of 6 variables:
## 'data.frame':
                : chr "Tirsdag18.01.2022" "Onsdag19.01.2022" "Torsdag20.01.2022" "Tirsdag25.01.2022"
## $ Dato
                : chr "12:15-13:00" "12:15-16:00" "09:15-14:00" "14:15-17:00" ...
## $ Tid
## $ Rom
                : chr "HHT 01.202AUD" "VIRTUELT _Digital undervisning" "VIRTUELT _Digital undervisning"
## $ Emnekode : chr "SOK-1006-1" "SOK-1006-1" "SOK-1006-1" "SOK-1006-1" ...
## $ Beskrivelse: chr "Forelesninger TromsøOppstartsmøte (digital undervisning) Opptak+live" "Forele
                : chr "D.J. Clark" "J. Thøgersen" "J. Thøgersen" "V. Andreassen" ...
## $ Lærer
## Warning: Expected 2 pieces. Missing pieces filled with `NA` in 23 rows [7, 10,
## 12, 14, 16, 17, 19, 21, 23, 25, 26, 28, 30, 32, 35, 38, 39, 42, 44, 46, ...].
## 'data.frame':
                 52 obs. of 6 variables:
            : chr "03" "03" "03" "04" ...
## $ Uke
             : Date, format: "2022-01-18" "2022-01-19" ...
## $ Dag
             : chr "Tirsdag" "Onsdag" "Torsdag" "Tirsdag" ...
## $ Tid
             : chr "12:15-13:00" "12:15-16:00" "09:15-14:00" "14:15-17:00" ...
             : chr "HHT 01.202AUD" "VIRTUELT _Digital undervisning" "VIRTUELT _Digital undervisning"
## $ Rom
## $ Emnekode: chr "SOK-1006-1" "SOK-1006-1" "SOK-1006-1" "SOK-1006-1" ...
## Column 1 ['Uke 3'] of item 2 is missing in item 1. Use fill=TRUE to fill with NA (NULL for list colu
## 'data.frame':
                   25 obs. of 6 variables:
                : chr "Onsdag12.01.2022" "Tirsdag18.01.2022" "Torsdag27.01.2022" "Fredag11.02.2022" .
## $ Dato
                       "14:15-16:00" "10:15-12:00" "12:15-14:00" "12:15-14:00" ...
## $ Tid
                : chr
                : chr "VIRTUELT _Digital undervisning" "VIRTUELT _Digital undervisning" "VIRTUELT _Di
## $ Rom
```

\$ Emnekode : chr "SOK-1016-1" "SOK-1016-1" "SOK-1016-1" "SOK-1016-1" ...

