

Final Project(Group Activity)

BSIT-2B

2023-12-14

```
library(rvest)
```

```
## Warning: package 'rvest' was built under R version 4.3.2
```

```
library(stringr)
```

```
## Warning: package 'stringr' was built under R version 4.3.2
```

```
library(tm)
```

```
## Warning: package 'tm' was built under R version 4.3.2
```

```
## Loading required package: NLP
```

```
library(wordcloud)
```

```
## Warning: package 'wordcloud' was built under R version 4.3.2
```

```
## Loading required package: RColorBrewer
```

```
library(dplyr)
```

```
## Warning: package 'dplyr' was built under R version 4.3.2
```

```
##
```

```
## 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(ggplot2)
```

```
## Warning: package 'ggplot2' was built under R version 4.3.2
```

```
##
```

```
## Attaching package: 'ggplot2'
```

```
## The following object is masked from 'package:NLP':
```

```
##
```

```
##      annotate
```

```
library(syuzhet)
```

```
## Warning: package 'syuzhet' was built under R version 4.3.2
```

```
extract_reviews <- function(url) {  
  page <- read_html(url)
```

```
  review_text <- page %>% html_nodes(".text_content") %>%  
    html_text()
```

```
  reviews_df <- data.frame(  
    Text_Review = review_text[1:10]  
  )
```

```
  return(reviews_df)  
}
```

```
base_url <- "https://www.airlinequality.com/airline-reviews/porter-airlines/page/"
```

```
all_reviews_df <- data.frame()
```

```
for (page_number in 1:37) {  
  url <- paste0(base_url, page_number, "/")
```

```
  reviews_page <- extract_reviews(url)
```

```
  all_reviews_df <- rbind(all_reviews_df, reviews_page)  
}
```

```
all_reviews_df <- all_reviews_df[1:300,]
```

```
all_reviews_df <- data.frame(Text_Review = all_reviews_df)
```

```
View(all_reviews_df)
```

```
write.csv(all_reviews_df, file = "reviewDataset.csv", row.names = FALSE)
```

```
#data cleaning
```

```
cleaned_text <- all_reviews_df$Text_Review
```

```
#clean text using gsub
```

```
cleaned_text <- str_replace_all(cleaned_text, " Trip Verified | Not Verified |Not Verified | Verified
```

```

cleaned_text <- gsub("\\\\", "", cleaned_text)
cleaned_text <- gsub("\\s+", " ", cleaned_text)
cleaned_text <- gsub("[[:punct:]]", "", cleaned_text)
cleaned_text <- gsub("[[:digit:]]", "", cleaned_text)
cleaned_text <- str_replace_all(cleaned_text, "[^a-zA-Z0-9]", " ")

# display the cleaned text example...
head(cleaned_text)[1:5]

```

```

## [1] " Porter destroyed my luggage and then did not make it right at all Three large holes two wheels
## [2] " Porter is a great option if you want a flight delay Ive never seen an airline get delayed as m
## [3] " Flight was at pm Loaded the flight told to unload the flight given no communication whatsover
## [4] " Best food Ive ever had on a plane and Im a chef Fantastic service nice new plane impeccably cl
## [5] " I cannot recommend to anyone to fly with Porter We had one flight with them on October a di

```

```

# create a Corpus object
wordCorpus <- Corpus(VectorSource(cleaned_text))

wordCorpus <- tm_map(wordCorpus, content_transformer(tolower))

```

```

## Warning in tm_map.SimpleCorpus(wordCorpus, content_transformer(tolower)):
## transformation drops documents

```

```

wordCorpus <- tm_map(wordCorpus, removePunctuation)

```

```

## Warning in tm_map.SimpleCorpus(wordCorpus, removePunctuation): transformation
## drops documents

```

```

wordCorpus <- tm_map(wordCorpus, removeNumbers)

```

```

## Warning in tm_map.SimpleCorpus(wordCorpus, removeNumbers): transformation drops
## documents

```

```

wordCorpus <- tm_map(wordCorpus, removeWords, stopwords("english"))

```

```

## Warning in tm_map.SimpleCorpus(wordCorpus, removeWords, stopwords("english")):
## transformation drops documents

```

```

wordCorpus <- tm_map(wordCorpus, removeWords, stopwords("SMART"))

```

```

## Warning in tm_map.SimpleCorpus(wordCorpus, removeWords, stopwords("SMART")):
## transformation drops documents

```

```

wordCorpus <- tm_map(wordCorpus, stripWhitespace)

```

```

## Warning in tm_map.SimpleCorpus(wordCorpus, stripWhitespace): transformation
## drops documents

