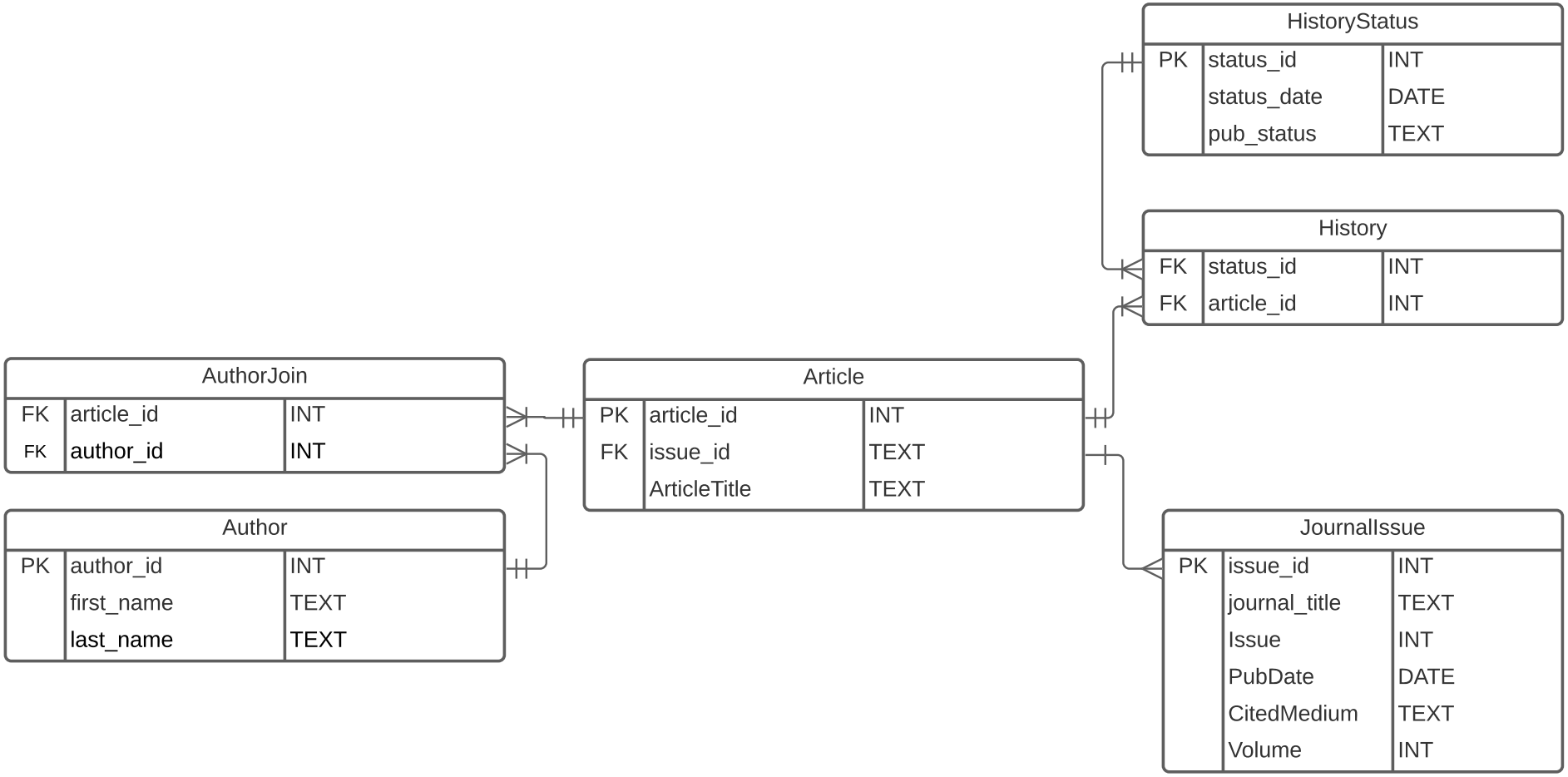