```
## $ Beskrivelse: chr "Forelesninger Tromsø" "Forelesninger Tromsø" "Forelesninger Tromsø" "Forelesni
              : chr "E.C. Hvinden" "E.C. Hvinden" "E.C. Hvinden" "E.C. Hvinden" ...
## $ Lærer
## Warning: Expected 2 pieces. Missing pieces filled with `NA` in 1 rows [20].
## 'data.frame':
                   25 obs. of 6 variables:
   $ Uke
            : chr "02" "03" "04" "06" ...
             : Date, format: "2022-01-12" "2022-01-18" ...
             : chr "Onsdag" "Tirsdag" "Torsdag" "Fredag" ...
   $ Dag
   $ Tid
             : chr
                   "14:15-16:00" "10:15-12:00" "12:15-14:00" "12:15-14:00" ...
                   "VIRTUELT _Digital undervisning" "VIRTUELT _Digital undervisning" "VIRTUELT _Digit
             : chr
   $ Emnekode: chr "SOK-1016-1" "SOK-1016-1" "SOK-1016-1" "SOK-1016-1" ...
## [[1]]
##
      Uke
                                   Tid
               Dato
                        Dag
      02 2022-01-13 Torsdag 14:15-16:00 VIRTUELT _Digital undervising SOK-1005-1
      03 2022-01-20 Torsdag 14:15-16:00 VIRTUELT _Digital undervising SOK-1005-1 04 2022-01-27 Torsdag 14:15-16:00 VIRTUELT _Digital undervising SOK-1005-1
      05 2022-02-03 Torsdag 14:15-16:00
                                                       HHT 01.202AUD SOK-1005-1
      06 2022-02-10 Torsdag 14:15-16:00
                                                        HHT 01.202AUD SOK-1005-1
      07 2022-02-17 Torsdag 14:15-16:00
                                                       HHT 01.202AUD SOK-1005-1
## 6
                                                        HHT 01.202AUD SOK-1005-1
## 7
      08 2022-02-24 Torsdag 14:15-16:00
      09 2022-03-03 Torsdag 14:15-16:00
                                                        HHT 01.202AUD SOK-1005-1
## 8
      10 2022-03-10 Torsdag 14:15-16:00
                                                       HHT 01.202AUD SOK-1005-1
## 10 11 2022-03-17 Torsdag 14:15-16:00
                                                        HHT 01.202AUD SOK-1005-1
## 11 12 2022-03-24 Torsdag 14:15-16:00
                                                        HHT 01.202AUD SOK-1005-1
## 12 13 2022-03-31 Torsdag 14:15-16:00
                                                       HHT 01.202AUD SOK-1005-1
                                                       HHT 01.202AUD SOK-1005-1
## 13 14 2022-04-06 Onsdag 14:15-16:00
## 14 16 2022-04-20 Onsdag 13:15-15:00
                                                       HHT 01.202AUD SOK-1005-1
## 15 16 2022-04-21 Torsdag 14:15-16:00
                                                       HHT 01.202AUD SOK-1005-1
## 16 17 2022-04-27 Onsdag 13:15-15:00
                                                           HHT 02.217 SOK-1005-1
                                                           HHT 02.217 SOK-1005-1
## 17 18 2022-05-04 Onsdag 13:15-15:00
## 18 18 2022-05-05 Torsdag 14:15-16:00
                                                       HHT 01.202AUD SOK-1005-1
## 19 19 2022-05-11 Onsdag 13:15-15:00
                                                          HHT 02.217 SOK-1005-1
SOK-1005-
##
## [[2]]
##
      Uke
                                     Tid
                Dato
                         Dag
                                                                   R.om
                                                        HHT 01.202AUD
       03 2022-01-18 Tirsdag 12:15-13:00
       ## 2
       03 2022-01-20 Torsdag 09:15-14:00 VIRTUELT _Digital undervisning
## 3
       04 2022-01-25 Tirsdag 14:15-17:00
                                           HARSTAD HG5 AUD GRØNT
       MH U6.SAUD
                                                     TEO-H6 6.303-AUD3
## 6
       07 2022-02-17 Torsdag 08:15-10:00
## 7
     <NA>
                <NA>
                             12:15-14:00
                                                     TEO-H6 6.303-AUD3
       08 2022-02-24 Torsdag 11:15-14:00
                                                     TEO-H1 1.820-AUD1
## 9
       09 2022-02-28 Mandag 10:15-12:00
                                                            HHT 02.217
                <NA>
                             10:15-12:00
                                                            HHT 02.217
                                                            HHT 02.217
## 11
       09 2022-03-02
                     Onsdag 10:15-12:00
                                                            HHT 02.217
## 12 <NA>
                <NA>
                             10:15-12:00
                                                            HHT 02.217
## 13
       11 2022-03-14
                     Mandag 10:15-12:00
## 14 <NA>
                <NA>
                             10:15-12:00
                                                            HHT 02.217
       11 2022-03-16 Onsdag 10:15-12:00
                                                            HHT 02.217
## 16 <NA>
                                                            HHT 02.217
                <NA>
                          10:15-12:00
                                                    TEO-H6 6.303-AUD3
## 17 <NA>
                <NA>
                             12:15-16:00
```

