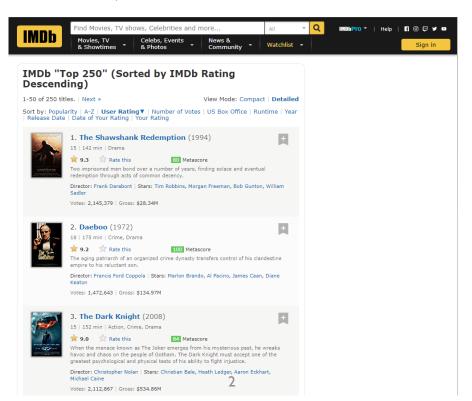


# Web Scraping: Movie Reviews

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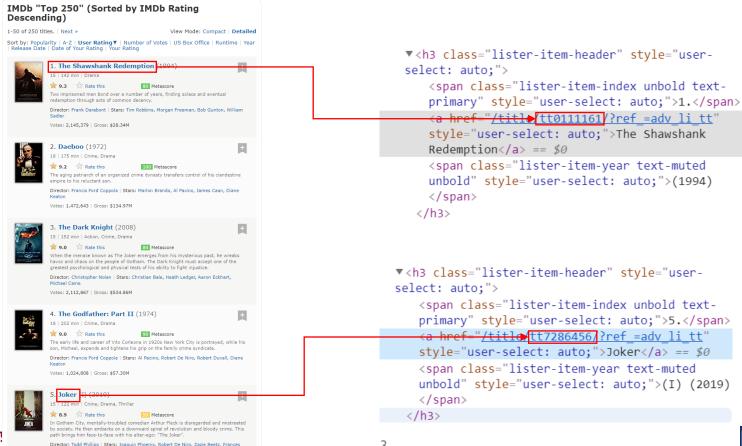
- Web scraping example 2: Movie review scraping (IMDB Top 50 Movies)
  - ✓ IMDB Top 250:
    - https://www.imdb.com/search/title/?groups=top\_250&sort=user\_rating
  - ✓ Collect Title, Year, Average Rating, Total Number of Ratings, Summary, Director, Writer, Review Rating, Review Title, Review Text







- Step 1: Understand the basic structure
  - √ A total of 250 movies are listed, each page contains 50 movies
  - ✓ Each movie has a unique ID





Votes: 267,033 | Gross: \$96.20M



• Step 2: Get the url of each movie





Step 2: Get the url of each movie

```
url <- 'https://www.imdb.com/search/title/?groups=top 250&sort=user rating'
 tmp list <- read html(url) %>% html nodes('h3.lister-item-header') %>%
                                   html nodes('a[href^="/title"]') %>% html attr('href')
> tmp list
[1] "/title/tt0111161/?ref =adv li tt" "/title/tt0068646/?ref =adv li tt" "/title/tt0468569/?ref =adv li tt"
    "/title/tt0071562/?ref =adv li tt" "/title/tt7286456/?ref =adv li tt" "/title/tt0167260/?ref =adv li tt"
[7] "/title/tt0110912/?ref =adv li tt" "/title/tt0108052/?ref =adv li tt" "/title/tt0050083/?ref =adv li tt"
[10] "/title/tt1375666/?ref =adv li tt" "/title/tt0137523/?ref =adv li tt" "/title/tt0120737/?ref =adv li tt"
[13] "/title/tt0109830/?ref =adv li tt" "/title/tt0060196/?ref =adv li tt" "/title/tt3417422/?ref =adv li tt"
[16] "/title/tt0167261/?ref =adv li tt" "/title/tt0133093/?ref =adv li tt" "/title/tt0099685/?ref =adv li tt"
[19] "/title/tt0080684/?ref =adv li tt" "/title/tt0073486/?ref =adv li tt" "/title/tt0056058/?ref =adv li tt"
[22] "/title/tt0816692/?ref =adv li tt" "/title/tt0317248/?ref =adv li tt" "/title/tt0245429/?ref =adv li tt"
[25] "/title/tt0120815/?ref =adv li tt" "/title/tt0120689/?ref =adv li tt" "/title/tt0118799/?ref =adv li tt"
[28] "/title/tt0114369/?ref_=adv_li_tt" "/title/tt0102926/?ref_=adv_li_tt" "/title/tt0076759/?ref_=adv_li_tt"
[31] "/title/tt0047478/?ref_=adv_li_tt" "/title/tt0038650/?ref_=adv_li_tt" "/title/tt6751668/?ref_=adv_li_tt"
    "/title/tt4154796/?ref_=adv_li_tt" "/title/tt4154756/?ref_=adv_li_tt" "/title/tt2582802/?ref_=adv_li_tt"
    "/title/tt1675434/?ref =adv li tt" "/title/tt0482571/?ref =adv li tt" "/title/tt0407887/?ref =adv li tt"
    "/title/tt0253474/?ref =adv li tt" "/title/tt0172495/?ref =adv li tt" "/title/tt0120586/?ref =adv li tt"
[43] "/title/tt0114814/?ref =adv li tt" "/title/tt0110413/?ref =adv li_tt" "/title/tt0110357/?ref_=adv_li_tt"
[46] "/title/tt0103064/?ref =adv li tt" "/title/tt0095765/?ref =adv li tt" "/title/tt0095327/?ref =adv li tt"
[49] "/title/tt0088763/?ref =adv li tt" "/title/tt0064116/?ref =adv li tt"
                                       Unique movie title ID
```