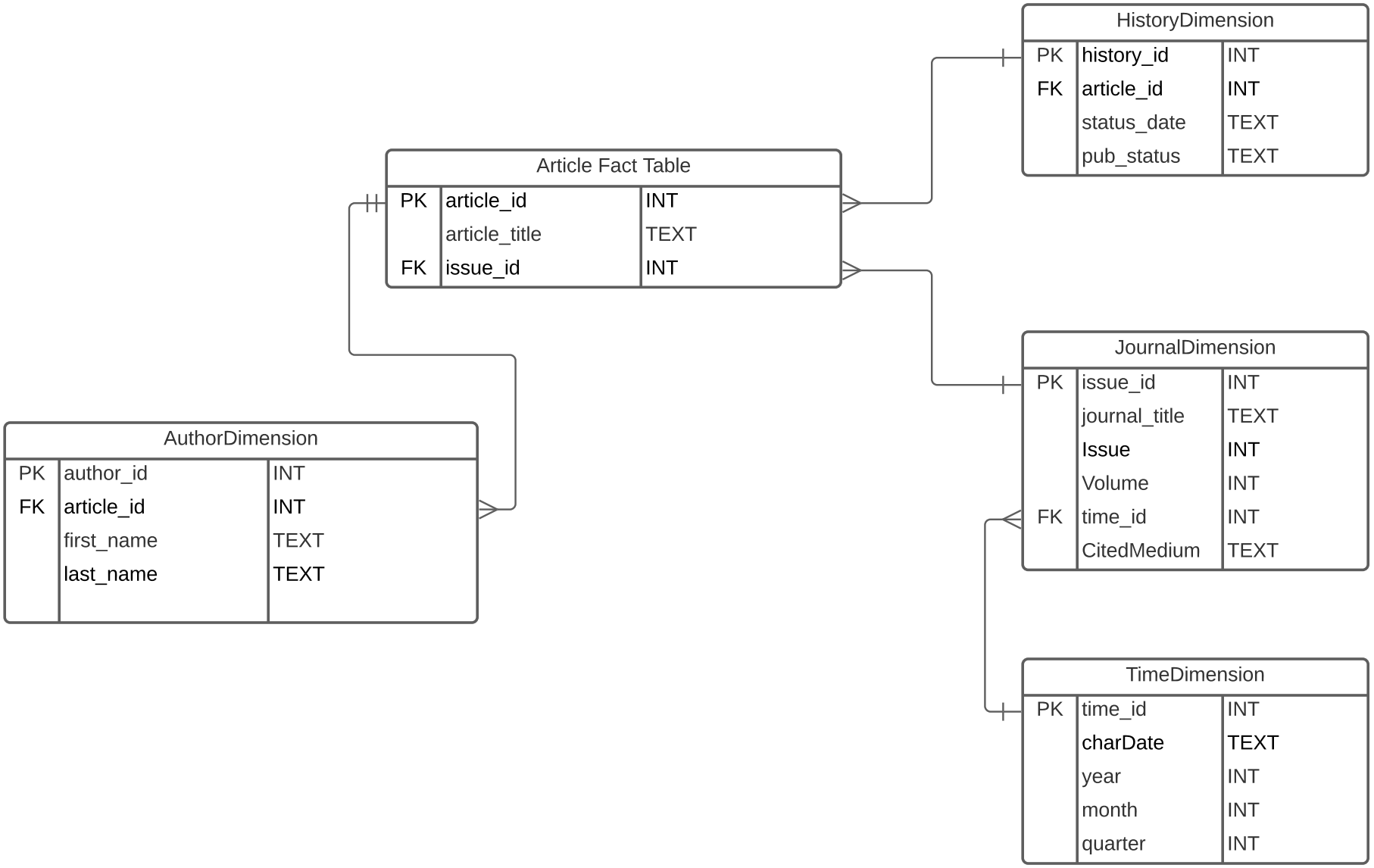
Group: Jordan Harrop,
Robert Passas