```

```
#additional removal of specific words
```

```
wordCorpus <- tm_map(wordCorpus, removeWords, c("rep", "checkin", "tarmac", "m", "ins", "s", "inperson"
```

```
## Warning in tm_map.SimpleCorpus(wordCorpus, removeWords, c("rep", "checkin", :  
## transformation drops documents
```

```
wordCorpus <- tm_map(wordCorpus, removeWords, c("fo", "dec", "embraer", "ee", "ckal", "c", "st", "tha"
```

```
## Warning in tm_map.SimpleCorpus(wordCorpus, removeWords, c("fo", "dec",  
## "embraer", : transformation drops documents
```

```
wordCorpus <- tm_map(wordCorpus, removeWords, c("ons", "suff", "delayedcancelled", "possibleitsurely", "
```

```
## Warning in tm_map.SimpleCorpus(wordCorpus, removeWords, c("ons", "suff", :  
## transformation drops documents
```

```
wordCorpus <- tm_map(wordCorpus, removeWords, c("q", "bombardier", "turboprops", "drinkssnacksalcohol", "
```

```
## Warning in tm_map.SimpleCorpus(wordCorpus, removeWords, c("q", "bombardier", :  
## transformation drops documents
```

```
wordCorpus <- tm_map(wordCorpus, removeWords, c("ste", "immigrationcustom", "hyatt", "x", "ottawatoront"
```

```
## Warning in tm_map.SimpleCorpus(wordCorpus, removeWords, c("ste",  
## "immigrationcustom", : transformation drops documents
```

```
#display some cleaned content
```

```
wordCorpus$content[1:300]
```

```
## [1] " porter destroyed luggage make large holes wheels ripped spoke airport told call person phone  
## [2] " porter great option flight delay ive airline delayed porter air canada dollars extra ticket v  
## [3] " flight pm loaded flight told unload flight communication whatsoever lodging flight told flight  
## [4] " food ive plane im chef fantastic service nice plane impeccably clean pretty comfortable seat  
## [5] " recommend fly porter flight october direct flight layovers lost checked bag checked bag toron  
## [6] " give raving review porter experience pleasant stepping back charming whimsical modern conven  
## [7] " family member passed unexpectedly flight called cancel return fare money charge seat wont mal  
## [8] " flown porter airlines times friendly staff great flight service food drinks delayed flight t  
## [9] " airline doesnt electronic boarding pass purchase reserve ticket basic ticket force counter p  
## [10] " amazing airline time middle seat food choices purchase amazing healthy staff great porter mal  
## [11] " wanted great airline lots room trouble friendly staff toronto halifax return great journeys"  
## [12] " disappointed porter airlines time flying company connecting flight italy arrived montreal pm  
## [13] " flight short comfortable onboard small bag passengers stored luggage received bag broken han  
## [14] " smooth flight crew fantastic star food great havent good food plane loved porter "  
## [15] " wonderful flight free internet serve snacks drinks red white wine types juices coffe tea free  
## [16] " complaint groundcrew airport wife assistance wheel chair assistance requested acknowledged  
## [17] " porter terrible airline originally excited high hopes extremely disappointed flight delayed r  
## [18] " flight cancelled due weather minutes supposed flight booked day porter staff informed circum  
## [19] " worst airline ive experienced cancelled flight hours flight time rebooked night option direc  
## [20] " problems happen plane sitting hour time announce canceling flight problem washroom ridiculous
```