Meta Information on Each Movie

```
tmp url <- paste('http://imdb.com', tmp list[i], sep="")</pre>
 tmp content <- read html(tmp url)</pre>
                                                                        The Shawshank Redemption (19 x +
> tmp url
[1] "http://imdb.com/title/tt0111161/?ref =adv li tt"
                                                                                   imdb.com/title/tt0111161/?ref_=adv_li_tt
                                                                       🔡 앱 ★ Bookmarks 📙 Al 📙 Data Science 📙 English 📙 Investment 📙 Programming 📙 Research 📙 맛
                                                                                               Find Movies, TV shows, Celebrities and more...
                                                                                  IMDb
                                                                                                Movies, TV
                                                                                                                Celebs, Events
                                                                                                                                 News &
                                                                                                                                                Watchlist
                                                                                                                                 Community
                                                                                 FULL CAST AND CREW | TRIVIA | USER REVIEWS | IMDbPro
                                                                                                                                                  SHARE
                                                                                      The Shawshank
                                                                                       Redemption (1994)
                                                                                       15 | 2h 22min | Drama | 28 January 1995 (South Korea)
                                                                                  SHAWSHANK
                                                                                                                                        4 VIDEOS
                                                                                 Two imprisoned men bond over a number of years, finding solace and eventual redemption
                                                                                 through acts of common decency.
                                                                                 Director: Frank Darabont
                                                                                 Writers: Stephen King (short story "Rita Hayworth and Shawshank Redemption"),
                                                                                 Frank Darabont (screenplay)
```

Stars: Tim Robbins, Morgan Freeman, Bob Gunton | See full cast & crew >>



#### Title and Year

```
# Extract title and year
title_year <- tmp_content %>% html_nodes('div.title_wrapper > h1') %>% html_text %>% str_trim
tmp_title <- substr(title_year, 1, nchar(title_year)-7)
tmp_year <- substr(title_year, nchar(title_year)-4, nchar(title_year)-1)
tmp_year <- as.numeric(tmp_year)</pre>
```







#### Title and Year

```
# Extract title and year
   title year <- tmp content %>% html nodes('div.title wrapper > h1') %>% html text %>% str trim
   tmp title <- substr(title year, 1, nchar(title year)-7)</pre>
   tmp year <- substr(title year, nchar(title year)-1, nchar(title year)-1)
   tmp year <- as.numeric(tmp year)</pre>
> title year <- tmp content %>% html nodes('div.title wrapper > h1') %>% html text %>% str trim
> title year
[1] "The Shawshank Redemption (1994)"
  > tmp title <- substr(title year, 1, nchar(title year)-7)</pre>
  > tmp title
  [1] "The Shawshank Redemption"
  > tmp year <- substr(title year, nchar(title year)-4, nchar(title year)-1)</pre>
  > tmp year <- as.numeric(tmp year)</pre>
  > tmp year
  [1] 1994
```