Normalized ERD;
Part 1 Question 1



Group: Jordan Harrop,
Robert Passas

Snowflake ERD;
Part 2 Question 2



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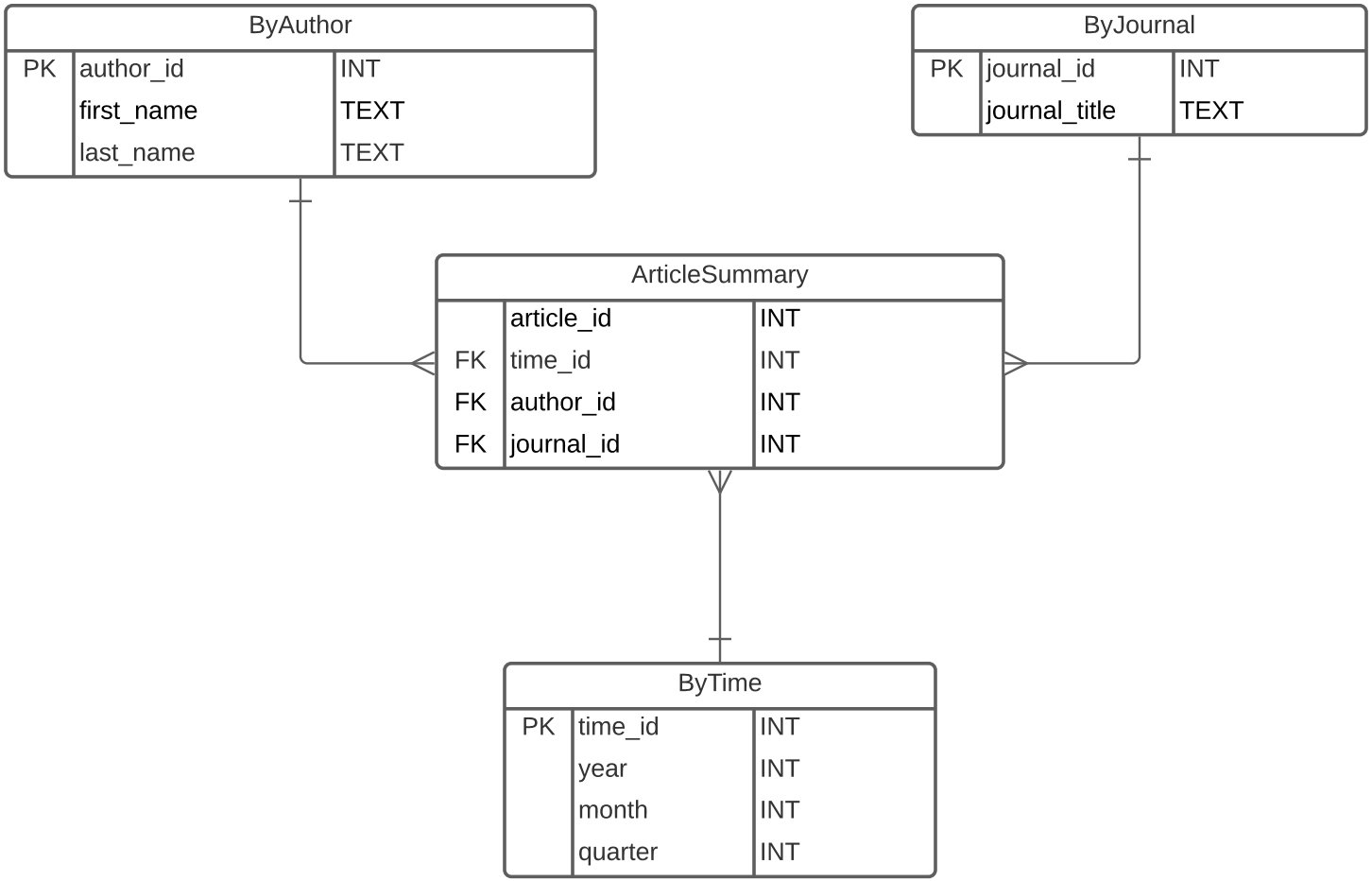
Robert Passas

Summary Table ERD;
Part 2 Question 2



PubmedDB

#PubMedDB ####Jordan Harrop ####Robert Passas The following is a database created to store pubmed publication data, provided as XML data. It concludes with queries exploring publication patterns.

##Connect to the Database

```
# 1. Library
library(RMySQL)
```

```
## Loading required package: DBI
```

```
library(XML)
library(DBI)
library(knitr)
```

```
# 2. Settings (Jordan's db)
db_user <- 'cs5200practicum2'
db_password <- 'tctvuje8'
db_name <- 'dbpracticum2'
db_host <- 'practicum2.cb9tzbdsyfxk.us-east-2.rds.amazonaws.com'
db_port <- 3306

# 3. Read data from db
mydb <-  dbConnect(MySQL(), user = db_user, password = db_password,
                 dbname = db_name, host = db_host, port = db_port)
```

#These are our file paths, they should be false to run

```
if(FALSE){
path <- "C:/Users/jorda/Documents/CS_Masters/CS5200_Databases/Homework/Practicum2/"
fn <- "pubmed_sample.xml"
fpn = paste0(path, fn)
}
```

#These are our file paths, they should be false to run

```
path <-"/Users/robert/Documents/CS5200/Practicum2/"
fn <- "pubmed_sample.xml"
fpn = paste0(path, fn)
```

```
# Reading the XML file and parse into DOM
xmlDOM <- xmlParse(file = fpn)

# get the root node of the DOM tree
r <- xmlRoot(xmlDOM)
```