[21] " porter cancelling flights thunder mondays morning flight cancelled sunday pm flight crew sh
 ## [22] " air canada timmins toronto fly route frequently airlines porter porter review relate quali
 ## [23] " time fly porter airlines heard airline family member confused book flight choose air canada
 ## [24] " time flying porter airline bit worried airfare expensive airlines flights porter airline "
 ## [25] " booking flight airline context family vacation visit arrived airport flight couple minutes
 ## [26] " airline worried destination time flight delayed causing miss connection didnt rebook connect
 ## [27] " wonderful staff met staff inspired write review ordinary flight similar flights trouble case
 ## [28] " flight united vancouver canceled due weather rebooked days vancouver catch train frantic se
 ## [29] " person wheelchair needing special assistance due unpredictable weather day chose fly home fl
 ## [30] " flight cancelled due weather conditions rescheduling suggestion didnt work cancelled booking
 ## [31] " scheduled fly quebec city toronto sunday june pm flight delayed minutes cancelled explanation
 ## [32] " time flying porter airline business charging bring carry understand budget airlines ryanair p
 ## [33] " flight june great service start finish flight attendants accommodating attentive experience
 ## [34] " experience porter amazing day flight cancel fathers flight join trip anymore realized ended
 ## [35] " frequent business traveler experienced poor customer service porter flight boston ottawa can
 ## [36] " staff attentive caring checked frequently travelling year made feel extremely cared wonderfu
 ## [37] " cabin staff pleasant pm porter flight back canceled due maintenance issues rebooked pm flight
 ## [38] " flew vancouver halifax connecting flight toronto april return flight vancouver april booked
 ## [39] " time flying porter nightmare landed ottawa flight cancelled pm delayed due mechanical issues
 ## [40] " porter airlines quick efficient rectifying issues reimbursed clothing needed purchased bagga
 ## [41] " airline mess called days prior flight questions baggage allowed wasnt warned expect lose bag
 ## [42] " terrible experience porter lost checked bag trip whistler inside checked bag worth snowboa
 ## [43] " originally booked flight paid extra fees ensure make change cancel receive full refund liter
 ## [44] " cancelled flight halifax toronto due coming storm toronto cancelled flight leaving hour
 ## [45] " ridiculously unreliable hours flight received notice cancelled ticket transferred flight lea
 ## [46] " cancelled outbound return flights informed change outbound flight offer flight arrived day r
 ## [47] " booked tickets trip toronto calgary weeks ago coming march break days departure date receive
 ## [48] " booked fly calgary toronto march flight cancelled due bad weather toronto email confirmation
 ## [49] " porter airlines unreliable flight cancelled rebooked flight days original customer service an
 ## [50] " worst airline company customer service completely professional hated experience recommend p
 ## [51] " booked ticket toronto montreal directly website personal mail id contact details cancelled f
 ## [52] " pleasure start finish flying porter specific flight amenities great wifi free snacks free p
 ## [53] " flew porter time inaugural flight yul plane brand delivered cckql seat boarding started m
 ## [54] " emma flight attendant working flight toronto newark departed pm january wonderful kind eff
 ## [55] " absolute worst experience airplane left montreal short flight toronto catch connection back
 ## [56] " save fly airline porter airlines flight montreal toronto diverted sudbury waited small holdin
 ## [57] " flight suddenly delayed hour hour knew weather forecast bad day advance started offering din
 ## [58] " horrible customer service unreliable seat recline wifi board airline app horrible experience
 ## [59] " unreliable airline flight toronto canceled rebooked hours flight delayed hour total hours de
 ## [60] " flight cancelled due weather rebooked option credit year lose money dont communicate decisio
 ## [61] " absolute worst airline ive flown original flight cancelled airline notice put flight cancell
 ## [62] " flight delayed irritating part big ive flights past week fine attendant doesnt fit youll ch
 ## [63] " set flyout nov pick car toronto email flight delayed pm bad things happen switch flight onli
 ## [64] " disappointing fee carry luggage barely feels premium airline branding give top dont opt dont
 ## [65] " rows plane sleep flight attendants couldnt stop talking flight skateboarding scooters sleep
 ## [66] " received email letting flight morning cancelled pm night rebooked flight days laterr connect
 ## [67] " traveled washington porter airlines wheelchair assist left therapy cushion airport lounge a
 ## [68] " crawl destination fly airline customer service unbelievably bad facilities dirty uncomfortab
 ## [69] " thunder toronto time weekend minute cancellation explanation compensation wait flight day h
 ## [70] " newark thunder toronto part poor experience porter due weather porters control understand h
 ## [71] " cancelled flight delaying flight times cancelled booked flight day delayed worst flying expe
 ## [72] " porter airlines montreal toronto flight supposed pm told luggage travel luggage flight pm ti
 ## [73] " booking flight visit family based fb promotional ads promoting fees cancellations purchased
 ## [74] " booked flight porter airlines canceled flights atlantic provinces including flights money b