```
## 39 <NA> <NA> 12:15-16:00 TEC

## 40 17 2022-04-28 Torsdag 09:15-14:00 TEC

## 41 18 2022-05-02 Mandag 10:15-12:00

## 42 <NA> <NA> 10:15-12:00

## 44 <NA> <NA> 10:15-12:00

## 45 19 2022-05-09 Mandag 10:15-12:00

## 46 <NA> <NA> 10:15-12:00

## 47 19 2022-05-11 Onsdag 10:15-12:00

## 48 <NA> <NA> 10:15-12:00

## 49 20 2022-05-16 Mandag 10:15-12:00

## 49 20 2022-05-16 Mandag 10:15-12:00

## 50 <NA> <NA> 10:15-12:00

## 50 <NA> <NA> 10:15-12:00

## 50 <NA> <NA> 10:15-12:00

## 51 20 2022-05-18 Onsdag 10:15-12:00

## 52 <NA> <NA> 10:15-12:00

## 51 20 2022-05-18 Onsdag 10:15-12:00

## 51 20 2022-05-18 Onsdag 10:15-12:00

## 52 <NA> <NA> 10:15-12:00

## 51 20 2022-05-18 Onsdag 10:15-12:00

## 51 20 2022-05-18 Onsdag 10:15-12:00

## 52 <NA> <NA> 10:15-12:00

## 51 20 2022-05-18 Onsdag 10:15-12:00
 ## 38 <NA>
                         <NA>
                                                10:15-12:00
                                                                                                             TEO-H1 1.836-AUD2
                                                                                                            TEO-H1 1.820-AUD1
                                                                                                                             HHT 02.217
                                                                                                                            HHT 02.217
                                                                                                                          HHT 02.217
                                                                                                                           HHT 02.217
                                                                                                                            HHT 02.217
                                                                                                                          HHT 02.217
                                                                                                                          HHT 02.217
                                                                                                                          HHT 02.217
                                                                                                                          HHT 02.217
                                                                                                                         HHT 02.217
                                                                                                                         HHT 02.217
                                                                                                                          HHT 02.217
 ## 1 SOK-1006-1
 ## 2 SOK-1006-1
 ## 3 SOK-1006-1
 ## 4 SOK-1006-1
 ## 5 SOK-1006-1
 ## 6 SOK-1006-1
 ## 7 SOK-1006-1
 ## 8 SOK-1006-1
 ## 9 SOK-1006-1
 ## 10 SOK-1006-1
 ## 11 SOK-1006-1
 ## 12 SOK-1006-1
 ## 13 SOK-1006-1
 ## 14 SOK-1006-1
 ## 15 SOK-1006-1
 ## 16 SOK-1006-1
 ## 17 SOK-1006-1
 ## 18 SOK-1006-1
```

```
## 19 SOK-1006-1
## 20 SDK-1006-1
## 21 SOK-1006-1
## 22 SOK-1006-1
## 23 SOK-1006-1
## 24 SOK-1006-1
## 25 SOK-1006-1
## 26 SOK-1006-1
## 27 SOK-1006-1
## 28 SOK-1006-1
## 29 SOK-1006-1
## 30 SOK-1006-1
## 31 SOK-1006-1
## 32 SOK-1006-1
## 33 SOK-1006-1
## 34 SOK-1006-1
## 35 SOK-1006-1
## 36 SOK-1006-1
## 37 SOK-1006-1
## 38 SOK-1006-1
## 39 SOK-1006-1
## 40 SOK-1006-1
## 41 SOK-1006-1
## 42 SOK-1006-1
## 43 SOK-1006-1
## 44 SOK-1006-1
## 45 SOK-1006-1
## 46 SOK-1006-1
## 47 SOK-1006-1
## 48 SOK-1006-1
## 49 SOK-1006-1
## 50 SOK-1006-1
## 51 SOK-1006-1
## 52 SOK-1006-1
##
## [[3]]
##
                 Dato
                          Dag
                                      Tid
                                                                      Rom
## 1
        02 2022-01-12 Onsdag 14:15-16:00 VIRTUELT _Digital undervisning
        03 2022-01-18 Tirsdag 10:15-12:00 VIRTUELT _Digital undervisning
        04 2022-01-27 Torsdag 12:15-14:00 VIRTUELT _Digital undervisning
## 3
        06 2022-02-11 Fredag 12:15-14:00
                                                       TEO-H1 1.836-AUD2
## 5
        07 2022-02-15 Tirsdag 12:15-14:00
                                                        TEO-H1 1.836-AUD2
        08 2022-02-25 Fredag 12:15-14:00
                                                        TEO-H1 1.836-AUD2
## 6
## 7
                                                        TEO-H1 1.836-AUD2
        09 2022-02-28 Mandag 12:15-14:00
## 8
        09 2022-03-01 Tirsdag 12:15-14:00
                                                               HHT 02.218
## 9
        09 2022-03-02 Onsdag 14:15-16:00
                                                               HHT 02.218
## 10
        11 2022-03-15 Tirsdag 10:15-12:00
                                                        TEO-H1 1.836-AUD2
## 11
        11 2022-03-17 Torsdag 12:15-14:00
                                                               HHT 02.218
## 12
        11 2022-03-18 Fredag 12:15-14:00
                                                               HHT 02.218
## 13
        12 2022-03-22 Tirsdag 10:15-12:00
                                                        TEO-H1 1.836-AUD2
## 14
        13 2022-03-31 Torsdag 12:15-14:00
                                                               HHT 02.217
## 15
        13 2022-04-01 Fredag 12:15-14:00
                                                               HHT 02.118
## 16
        14 2022-04-05 Tirsdag 12:15-14:00
                                                        TEO-H1 1.836-AUD2
## 17
        14 2022-04-07 Torsdag 10:15-12:00
                                                               HHT 02.118
```