###PART 1; Question 2 ##Define the Tables and Data Frames that will hold XML

```
CREATE TABLE IF NOT EXISTS Author (
  author_id INT NOT NULL PRIMARY KEY,
  first_name TEXT NOT NULL,
  last_name TEXT NOT NULL
```

```
);
```

```
Author.df <- data.frame (author_id = integer(),
                         first_name = character(),
                         last_name = character(),
                         stringsAsFactors = F)
```

```
CREATE TABLE IF NOT EXISTS HistoryStatus (
  status_id INT NOT NULL PRIMARY KEY,
  pub_status TEXT NOT NULL,
  status_date DATE NOT NULL
);
```

```
HistoryStatus.df <- data.frame (status_id = integer(),
                         pub_status = character(),
                         status_date = character(),
                         stringsAsFactors = F)
```

```
CREATE TABLE IF NOT EXISTS JournalIssue (
  issue_id INT PRIMARY KEY,
  journal_title VARCHAR(200) NOT NULL,
  cited_medium TEXT NOT NULL,
  volume INT NOT NULL,
  issue INT NOT NULL,
  pub_date DATE NOT NULL,
  FOREIGN KEY (journal_id) REFERENCES Journal(journal_id)
  ON DELETE CASCADE
);
```

```
Issue.df <- data.frame (pub_id = integer(),
                        journal_title = character(),
                         cited_medium = character(),
                         volume = integer(),
                         issue = integer(),
                         pub_date_year = integer(),
                         pub_date_month = character(),
                         stringsAsFactors = F)
```

```
CREATE TABLE IF NOT EXISTS Article (
  article_id INT NOT NULL PRIMARY KEY,
  issue_id INT NOT NULL,
  article_title TEXT NOT NULL,
  FOREIGN KEY (issue_id) REFERENCES JournalIssue(issue_id)
  ON DELETE CASCADE
);
```

```
numArticles <- xmlSize(r)

Article.df <- data.frame (article_id = integer(),
                         issue_id = integer(),
                         article_title = character(),
                         stringsAsFactors = F)
```

```
CREATE TABLE IF NOT EXISTS AuthorJoin (
  author_id INT NOT NULL,
```

```
  article_id INT NOT NULL,
  FOREIGN KEY (author_id) REFERENCES Author(author_id)
  ON DELETE CASCADE,
  FOREIGN KEY (article_id) REFERENCES Article(article_id)
  ON DELETE CASCADE,
  PRIMARY KEY (author_id, article_id)
);
```

```
AuthorJoin.df <- data.frame (author_id = integer(),
                             article_id = integer(),
                             stringsAsFactors = F)
```

```
CREATE TABLE IF NOT EXISTS History (
  status_id INT NOT NULL,
  article_id INT NOT NULL,
  FOREIGN KEY (status_id) REFERENCES HistoryStatus(status_id)
  ON DELETE CASCADE,
  FOREIGN KEY (article_id) REFERENCES Article(article_id)
  ON DELETE CASCADE,
  PRIMARY KEY (status_id, article_id)
);
```

```
History.df <- data.frame (status_id = integer(),
                          article_id = integer(),
                          stringsAsFactors = F)
```

###PART 1; Question 3 ###Parse functions to get XML data into Data Frames

```
parseAuthors <- function (anAuthorListNode)
{
  newAuthor.df <- data.frame (author_id = integer(),
                              first_name = character(),
                              last_name = character(),
                              stringsAsFactors = F)
  n <- xmlSize(anAuthorListNode)

  for (m in 1:n)
  {
    anAuthor <- anAuthorListNode[[m]]
    first_name <- xmlValue(anAuthor[[2]])
    last_name <- xmlValue(anAuthor[[1]])

    newAuthor.df[m,2] <- first_name
    newAuthor.df[m,3] <- last_name

  }

  return(newAuthor.df)
}
```

```
parseIssues <- function (anArticle)
{
  newIssue.df <- Issue.df <- data.frame (issue_id = integer(),
                           journal_title = character(),
                             cited_medium = character(),
```

```
                          volume = integer(),
                          issue = integer(),
                          pub_date_year = integer(),
                          pub_date_month = character(),
                          stringsAsFactors = F)

  #Getting Cited Medium
  CMexp <-"string(./MedlineCitation/Article/Journal/JournalIssue/@CitedMedium)"
  tempCM <- xpathSApply(anArticle,CMexp)
  cited_medium <- tempCM

  #Getting Volume
  volexp <-"./MedlineCitation/Article/Journal/JournalIssue/Volume"
  tempVolume <- xpathSApply(anArticle,volexp)
  volume <- xmlValue(tempVolume)
  #volume <- strtoi(volume)

  # #Getting Issue
  issueexp <-"./MedlineCitation/Article/Journal/JournalIssue/Issue"
  tempIssue <- xpathSApply(anArticle,issueexp)
  issue <- xmlValue(tempIssue)
  #issue <- strtoi(issue)

  #Getting Title
  titleeexp <-"./MedlineCitation/Article/Journal/Title"
  tempTitle <- xpathSApply(anArticle,titleeexp)
  title <- xmlValue(tempTitle)

  #Getting PubDate information
  pubdateexp <- "./MedlineCitation/Article/Journal/JournalIssue/PubDate"
  tempPubDate <- xpathSApply(anArticle,pubdateexp)
  singlenode <- tempPubDate[[1]]
  childnodes <- xmlChildren(singlenode)

  year <- xmlValue(childnodes[1])
  month <- xmlValue(childnodes[2])

  newIssue.df[1,2] <- journal_title
  newIssue.df[1,3] <- cited_medium
  newIssue.df[1,4] <- volume
  newIssue.df[1,5] <- issue
  newIssue.df[1,6] <- year
  newIssue.df[1,7] <- month

  return(newIssue.df)
}
```

```
parseHistoryStatus <- function (aHistoryNode, i)
{
  #newHistory.df[m,2] <- i

  n <- xmlSize(aHistoryNode)

  newHistoryStatus.df <- data.frame (status_id = integer(),
```

```
                      pub_status = character(),
                      status_date = character(),
                      stringsAsFactors = F)

  for (m in 1:n)
  {
    aDateNode <- aHistoryNode[[m]]

    dateNodeAttributes <- xmlAttrs(aDateNode)
    pub_status <- as.character(dateNodeAttributes[1])

    hisYear <- as.character(xmlValue(aDateNode[[1]]))
    hisMonth <- as.character(xmlValue(aDateNode[[2]]))
    hisDay <- as.character(xmlValue(aDateNode[[3]]))

    hisDate <- paste(hisDay, hisMonth, hisYear, sep = "-")
    historystatusrow <- nrow(HistoryStatus.df) + 1

    newHistoryStatus.df[m,2] <- pub_status
    newHistoryStatus.df[m,3] <- hisDate

  }
  return(newHistoryStatus.df)
}
```