[75] " happy experience friendly employees interior planes looked recently updated happy avoid fly
 ## [76] " toronto montreal continue impressed service porter friends travelling returning home covid
 ## [77] " fredericton ottawa bad experience flight waiting flight delayed times total hours minutes lo
 ## [78] " ottawa toronto flight cancelled airline plane trouble bumped flight landed minutes ago sittin
 ## [79] " ottawa fredericton sit hours fly hours plane warm air didnt work understand hour delay hours
 ## [80] " fredericton ottawa porter isnt airline size quantity time flown porter times single flight d
 ## [81] " ottawa newark toronto received alert days prior flight due weather flight delayed cancelled
 ## [82] " toronto ottawa flown porter airlines ten times years ago gave stars back havent flown month
 ## [83] " halifax toronto ottawa charged bags big carry fine charge board paid cabin force check bag
 ## [84] " ottawa toronto enjoyed flying porter toronto city airport great experience landing toronto i
 ## [85] " newark toronto booking page repeatedly showed booking urgent flight unsuccessful attempts cha
 ## [86] " received boarding pass due counter fly back montreal verified review november issues didnt m
 ## [87] " montreal boston toronto august delay missed flight boston stop toronto arrived toronto pro
 ## [88] " toronto montreal hearing disability miscommunication missed flight fault anyones extent staf
 ## [89] " timmins ottawa toronto flown week porter basic airfare assumed bag things acceptable return
 ## [90] " halifax toronto montreal brutal baggage fees airline rude ground staff charged dollars small
 ## [91] " newark toronto lovely flight friendly flight attendants leather seats cabin ambience free be
 ## [92] " toronto terrible customer service worst experience charged bag couldnt fit bags"
 ## [93] " halifax montreal waited hour minutes luggage porter representatives told wait flights check
 ## [94] " flew ottawa halifax wife acknowledge fantastic care received employee porter airlines helped
 ## [95] " ottawa saint john purchased tickets costing due medical emergency cancel vacation porter air
 ## [96] " toronto customer service rude lied size luggage charge money charge small carry luggage l
 ## [97] " toronto worst customer service checking bags website lies size carry bags staff care check
 ## [98] " colleague plane marie ontario billy bishop airport toronto boarded plane pm estimated time
 ## [99] " toronto montreal great experience porter flight attendants customer service people polite bo
 ## [100] " toronto boston leg journey gate agent call ahead hold plane due long line security apparently
 ## [101] " board service great smiling flight attendants dealt unforeseen circumstance day flying wife
 ## [102] " halifax ottawa difference standard basic chose book basic charged golf bag told carry allow
 ## [103] " worst staff attitude montreal toronto forgot portable charger ny toronto flight credit cards
 ## [104] " times ive flown traveled porter airlines worst travel easter weekend purchasing nonstop fligh
 ## [105] " montreal thunder toronto todd sandra helpful today wanted point efforts flight boarding due
 ## [106] " chicago toronto porter airlines paid premium flight agent charged carry bag insisted check f
 ## [107] " toronto newark depart ticket impossible airline leave time communicate delays expects airline
 ## [108] " traveled porter times inception grow participated growing pains thrilled level service recei
 ## [109] " montreal toronto happy service porter airlines advertises cheap prices surprise extra fees ca
 ## [110] " porter fallen level service quality lounge permanently closed cheapest fares basic include
 ## [111] " toronto montreal completely changed years rip baggage fee dont book online dont arrive airpor
 ## [112] " toronto washington good days customer perspective ive flying porter years literally day open
 ## [113] " newark toronto appalled bad airline loud planes wifi worse fact huge snowstorm hitting day
 ## [114] " received terrible customer service life flight moncton ottawa cancelled due weather condition
 ## [115] " lost luggage hour flight sudbury toronto checked bags made reasoning due loading unloading ex
 ## [116] " toronto love porter free food drinks staff lovely flight awful walked picking nails didnt g
 ## [117] " toronto newark flying family pregnant fly porter seasoned traveling family kids dog wife prep
 ## [118] " johns halifax horrible airline time made remove stuff carry weight broke suitcase received
 ## [119] " toronto boston simply put porter airlines deliver money book flights times repeatedly cancel
 ## [120] " halifax ottawa porter airlines charge carry book party recently hit dollar fee lb carry bag
 ## [121] " newark toronto closed gate minutes departure plane gate board hours issued boarding pass fli
 ## [122] " toronto city montreal flight late departing option select seat check fee years airlines meal
 ## [123] " toronto newark nice experience porter airlines arrived automatically offered ticket earlier
 ## [124] " washington toronto flew porter washington friday flight delayed hour minutes montreal made
 ## [125] " family stressful experience porter airlines flight canceled back toronto boston miss days wo
 ## [126] " fly toronto marie pm september porter flight cancelled day received email cancellation goo
 ## [127] " halifax toronto cancel flight hours leaving web site hours refund dollar credit return fligh
 ## [128] " montreal halifax flight cancelled reason anticipated toronto airshow staff airport rude unab