```
14 2022-04-08 Fredag 12:15-14:00
                                                             HHT 02.119
## 19
       16 2022-04-21 Torsdag 10:15-12:00
                                                             HHT 02.118
## 20 <NA>
                <NA>
                             12:15-14:00
                                                             HHT 02.218
       17 2022-04-26 Tirsdag 10:15-12:00
                                                      TEO-H1 1.836-AUD2
## 21
## 22
       17 2022-04-28 Torsdag 12:15-14:00
                                                             HHT 02.218
       18 2022-05-05 Torsdag 12:15-14:00
                                                             HHT 02.218
## 23
       19 2022-05-12 Torsdag 12:15-14:00
                                                             HHT 02.218
## 24
## 25
       20 2022-05-19 Torsdag 12:15-14:00
                                                             HHT 02.218
##
       Emnekode
## 1 SOK-1016-1
## 2
     SOK-1016-1
     SOK-1016-1
## 3
## 4
     SOK-1016-1
## 5 SOK-1016-1
## 6 SOK-1016-1
## 7
     SOK-1016-1
## 8
     SOK-1016-1
## 9 SOK-1016-1
## 10 SOK-1016-1
## 11 SOK-1016-1
## 12 SOK-1016-1
## 13 SOK-1016-1
## 14 SOK-1016-1
## 15 SOK-1016-1
## 16 SOK-1016-1
## 17 SOK-1016-1
## 18 SOK-1016-1
## 19 SOK-1016-1
## 20 SOK-1016-1
## 21 SOK-1016-1
## 22 SOK-1016-1
## 23 SOK-1016-1
## 24 SOK-1016-1
## 25 SOK-1016-1
timeplan <- map(url_list, scrape)</pre>
## Column 1 ['Uke 3'] of item 2 is missing in item 1. Use fill=TRUE to fill with NA (NULL for list colu
## 'data.frame':
                   20 obs. of 6 variables:
                       "Torsdag13.01.2022" "Torsdag20.01.2022" "Torsdag27.01.2022" "Torsdag03.02.2022"
## $ Dato
                : chr
##
   $ Tid
                : chr
                       "14:15-16:00" "14:15-16:00" "14:15-16:00" "14:15-16:00" ...
                       "VIRTUELT _Digital undervisning" "VIRTUELT _Digital undervisning" "VIRTUELT _Di
## $ Rom
                : chr
                       "SOK-1005-1" "SOK-1005-1" "SOK-1005-1" "SOK-1005-1" ...
  $ Emnekode
                : chr
                       "Forelesning" "Forelesning" "Forelesning Opptak+live" ...
## $ Beskrivelse: chr
                : chr "Ø. Myrland" "Ø. Myrland" "Ø. Myrland" ...
   $ Lærer
## 'data.frame':
                   20 obs. of 6 variables:
             : chr "02" "03" "04" "05" ...
             : Date, format: "2022-01-13" "2022-01-20" ...
   $ Dato
   $ Dag
                    "Torsdag" "Torsdag" "Torsdag" ...
##
             : chr
                    "14:15-16:00" "14:15-16:00" "14:15-16:00" "14:15-16:00" ...
##
   $ Tid
              : chr
                    "VIRTUELT _Digital undervisning" "VIRTUELT _Digital undervisning" "VIRTUELT _Digit
                    "SOK-1005-1" "SOK-1005-1" "SOK-1005-1" "SOK-1005-1" ...
## Column 1 ['Uke 4'] of item 2 is missing in item 1. Use fill=TRUE to fill with NA (NULL for list colu
```