#Parsing the articles

```
r <- xmlRoot(xmlDOM)
#Iterate through the number of articles
for (i in 1:numArticles) #should be numArticles not 3
{
  #Get the next article node
  anArticle <- r[[i]]

  #Parse Author information, returns a data frame of the authors of an individual article
  authorNode <-"./MedlineCitation/Article/AuthorList/Author"
  xauth <- xpathSApply(anArticle,authorNode)
  newAuthor.df <- parseAuthors(xauth)

  #Adding the Authors to the Author.df
  tempAuthors <- Author.df
  Author.df <- rbind(tempAuthors, newAuthor.df)

  #get the title for later
  journalTitleNode <-"./MedlineCitation/Article/Journal/Title"
  tempTitle <- xpathSApply(anArticle,journalTitleNode)
  journal_title <- xmlValue(tempTitle)

  #Parse the issue node
  newIssue.df <- parseIssues(anArticle)

  #Adding the issues to the issue.df
  tempIssue <-Issue.df
  Issue.df <- rbind(tempIssue,newIssue.df)
```

```
  #Parse History Status
  historyStatusNode <-"./PubmedData/History/PubMedPubDate"
  xhistorystatus <- xpathSApply(anArticle,historyStatusNode)
  newHistoryStatus.df <- parseHistoryStatus(xhistorystatus, i)

  #Adding the Hisotry Status to the historystatus.df
  tempHistoryStatus <-HistoryStatus.df
  HistoryStatus.df <- rbind(tempHistoryStatus,newHistoryStatus.df)

  #Getting article title Node
  titleNode <-"./MedlineCitation/Article/ArticleTitle"
  xtitle <- xpathSApply(anArticle,titleNode)
  artTitle <- as.character(xmlValue(xtitle[1]))

  #Adding article title and article_id to data frame
  Article.df[i,3] <- artTitle
  Article.df[i,1] <- i
}

#Delete Issue Duplicates
duplicateIssues <- Issue.df
Issue.df <- duplicateIssues[!duplicated(duplicateIssues),]

#Delete Author Duplicates
duplicateAuthors <- Author.df
Author.df <- duplicateAuthors[!duplicated(duplicateAuthors),]

#Delete History Duplicates
duplicateHistory <- History.df
History.df <- duplicateHistory[!duplicated(duplicateHistory),]

#Delete HistoryStatus Duplicates
duplicateHistoryStatus <- HistoryStatus.df
HistoryStatus.df <- duplicateHistoryStatus[!duplicated(duplicateHistoryStatus),]
```