[129] " chicago montreal toronto stay plane underwent maintenance minute people diverted flights back
 ## [130] " halifax toronto porter cancelled flight warning minutes flight supposed leave minutes flight
 ## [131] " flight halifax montreal personnel screen flight cancelled air canada porter agent minutes ge
 ## [132] " montreal newark toronto flying porter time flight cancelled minute alternative provided day p
 ## [133] " toronto montreal porter premium access cool perks means ive consistently delayed disrupted ca
 ## [134] " halifax johns flown porter today airline charged carry bag airport didnt money coz wasnt pr
 ## [135] " johns montreal negative experience porter flight showed approximately pm flight showed drive
 ## [136] " quebec toronto cancelledrebooked flights quebec weather conditions preventing flights unders
 ## [137] " timmins toronto disappointed wait airplane landing aircraft boarding made miss plans pick a
 ## [138] " minute trip montreal summer flight fine problems home washington connecting flight toronto
 ## [139] " toronto newark porter west airline flight delayed minutes cancelled booked flight hours commu
 ## [140] " newark toronto porter manage minor weather delays spiralling control delays minor interrupti
 ## [141] " ottawa halifax flight delayed canceled talk customer service problem weather fault refund ti
 ## [142] "boston toronto original flight friday cancelled rebooked saturday afternoon pm attempt made c
 ## [143] " booked flight toronto chicago round trip routes significant delay porter airport downtown to
 ## [144] " toronto halifax ottawa cancellation flight turned weekend trip explore province meet friend
 ## [145] " newark toronto airline frustrate travellers flight originally supposed leave pm time pm dela
 ## [146] " toronto quebec city ridiculous flight delayed overbooked theyre offering flight days downtow
 ## [147] " quebec city toronto delaying flight hour minutes adding minute delays minutes porter offered
 ## [148] " washington toronto flight delayed hours washington hours back times communication existent c
 ## [149] " monttremblant toronto flight due feb porter rebooked feb days reason bad weather compensation
 ## [150] " porter airlines toronto flight cancelled stated due weather radar shows rain high winds of
 ## [151] " boston toronto recently flew airline short commuter flight approx mins flight delayed minut
 ## [152] " wife wanted toronto porter expensive read reviews worried werent good trip toronto back exce
 ## [153] " ottawa halifax return booking flights halifax weekend getaway looked airlines choice fell po
 ## [154] " travelling montreal stop toronto change planes coming leg trip plane delayed minimum minutes
 ## [155] " toronto boston frequent flyer airline good fantastic bad disaster good higher tiers vip statu
 ## [156] " toronto newark delayed departure minutes absolutely terrible airline literally planes time f
 ## [157] " montreal toronto time porter pleased service desk small issue passport details sorted compl
 ## [158] " boston toronto time flying porter ways flights delayed hours moments notice told gate should
 ## [159] " halifax extremely disappointed porter delayed flight hours supposedly part plane boarded ha
 ## [160] " toronto newark worst airline flown constantly cancel flights moments notice due issues crew
 ## [161] " toronto sudbury round trip flights porter month period return flights cancelled porter fulfil
 ## [162] " sit wait phone hour half receive refund bothers pick understand ice storm airline fly sunday
 ## [163] " boston toronto broken foot boston needed home casted hopes avoid surgery storm toronto porte
 ## [164] " quebec washington beware minutes boarding flight cancelled put flight days small airline pa
 ## [165] " newark toronto city youd downtown save time wont airline lacks organization flights delayed
 ## [166] " newark toronto received email original flight time newark toronto cancelled rescheduled che
 ## [167] " due fly porter airlines newark toronto city airline unorganized friend told moved earlier fl
 ## [168] " flew toronto chicago porter flight downtown island airport convenient ive time flight porter
 ## [169] " newark toronto city im airline bothers flight times show hours flight flown numerous times d
 ## [170] " thunder timmins toronto today great pleasure fly time efficient friendly porter airlines pr
 ## [171] " booked fly johns toronto delayed hours cancelling delayed rebooked flight hour sitting plane
 ## [172] " toronto washington speaking customer service agents opposite helpful told agents delayed fli
 ## [173] " toronto boston fly company supposed leaving pm didnt leave pm arrived toronto connecting fli
 ## [174] " toronto halifax time flying row flight hours late time missed family dinner sunny clean place
 ## [175] " toronto city quebec city experience porter airlines exceptional trip city airport easy conver
 ## [176] " time fly porter flight ottawa late hour flying back toronto cancelled flight hour informati
 ## [177] " porter airlines delayed return flight toronto timmins november disaster ultimately diverting
 ## [178] " super delayed flight marie toronto captain couldnt speak blurred english feel unsure chose
 ## [179] " fly porter thought airline fly bishop toronto closer downtown fares cheaper air canada tur
 ## [180] " return flight washington dulles toronto city airport bit worried flying porter reading negat
 ## [181] " toronto montreal flight late porter posting time departure minutes flight leaving minutes la
 ## [182] " toronto chicago fact didnt board time didnt bother im bit overweight belly area problem plane