```
## 'data.frame': 52 obs. of 6 variables:
## $ Dato : chr "Tirsdag18.01.2022" "Onsdag19.01.2022" "Torsdag20.01.2022" "Tirsdag25.01.2022"
                           : chr "12:15-13:00" "12:15-16:00" "09:15-14:00" "14:15-17:00" ...
## $ Tid
                            : chr "HHT 01.202AUD" "VIRTUELT _Digital undervisning" "VIRTUELT _Digital undervisnin
## $ Rom
## $ Emnekode : chr "SOK-1006-1" "SOK-1006-1" "SOK-1006-1" "SOK-1006-1" ...
## $ Beskrivelse: chr "Forelesninger TromsøOppstartsmøte (digital undervisning) Opptak+live" "Forele
## $ Lærer : chr "D.J. Clark" "J. Thøgersen" "J. Thøgersen" "V. Andreassen" ...
## Warning: Expected 2 pieces. Missing pieces filled with `NA` in 23 rows [7, 10,
## 12, 14, 16, 17, 19, 21, 23, 25, 26, 28, 30, 32, 35, 38, 39, 42, 44, 46, ...].
## 'data.frame': 52 obs. of 6 variables:
## $ Uke : chr "03" "03" "03" "04" ...
                     : Date, format: "2022-01-18" "2022-01-19" ...
## $ Dato
## $ Dag
                      : chr "Tirsdag" "Onsdag" "Torsdag" "Tirsdag" ...
## $ Tid
                        : chr "12:15-13:00" "12:15-16:00" "09:15-14:00" "14:15-17:00" ...
                    : chr "HHT 01.202AUD" "VIRTUELT _Digital undervisning" "VIRTUELT _Digital undervisning"
## $ Rom
## $ Emnekode: chr "SOK-1006-1" "SOK-1006-1" "SOK-1006-1" "SOK-1006-1" ...
## Column 1 ['Uke 3'] of item 2 is missing in item 1. Use fill=TRUE to fill with NA (NULL for list colu
## 'data.frame': 25 obs. of 6 variables:
## $ Dato
                         : chr "Onsdag12.01.2022" "Tirsdag18.01.2022" "Torsdag27.01.2022" "Fredag11.02.2022" .
                           : chr "14:15-16:00" "10:15-12:00" "12:15-14:00" "12:15-14:00" ...
                            : chr "VIRTUELT _Digital undervisning" "VIRTUELT _Digital undervisning" "VIRTUELT _Di
## $ Rom
## $ Emnekode : chr "SOK-1016-1" "SOK-1016-1" "SOK-1016-1" "SOK-1016-1" ...
## $ Beskrivelse: chr "Forelesninger Tromsø" 
## $ Lærer : chr "E.C. Hvinden" "E.C. Hvinden" "E.C. Hvinden" "E.C. Hvinden" ...
## Warning: Expected 2 pieces. Missing pieces filled with `NA` in 1 rows [20].
## 'data.frame':
                                  25 obs. of 6 variables:
## $ Uke : chr "02" "03" "04" "06" ...
## $ Dato : Date, format: "2022-01-12" "2022-01-18" ...
## $ Dag : chr "Onsdag" "Tirsdag" "Torsdag" "Fredag" ...
                      : chr "14:15-16:00" "10:15-12:00" "12:15-14:00" "12:15-14:00" ...
## $ Tid
                        : chr "VIRTUELT _Digital undervisning" "VIRTUELT _Digital undervisning" "VIRTUELT _Digit
## $ Rom
## $ Emnekode: chr "SOK-1016-1" "SOK-1016-1" "SOK-1016-1" "SOK-1016-1" ...
timeplan <- bind_rows(timeplan)</pre>
```