###Clean the Data Frames #Here we add ID's, change date formats, and make sure data matches across data frames.

```
num.authors <- nrow(Author.df)

for (r in 1:num.authors){
  Author.df$author_id[r] <- r
}
```

```
num.historystatus <- nrow(HistoryStatus.df)

for (r in 1:num.historystatus){
  HistoryStatus.df$status_id[r] <- r
}
```

```
num.issue <- nrow(Issue.df)

for (r in 1:num.issue){
  Issue.df$issue_id[r] <- r
```

```
}
# make columns int
cols.num <- c("volume","issue")
Issue.df[cols.num] <- sapply(Issue.df[cols.num],as.integer)
sapply(Issue.df, class)
```

```
##       issue_id  journal_title   cited_medium         volume          issue
##      "integer"    "character"    "character"      "integer"      "integer"
##  pub_date_year pub_date_month
##    "character"    "character"
```

```
# years vector
year <- c()
for (r in 1:num.issue){
  year <- c(year, substr(Issue.df$pub_date_year[r],1,4))
}

#mont vector
month <- c()
for (r in 1:num.issue){
  if(is.na(Issue.df$pub_date_month[r])){
    m <- substr(Issue.df$pub_date_year[r],6,8)
  }else{
    m <- Issue.df$pub_date_month[r]
  }
  # month to numbers
  if(m == 'Jan'){
    m <- "1"
  }else if( m == 'Feb'){
    m <- "2"
  }else if( m == 'Mar'){
    m <- "3"
  }else if( m == 'Apr'){
    m <- "4"
  }else if( m == 'May'){
    m <- "5"
  }else if( m == 'Jun'){
    m <- "6"
  }else if( m == 'Jul'){
    m <- "7"
  }else if( m == 'Aug'){
    m <- "8"
  }else if( m == 'Sep'){
    m <- "9"
  }else if( m == 'Oct'){
    m <- "10"
  }else if( m == 'Nov'){
    m <- "11"
  }else if( m == 'Dec'){
    m <- "12"
  }else{
    m <- "1"
  }
  month <- c(month, m)
```

```
}



Issue.df$pub_date <- NA

for(i in 1:num.issue){
  d <- paste(year[i], month[i], sep="-")
  d <- paste(d, "-01", sep="")
  Issue.df$pub_date[i] <- d
}

Issue.df$pub_date <- as.Date(Issue.df$pub_date,
                             format = "%Y-%m-%d")
```

```
Issue.df$pub_date_month <- NULL
Issue.df$pub_date_year <- NULL
print(Issue.df)
```

```
##    issue_id
## 1         1
## 2         2
## 3         3
## 4         4
## 5         5
## 6         6
## 7         7
## 8         8
## 9         9
## 10       10
## 11       11
## 12       12
## 13       13
## 14       14
## 15       15
## 16       16
## 17       17
## 18       18
## 19       19
##                                                                  journal_title
## 1  HSS journal : the musculoskeletal journal of Hospital for Special Surgery
## 2                                                                Psychosomatics
## 3                                  Stroke; a journal of cerebral circulation
## 4                                      Regional anesthesia and pain medicine
## 5                   Seizure : the journal of the British Epilepsy Association
## 6                                  Clinical orthopaedics and related research
## 7                                              The Journal of arthroplasty
## 8                                                          Anesthesiology
## 9                                                       Pediatric radiology
## 10                                          Diseases of the colon and rectum
## 11                                            Journal of clinical anesthesia
## 12                                                                    PloS one
## 13                                      Regional anesthesia and pain medicine
## 14                                             The Journal of arthroplasty
```

```
## 15                                                                    Spine
## 16                                                                   Cancer
## 17                                                          BJU international
## 18                                       Journal of intensive care medicine
## 19                                                                    Spine
##    cited_medium volume issue   pub_date
## 1         Print      8     2 2012-07-01
## 2      Internet     54     2 2013-03-01
## 3      Internet     43    11 2012-11-01
## 4      Internet     37     6 2012-11-01
## 5      Internet     22     1 2013-01-01
## 6      Internet    471     1 2013-01-01
## 7      Internet     27    10 2012-12-01
## 8      Internet    117     1 2012-07-01
## 9      Internet     42     8 2012-08-01
## 10     Internet     55     4 2012-04-01
## 11     Internet     24     2 2012-03-01
## 12     Internet      7     1 2012-01-01
## 13     Internet     37     1 2012-01-01
## 14     Internet     27     6 2012-06-01
## 15     Internet     37    11 2012-05-01
## 16     Internet    118    12 2012-06-01
## 17     Internet    109     5 2012-03-01
## 18     Internet     27     5 2012-09-01
## 19     Internet     37     3 2012-02-01
```

```
#New root
root <- xmlRoot(xmlDOM)

#go through each article
for ( i in 1:numArticles){

  #Gets an article
  anArticle <- root[[i]]

  #Getting Volume
  volexp <-"./MedlineCitation/Article/Journal/JournalIssue/Volume"
  tempVolume <- xpathSApply(anArticle,volexp)
  volume <- strtoi(xmlValue(tempVolume))

  #Getting Issue
  issueexp <-"./MedlineCitation/Article/Journal/JournalIssue/Issue"
  tempIssue <- xpathSApply(anArticle,issueexp)
  issue <- strtoi(xmlValue(tempIssue))

  #Getting Title
  titleeexp <-"./MedlineCitation/Article/Journal/Title"
  tempTitle <- xpathSApply(anArticle,titleeexp)