[183] " flights total delayed disorganized staff rude inattentive ridiculous delayed write reviews r
 ## [184] " ottawa moncton flight cancelled lack communication long holds phone unable assist helping du
 ## [185] " fly porter airlines flight fredericton ottawa adviser rude addition charged extra checkedin l
 ## [186] " fly porter airlines leaving washington flight delayed hours causing miss connecting flight
 ## [187] " biggest fan recommend knew friends clients live work toronto back times year visit family w
 ## [188] " toronto chicago experienced bad customer service porter time boyfriend booked flight porter
 ## [189] " airport security received email porter flight toronto cancelled half flight rescheduled fli
 ## [190] " recent flight timmins toronto scheduled depart pm august departing airport checked status fl
 ## [191] " toronto ottawa delays cancellations airline good started ontime priced single time flown mon
 ## [192] " porter worst airline flown travel flight cancelled rescheduled day rebooked connection delay
 ## [193] " porter airlines flight fine pretty smooth type planes flight delayed day delayed additional
 ## [194] " flight cancelled hours prior reason weather sunny clear toronto timmins online check request
 ## [195] " flight sudbury toronto today cancelled hours notice picked mid day flight expecting rebooked
 ## [196] " montreal toronto extremely long delays montreal july montreal august chose fly opposed dr
 ## [197] " sudbury chicago toronto booked weekend trip chicago outbound flight cancelled friday evening
 ## [198] " halifax toronto started flying porter airlines time year perfect solution trips ive canada e
 ## [199] " newark toronto arrival newark told flight cancelled due rain toronto rebooked flight days da
 ## [200] " toronto boston flight delayed minute intervals announcement caused delay indication flight d
 ## [201] " ottawa timmins toronto worst trip life cancelled leg trip completed cancelled reason beautif
 ## [202] " flying halifax toronto monday morning minutes departure announcement flight delayed hour due
 ## [203] " fly ottawa regularly totally disappointed service recently worse direct flight ottawa fail
 ## [204] " toronto marie received email flight cancelled rebooked flight day problem flight day neede
 ## [205] " extremely poor service received today flight delayed asked board earlier flight told wait bo
 ## [206] " staff good small planes delayed due weather flight toronto newark delayed hours flight cance
 ## [207] " flew timmins montreal toronto traveled times porter airlines times flight delayed canceled d
 ## [208] " worst airline porter time ottawa toronto good reviews delayed flight pm pm pm reimbursement
 ## [209] " scheduled fly washington toronto city june pm porter cancelled flight reason announced publi
 ## [210] " halifax ottawa great airline rest experienced issues porter amending seats paid telling show
 ## [211] " flight boston montreal require days supposed fly boston montreal toronto june leg toronto m
 ## [212] " ottawa toronto plane porter amazing airline problem making onboard question cancelled flight
 ## [213] " booked flight boston toronto friday june flight cancelled explanation rebooked june pm days
 ## [214] " flying porter disappointment back month years beginning multiple times fly porter flight d
 ## [215] " flew toronto ottawa people raved great fly porter experience im business traveler travel air
 ## [216] " ground facility toronto city airport short amazing proximity downtown core ease checkin in
 ## [217] " montreal chicago toronto porter airlines cancel flight minute regard connecting flight time
 ## [218] " day winter storm stella hit flew newark toronto island billy bishop fast offered earlier f
 ## [219] " toronto island montreal cancelled porter flight due mechanical issues quiet sunday morning s
 ## [220] " ottawa porter flight appreciated excellent onboard service baggage fees desired credit card
 ## [221] " flew porter airlines dulles montreal toronto beautiful clear sunny day half flights including
 ## [222] " misfortune flying porter airlines boston toronto times past months single flight boston port
 ## [223] " flew billy bishop ottawa back service good ways flight delayed outbound flight service goo
 ## [224] " porter idea downhill principal beef flight flexibility porter problem rescheduling cancel fl
 ## [225] " halifax johns time flying porter airlines pleasantly surprised favorite airline short distan
 ## [226] " porter airlines airlines policy late due poor weather snow storm bad halifax early december
 ## [227] " ive flying air canada work commute toronto montreal due price started porter competitive far
 ## [228] "toronto ottawa porter airlines started convenient price flying downtown toronto progressively
 ## [229] " toronto washington arrived washington immigration hour airports carousel sign checked luggage
 ## [230] " toronto dont fooled porters low prices baggage policy increases actual price ive check carry
 ## [231] " montreal halifax sunday november heard problems flights delayed price figured give confused
 ## [232] "newark montreal toronto impressed courteous service experienced airline stewardess assist old
 ## [233] " marie toronto montreal amazing service flight time cabin crew professional courteous snack
 ## [234] " delay porter cancelled midafternoon flight sunny day johns ottawa staff extremely unhelpfu
 ## [235] " august parents flew halifax toronto toronto tests assessments father prepare double lung tr
 ## [236] "toronto ottawa porter fly frequently route running average delays time convenience factor exi