### Average Rating

```
# Average rating
tmp_rating <- tmp_content %>% html_nodes('div.ratingValue > strong > span') %>% html_text
tmp_rating <- as.numeric(tmp_rating)</pre>
```







### Average Rating

```
# Average rating
tmp_rating <- tmp_content %>% html_nodes('div.ratingValue > strong > span') %>% html_text
tmp_rating <- as.numeric(tmp_rating)

> tmp_content %>% html_nodes('div.ratingValue > strong > span')
{xml_nodeset (1)}
[1] <span itemprop="ratingValue">9.3</span>
```





### Rating Counts

```
# Rating counts
tmp_count <- tmp_content %>% html_nodes('span.small') %>% html_text
tmp_count <- gsub(",", "", tmp_count)
tmp_count <- as.numeric(tmp_count)</pre>
```



```
<span class="small" itemprop=
"ratingCount" style="user-select: auto;">
2,145,379
```





### Rating Counts

> tmp\_count <- gsub(",", "", tmp\_count)</pre>

> tmp count <- as.numeric(tmp count)</pre>

```
# Rating counts
tmp_count <- tmp_content %>% html_nodes('span.small') %>% html_text
tmp_count <- gsub(",", "", tmp_count)
tmp_count <- as.numeric(tmp_count)

> tmp_count <- tmp_content %>% html_nodes('span.small') %>% html_text
> tmp_count
[1] "2,145,379"
```



> tmp\_count
[1] "2145379"

> tmp\_count
[1] 2145379



### Summary



▼ <div class="summary\_text" style="user-select: auto;"> == \$0

Two imprisoned men bond over a number of years, finding solace and eventual redemption through acts of common decency.

</div>

#### > tmp summary

[1] "Two imprisoned men bond over a number of ye ars, finding solace and eventual redemption through acts of common decency."

Director: Frank Darabont
Writers: Stephen King (short story "Rita Hayworth and Shawshank Redemption"),

Frank Darabont (screenplay)

through acts of common decency.

Stars: Tim Robbins, Morgan Freeman, Bob Gunton | See full cast & crew »





• Director, Writers, and Stars



```
▼<div class="credit summary item" style="user-
select: auto;">
   <h4 class="inline" style="user-select: auto;">
   Director:</h4>
   <a href="/name/nm0001104/?ref =tt ov dr" style=</pre>
   "user-select: auto;" Frank Darabont (/a> == $0
  </div>
▼<div class="credit summary item" style="user-
select: auto;">
   <h4 class="inline" style="user-select: auto;">
   Writers:</h4>
   <a href="/name/nm0000175/?ref =tt ov wr" style=</pre>
   "user-select: auto;">Stephen King</a>
   " (short story "Rita Hayworth and Shawshank
   Redemption"),
   <a href="/name/nm0001104/?ref =tt ov wr" style=</pre>
    "user-select: auto;">Frank Darabont</a>
   " (screenplay)
▼<div class="credit summary item" style="user-
select: auto;">
   <h4 class="inline" style="user-select: auto;">
   Stars:</h4>
   ka href="/name/nm0000209/?ref =tt ov st sm"
   style="user-select: auto;">Tim Robbins</a>
    <a href="/name/nm0000151/?ref =tt ov st sm"</pre>
   style="user-select: auto;">Morgan Freeman</a>
    <a href="/name/nm0348409/?ref =tt ov st sm"</pre>
   style="user-select: auto;">Bob Gunton</a>
   <span class="ghost" style="user-select: auto;">
   </span>
   <a href="fullcredits/?ref =tt ov st sm" style=</pre>
   "user-select: auto;">See full cast & crew</a>
    " »
```