  title <- xmlValue(tempTitle)

  #Getting article title Node
  titleNode <-"./MedlineCitation/Article/ArticleTitle"
  xtitle <- xpathSApply(anArticle,titleNode)
  artTitle <- as.character(xmlValue(xtitle[1]))
```

```
  #Where article title corresponds to issue, volume, and journal add an id
  for(i in 1:nrow(Article.df)){
    if(Article.df$article_title[i] == artTitle){
      for(j in 1:nrow(Issue.df)){
        if(Issue.df$journal_title[j] == title && Issue.df$issue[j] == issue
           && Issue.df$volume[j] == volume ){
          Article.df$issue_id[i] = Issue.df$issue_id[j]
        }
      }
    }
  }

}
```

```
#New root
root <- xmlRoot(xmlDOM)

#go through each article
for ( i in 1:numArticles){

  #Gets an article
  anArticle <- root[[i]]

  #Parse Author list node
  authorNode <-"./MedlineCitation/Article/AuthorList/Author"
  xauth <- xpathApply(anArticle,authorNode)

  #size of authorlist
  n <- xmlSize(xauth)

  #finds the first name/last name of each author
  for (m in 1:n)
  {
    anAuthor <- xauth[[m]]
    first_name <- xmlValue(anAuthor[[2]])
    last_name <- xmlValue(anAuthor[[1]])

    #if the first name and last name match whats in the Author.df it adds the author_id and article_id
    for( j in 1:num.authors) {
      if (Author.df$first_name[j] == first_name && Author.df$last_name[j] == last_name) {
        val <- Author.df$author_id[j]

        authorjoinrow <- nrow(AuthorJoin.df) + 1
        AuthorJoin.df[authorjoinrow,2] <- i
        AuthorJoin.df[authorjoinrow,1] <- val
      }
    }
  }
}
```

```
#New root
root <- xmlRoot(xmlDOM)
```

```
#go through each article
for ( i in 1:numArticles){

  #Gets an article
  anArticle <- root[[i]]

  #Parse History information, returns a data frame of the history dates of an individual article
  historyNode <-"./PubmedData/History/PubMedPubDate"
  xhistory <- xpathSApply(anArticle,historyNode)

  #size of historyStatus
  n <- xmlSize(xhistory)

  #finds the first name/last name of each author
  for (m in 1:n)
  {
    aDateNode <- xhistory[[m]]

    dateNodeAttributes <- xmlAttrs(aDateNode)
    pub_status <- as.character(dateNodeAttributes[1])

    hisYear <- as.character(xmlValue(aDateNode[[1]]))
    hisMonth <- as.character(xmlValue(aDateNode[[2]]))
    hisDay <- as.character(xmlValue(aDateNode[[3]]))

    hisDate <- paste(hisDay, hisMonth, hisYear, sep = "-")

    #if the first name and last name match whats in the Author.df it adds the author_id and article_id
    for( j in 1:num.historystatus) {
      if (HistoryStatus.df$pub_status[j] == pub_status && HistoryStatus.df$status_date[j] == hisDate) {
        val <- HistoryStatus.df$status_id[j]

        historystatusjoinrow <- nrow(History.df) + 1
        History.df[historystatusjoinrow,1] <- val
        History.df[historystatusjoinrow,2] <- i
      }
    }
  }
}
```

```
head(Article.df, 5)
```

```
##   article_id issue_id
## 1          1        1
## 2          2        2
## 3          3        3
## 4          4        4
## 5          5        5
##
## 1                                  Regional anesthesia for children undergoing orthopedic ambulatory
## 2 Demographics and perioperative outcome in patients with depression and anxiety undergoing total jo
## 3               Cerebrovascular reserve and stroke risk in patients with carotid stenosis or occlus
## 4    Comparative perioperative outcomes associated with neuraxial versus general anesthesia for simul
## 5                                  Vagus nerve stimulation vs. corpus callosotomy in the treatment o
```

```
head(AuthorJoin.df, 5)
```

```
##   author_id article_id
## 1         1          1
## 2         2          1
## 3         3          1
## 4         4          1
## 5         5          2
```

```
head(Author.df, 5)
```

```
##   author_id first_name  last_name
## 1         1     Cassie        Kuo
## 2         2     Alison    Edwards
## 3         3      Madhu   Mazumdar
## 4         4  Stavros G Memtsoudis
## 5         5    Ottokar   Stundner
```

```
head(History.df, 5)
```

```
##   status_id article_id
## 1         1          1
## 2         2          1
## 3         3          1
## 4         4          1
## 5         5          1
```

```
head(HistoryStatus.df, 5)
```

```
##   status_id pub_status status_date
## 1         1   received   15-1-2012
## 2         2   accepted   16-4-2012
## 3         3   epublish   20-6-2012
## 4         4     entrez   23-7-2013
## 5         5     pubmed   23-7-2013
```

```
head(Issue.df, 5)
```

```
##   issue_id
## 1        1
## 2        2
## 3        3
## 4        4
## 5        5
##                                                                  journal_title
## 1 HSS journal : the musculoskeletal journal of Hospital for Special Surgery
## 2                                                                Psychosomatics
## 3                                Stroke; a journal of cerebral circulation
## 4                                    Regional anesthesia and pain medicine
## 5                 Seizure : the journal of the British Epilepsy Association
##   cited_medium volume issue   pub_date
## 1        Print      8     2 2012-07-01
## 2     Internet     54     2 2013-03-01
## 3     Internet     43    11 2012-11-01
## 4     Internet     37     6 2012-11-01
## 5     Internet     22     1 2013-01-01
```