[237] "toronto city newark porter fourth time flown porter trip flight delayed airline flying short :
 ## [238] "toronto newark airline distinguished customer focus things changed recently made terrible vi
 ## [239] " common complaint delays cancellations porter airlines didnt flew ottawa boston toronto billy
 ## [240] "toronto thunder porter airlines caught shuttle billy bishop airport flight caught shuttle tim
 ## [241] "hopeless customer service notifications flight cancellations delays gave ticket montreal newa
 ## [242] "flew porter airlines time granddaughter toronto ottawa extremely impressed services seats com
 ## [243] "toronto porter airlines great service prompt timing extremely practical staff helpful airport
 ## [244] "trip fine arrival customs chicago midway porter tiny customs area stuck mins long queue waitin
 ## [245] " missed porter airlines flight pay plane delay minutes late pay porter late cares"
 ## [246] " flight experience porter airlines toronto chicago disaster scheduled fly toronto chicago wed
 ## [247] " jobs required lot travel dont compare dont flying tend avoid flights connections porter airl
 ## [248] "planned vacation montreal weekend sitting porter lounge told plane mins late half hour announ
 ## [249] "porter cancels flights reason emailed minute notifying flight cancelled booked flights months
 ## [250] " flown porter december found website easy december found prices reasonable booked late death :
 ## [251] " cancelled flight hour due made wait hours flight wait listed made flight paid tickets penali
 ## [252] " small airline waits connecting passengers planes delayed bus ive late coming late hours fligh
 ## [253] " big supporter porter hours challenged loyalty airline flight newark cancelled bad weather res
 ## [254] "terrible arrived toronto island billy bishop online find flight halifax delayed hoping move f
 ## [255] "flew toronto newark christmas holidays booked flight weeks cheapest price time flights time al
 ## [256] " flown porter couple times havent issues today options arrived toronto island airport today pr
 ## [257] "flight monday outbound cancelled due mechanical reasons notified cancellation taxi half airp
 ## [258] "newark sudbury toronto give porter airlines rating nice planes great staff lounges wonderful :
 ## [259] " fly airline time quick weekend trip montreal chicago outbound trip saturday fine return trip
 ## [260] " disappointed porter days trips toronto sudbury delayed delayed spent day airport thunder to
 ## [261] " flight toronto conference chicago cancelled reason provided hours prior flight option porter
 ## [262] " awful great easy year half unreliable monthly flights toronto montreal vice versa time fail
 ## [263] " recommend porter airlines someplace time depending schedule experience delays delays problem
 ## [264] " family forward flying porter years feel chance significant issue flight yesterday august fli
 ## [265] " flight porter cancelled due engine problems rescheduled hours passengers put pm flight left
 ## [266] "flew toronto city airport washington dulles service ground good attention paid wheelchair use
 ## [267] "flew ottawahalifax return flight halifax time return slightly delayed crews extremely friendl
 ## [268] " june porter delayed return flight toronto ottawa minutes explanation porter staff billy bish
 ## [269] " hours home newark experienced delayed departure hours due computer problem toronto apparently
 ## [270] " reading previous comments torontonewark link appears real problem caught computer chaos sunda
 ## [271] " arrived late international flight made porter close flight asked bumped flight long day arr
 ## [272] "toronto island chicago midway great airport good free shuttle bus union station downtown airp
 ## [273] " family vermont holiday flight burlington great airport toronto great free drinks wide aisles
 ## [274] " time porter couldnt hype flew oneway fare excellent service underwhelming interior planes c
 ## [275] "newark toronto flight scheduled depart newark pm delayed hours boarding taxied runway minutes
 ## [276] " flight toronto beach satisfactory return flight story minutes boarding announcement passeng
 ## [277] " flown porter toronto newark times year past years fail delay cancellation return flight nigh
 ## [278] " time porter high expectation disappointed level ground service delays check hour information
 ## [279] " days delays cancellations rebooking repeated cancellations porter agent split young daughter
 ## [280] "flew round trip toronto quebec city leg excellent ontime nice staff return flight cancelled d
 ## [281] "january flight newark toronto scheduled pm delayed arrive hamilton buses wait toronto accommo
 ## [282] "halifax marie ontario bad weather conditions delayed hrs miss connecting flight helpful emp
 ## [283] " nice sunny day posted minute delay flight washington usa hour make connecting flight iceland
 ## [284] " return porter airlines people love hate love side equation passengers complimentary al
 ## [285] " toronto ottawa porter airlines airlines count delayed single time fly completely unaccept
 ## [286] "absolutely horrible experience days family friend back sunday communication passengers sat wa
 ## [287] " flying porter years friendly service nicely turned cabin crew human approach air travel flew
 ## [288] "im blind flying toronto thunder friday december needed stopped hours access washroom announ
 ## [289] "flight return june airline make feel human stress free check drive terminal tickets bought s
 ## [290] " porter round trip wife young boys forgot lunch bag baby bottles initial flight crew found lo

```
#plotting using wordcloud in reviews
# Generating a word cloud based on the words extracted from airline reviews. The term "flight" emerges ;
set.seed(1234)
wordcloud(words = wordCorpus$content, min.freq = 1,
          max.words = 200, random.order = FALSE, rot.per = 0.50,
          color = brewer.pal(9, "Set1"))
```

```
## Warning in tm_map.SimpleCorpus(corpus, function(x) tm::removeWords(x,
## tm::stopwords())): transformation drops documents
```