</div></div>

Director, Writers, and Stars

```
tmp dws <- tmp content %>% html nodes('div.credit summary item') %>% html text
tmp director <- tmp dws[1] %>% str trim
tmp director <- sub("Director:\n", "", tmp director)</pre>
tmp writer <- tmp dws[2] %>% str trim
tmp writer <- sub("Writers:\n", "", tmp writer)</pre>
tmp stars <- tmp dws[3] %>% str trim
tmp stars <- strsplit(tmp stars, "\nSee")[[1]][1]</pre>
tmp_stars <- sub("Stars:\n", "", tmp stars)</pre>
tmp stars <- substr(tmp stars, 1, nchar(tmp stars)-1) %>% str trim
> tmp dws
[1] "\n
               Director:\nFrank Darabont
[2] "\n
               Writers:\nStephen King (short story \"Rita Hayworth and Shawshank Redempt
ion\"), Frank Darabont (screenplay)
[3] "\n
                                                                               \nSee full ca
               Stars:\nTim Robbins, Morgan Freeman, Bob Gunton
```



st & crew »\n



Director, Writers, and Stars

#### ✓ Director

```
> tmp_director <- tmp_dws[1] %>% str_trim
> tmp_director
[1] "Director:\nFrank Darabont"
> tmp_director <- sub("Director:\n", "", tmp_director)
> tmp_director
[1] "Frank Darabont"
```

#### ✓ Writers

```
> tmp_writer <- tmp_dws[2] %>% str_trim
> tmp_writer
[1] "Writers:\nStephen King (short story \"Rita Hayworth and Shawshank Redemption\"), Fr
ank Darabont (screenplay)"
> tmp_writer <- sub("Writers:\n", "", tmp_writer)
> tmp_writer
[1] "Stephen King (short story \"Rita Hayworth and Shawshank Redemption\"), Frank Darabo
nt (screenplay)"
```





Director, Writers, and Stars





Scrap the First 25 Reviews for Each Movie

```
# Extract the first 25 reviews
title_id <- strsplit(tmp_list[i], "/")[[1]][3]
review_url <- paste("https://www.imdb.com/title/", title_id, "/reviews?ref_=tt_urv", sep="")

tmp_review <- read_html(review_url) %>% html_nodes('div.review-container')

> title_id
[1] "tt0111161"
> review_url <- paste("https://www.imdb.com/title/", title_id, "/reviews?ref_=tt_urv", s
ep="")
> review_url
[1] "https://www.imdb.com/title/tt0111161/reviews?ref =tt_urv"
```





Scrap the First 25 Reviews for Each Movie

```
> tmp review
{xml nodeset (25)}
 [1] <div class="review-container">\n
                                              <div class="lister-item-content">\n
 [2] <div class="review-container">\n
                                              <div class="lister-item-content">\n
 [3] <div class="review-container">\n
                                              <div class="lister-item-content">\n
 [4] <div class="review-container">\n
                                              <div class="lister-item-content">\n<a</pre>
 [5] <div class="review-container">\n
                                              <div class="lister-item-content">\n
 [6] <div class="review-container">\n
                                              <div class="lister-item-content">\n
 [7] <div class="review-container">\n
                                              <div class="lister-item-content">\n
 [8] <div class="review-container">\n
                                              <div class="lister-item-content">\n
 [9] <div class="review-container">\n
                                              <div class="lister-item-content">\n
[10] <div class="review-container">\n
                                              <div class="lister-item-content">\n
                                              <div class="lister-item-content">\n<a</pre>
[11] <div class="review-container">\n
[12] <div class="review-container">\n
                                              <div class="lister-item-content">\n
[13] <div class="review-container">\n
                                              <div class="lister-item-content">\n
                                              <div class="lister-item-content">\n
[14] <div class="review-container">\n
[15] <div class="review-container">\n
                                              <div class="lister-item-content">\n
[16] <div class="review-container">\n
                                              <div class="lister-item-content">\n
[17] <div class="review-container">\n
                                              <div class="lister-item-content">\n
[18] <div class="review-container">\n
                                              <div class="lister-item-content">\n
[19] <div class="review-container">\n
                                              <div class="lister-item-content">\n
                                                                                      . . .
[20] <div class="review-container">\n
                                              <div class="lister-item-content">\n
```





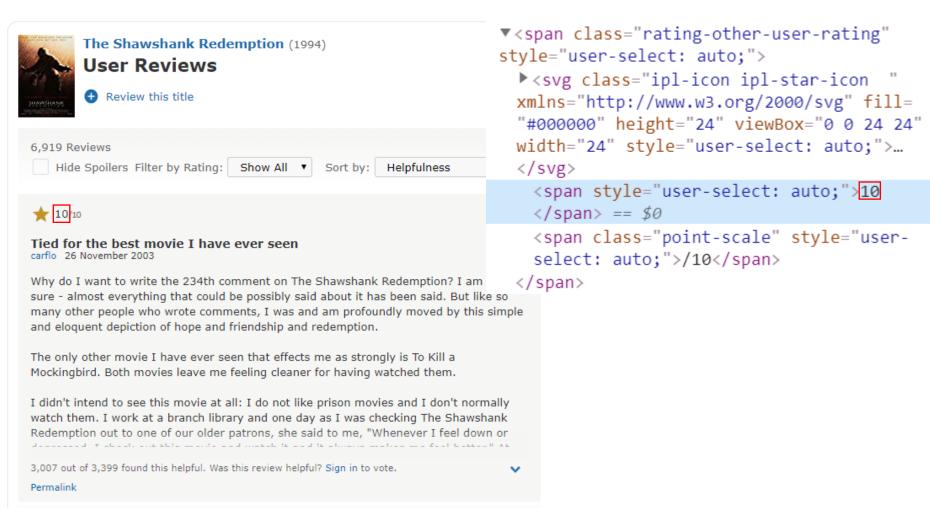
- (Note): To skip unexpected errors, use tryCatch function
  - ✓ Do the instruction inside the tryCatch
  - ✓ If there is an error, store NULL to the title

```
tryCatch({
  # Review rating
  tmp info <- tmp review[j] %>% html nodes('span.rating-other-user-rating > span') %>% html text
  tmp review rating <- as.numeric(tmp info[1])</pre>
  # Review title
  tmp review title <- tmp review[j] %>% html nodes('a.title') %>% html text
  tmp review title <- tmp review title %>% str trim
  # Review text
  tmp review text <- tmp review[j] %>% html nodes('div.text.show-more control') %>% html text
  tmp_review_text <- gsub("\\s+", " ", tmp_review_text)</pre>
  tmp_review_text <- gsub("\"", "", tmp_review_text) %>% str_trim
  # Store the results
  imdb top 50[cnt,1] <- tmp title
  imdb top 50[cnt,2] <- tmp year
  imdb_top_50[cnt,3] <- tmp_rating</pre>
  imdb top 50[cnt,4] <- tmp count
  imdb top 50[cnt,5] <- tmp summary</pre>
  imdb top 50[cnt,6] <- tmp director
  imdb top 50[cnt,7] <- tmp writer
  imdb top 50[cnt,8] <- tmp stars</pre>
  imdb top 50[cnt,9] <- tmp review rating
  imdb top 50[cnt,10] <- tmp review title</pre>
  imdb top 50[cnt,11] <- tmp_review_text</pre>
  cnt <- cnt+1
  }, error = function(e){print("An error occurs, skip the review")
```