#SENTIMENT ANALYSIS

```
reviewP <- data.frame(text = sapply(wordCorpus$content, as.character), stringsAsFactors = FALSE)
```

```
write.csv(reviewP, file = "CleanedreviewDataset.csv", row.names = FALSE)
```

```
# get sentiment scores
```

```
reviewSentiment <- get_sentiment(reviewP$text)
```

```
reviews <- cbind(reviewP, reviewSentiment)
```

```
encodeSentiment <- function(x) {  
  if (x <= -0.5) {  
    "1) very negative"  
  } else if (x > -0.5 & x < 0) {  
    "2) negative"  
  } else if (x > 0 & x < 0.5) {  
    "4) positive"  
  } else if (x >= 0.5) {  
    "5) very positive"  
  } else {  
    "3) neutral"  
  }  
}
```

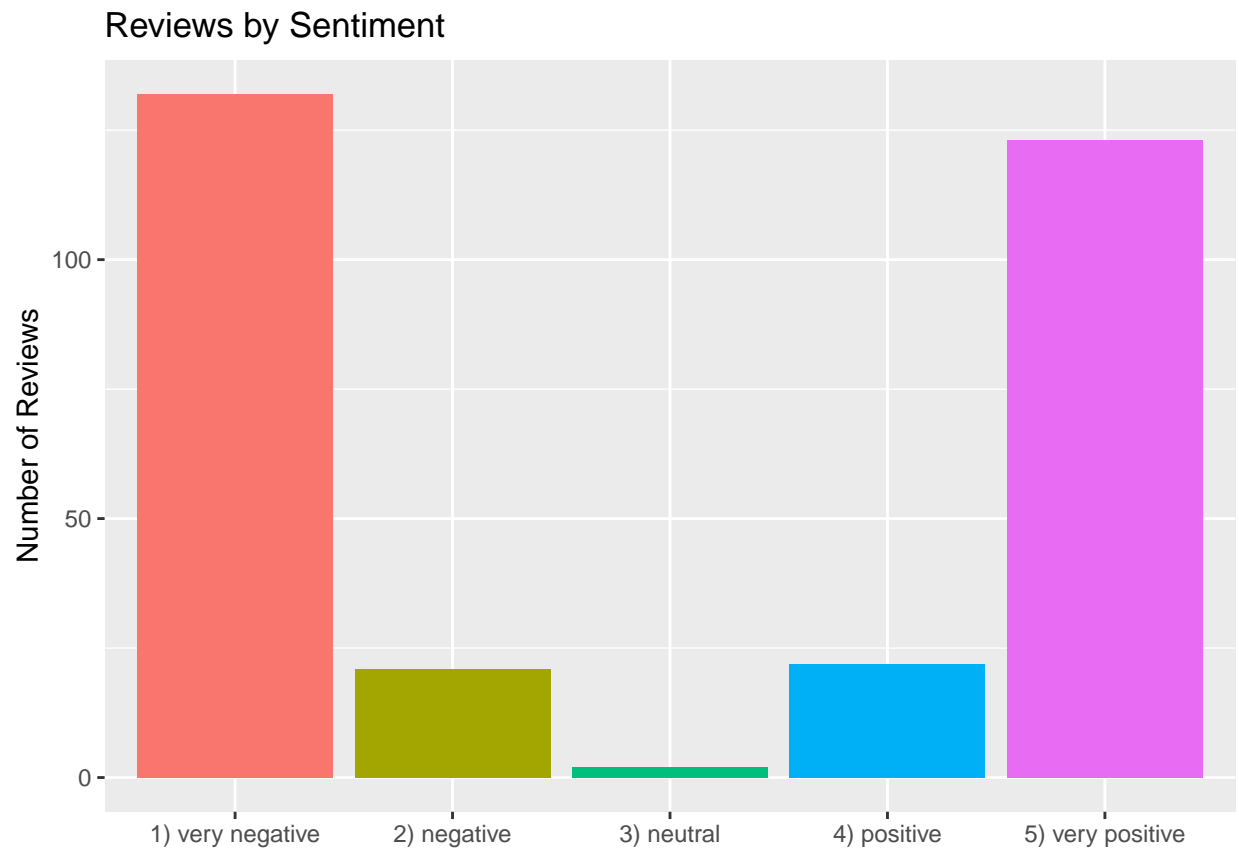
```
#sentiment scores
```

```
reviews$reviewSentiment <- sapply(reviews$reviewSentiment, encodeSentiment)
```

```
# Data visualization
```

```
#In the bar plot, we observe that the distribution of sentiment scores is skewed towards the extremes.
```

```
ggplot(reviews, aes(reviews$reviewSentiment, fill = reviews$reviewSentiment)) +  
  geom_bar() +  
  theme(legend.position = "none", axis.title.x = element_blank()) +  
  ylab("Number of Reviews") +  
  ggtitle("Reviews by Sentiment")
```



```
count_sentiment <- reviews %>%  
  count(reviewSentiment)
```

```
count_sentiment
```

```
##   reviews$reviewSentiment    n  
## 1      1) very negative 132  
## 2      2) negative    21  
## 3      3) neutral      2  
## 4      4) positive    22  
## 5      5) very positive 123
```