### Review Rating





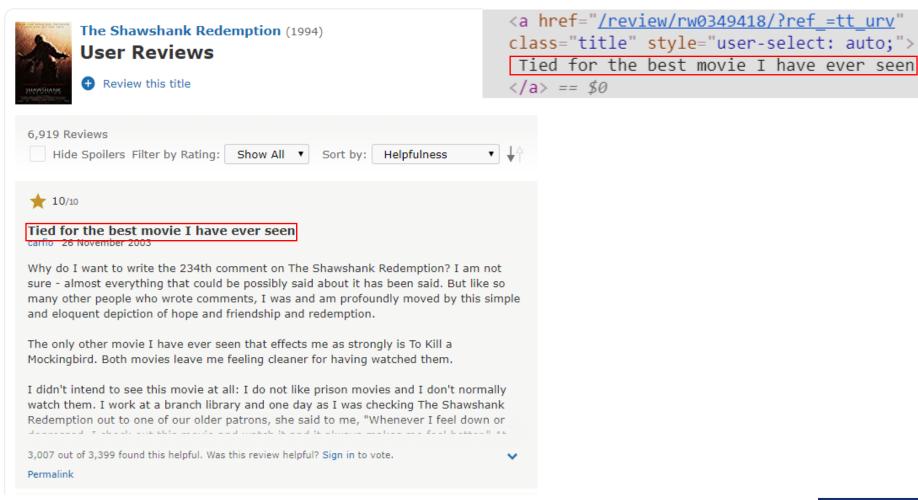


### Review Rating





#### Review Title







#### Review Title

[1] "The Shawshank Redemption"

```
# Review title
tmp_review_title <- tmp_review[j] %>% html_nodes('a.title') %>% html_text
tmp_review_title <- tmp_review_title %>% str_trim

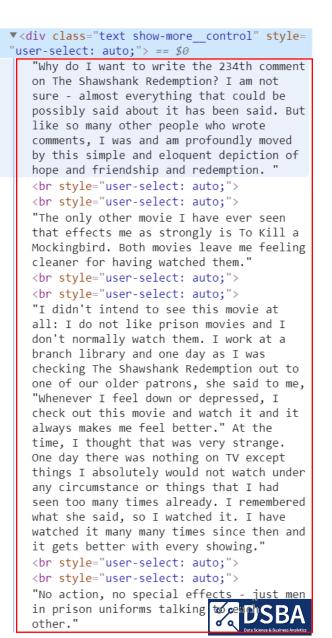
> tmp_review_title <- tmp_review[j] %>% html_nodes('a.title') %>% html_text
> tmp_review_title
[1] " Tied for the best movie I have ever seen\n"
> tmp_review_title <- tmp_review_title %>% str_trim
> tmp_review_title
```





#### Review Text







#### Review Text

> tmp review text

```
# Review text
tmp_review_text <- tmp_review[j] %>% html_nodes('div.text.show-more__control') %>% html_text
tmp_review_text <- gsub("\\s+", " ", tmp_review_text)
tmp_review_text <- gsub("\\"", "", tmp_review_text) %>% str_trim

> tmp_review_text <- tmp_review[j] %>% html_nodes('div.text.show-more__control') %>% html_text
> tmp_review_text <- gsub("\\s+", " ", tmp_review_text)
> tmp_review_text <- gsub("\\s+", " ", tmp_review_text)</pre>
```

[1] "Why do I want to write the 234th comment on The Shawshank Redemption? I am not sure - almost everything that could be possibly said about it has been said. But like so many other people who wrote comments, I was a nd am profoundly moved by this simple and eloquent depiction of hope and friendship and redemption. The only other movie I have ever seen that effects me as strongly is To Kill a Mockingbird. Both movies leave me feeling cleaner for having watched them. I didn't intend to see this movie at all: I do not like prison movies and I don't normally watch them. I work at a branch library and one day as I was checking The Shawshank Redemption out to one of our older patrons, she said to me, Whenever I feel down or depressed, I check out this movie and watch it and it always makes me feel better. At the time, I thought that was very strange. One day there was nothing on TV except things I absolutely would not watch under any circumstance or things that I had seen too many times alr... <truncated>





#### Store the Results

```
# Store the results
imdb_top_50[cnt,1] <- tmp_title
imdb_top_50[cnt,2] <- tmp_year
imdb_top_50[cnt,3] <- tmp_rating
imdb_top_50[cnt,4] <- tmp_count
imdb_top_50[cnt,5] <- tmp_summary
imdb_top_50[cnt,6] <- tmp_director
imdb_top_50[cnt,7] <- tmp_writer
imdb_top_50[cnt,8] <- tmp_stars
imdb_top_50[cnt,9] <- tmp_review_rating
imdb_top_50[cnt,10] <- tmp_review_title
imdb_top_50[cnt,11] <- tmp_review_text</pre>
```





- Post-processing
  - ✓ Assign the column names
  - ✓ Store the result as a Rdata and csv file