###Write data to SQL tables

```
dbWriteTable(mydb, "Article", Article.df, overwrite = T, row.names = F)
```

```
## [1] TRUE
```

```
dbWriteTable(mydb, "AuthorJoin", AuthorJoin.df, overwrite = T, row.names = F)
```

```
## [1] TRUE
```

```
dbWriteTable(mydb, "Author", Author.df, overwrite = T, row.names = F)
```

```
## [1] TRUE
```

```
dbWriteTable(mydb, "History", History.df, overwrite = T, row.names = F)
```

```
## [1] TRUE
```

```
dbWriteTable(mydb, "HistoryStatus", HistoryStatus.df, overwrite = T, row.names = F)
```

```
## [1] TRUE
```

```
dbWriteTable(mydb, "JournalIssue", Issue.df, overwrite = T, row.names = F)
```

```
## [1] TRUE
```

#Part 2, Question 1

```
SELECT * FROM Article LIMIT 5;
```

Table 1: 5 records

article_id	issue_id	article_title
1	1	Regional anesthesia for children undergoing orthopedic ambulatory surgeries in the United States, 1996-2006.
2	2	Demographics and perioperative outcome in patients with depression and anxiety undergoing total joint arthroplasty: a population-based study.
3	3	Cerebrovascular reserve and stroke risk in patients with carotid stenosis or occlusion: a systematic review and meta-analysis.
4	4	Comparative perioperative outcomes associated with neuraxial versus general anesthesia for simultaneous bilateral total knee arthroplasty.
5	5	Vagus nerve stimulation vs. corpus callosotomy in the treatment of Lennox-Gastaut syndrome: a meta-analysis.

```
SELECT * FROM AuthorJoin LIMIT 5;
```

Table 2: 5 records

author_id	article_id
1	1
2	1
3	1
4	1
5	2

```
SELECT * FROM Author LIMIT 5;
```

Table 3: 5 records

author_id	first_name	last_name
1	Cassie	Kuo
2	Alison	Edwards
3	Madhu	Mazumdar
4	Stavros G	Memtsoudis
5	Ottokar	Stundner

```
SELECT * FROM History LIMIT 5;
```

Table 4: 5 records

status_id	article_id
1	1
2	1
3	1
4	1
5	1

```
SELECT * FROM HistoryStatus LIMIT 5;
```

Table 5: 5 records

status_id	pub_status	status_date
1	received	15-1-2012
2	accepted	16-4-2012
3	epublish	20-6-2012
4	entrez	23-7-2013
5	pubmed	23-7-2013

```
SELECT * FROM JournalIssue LIMIT 5;
```

Table 6: 5 records

issue_id	journal_title	cited_medium	volume	issue	pub_date
1	HSS journal : the musculoskeletal journal of Hospital for Special Surgery	Print	8	2	2012-07-01
2	Psychosomatics	Internet	54	2	2013-03-01
3	Stroke; a journal of cerebral circulation	Internet	43	11	2012-11-01
4	Regional anesthesia and pain medicine	Internet	37	6	2012-11-01
5	Seizure : the journal of the British Epilepsy Association	Internet	22	1	2013-01-01

#Drop tables for running full file

```
DROP SCHEMA IF EXISTS starschema
DROP TABLE IF EXISTS starschema.AuthorDimension
DROP TABLE IF EXISTS starschema.JournalDimension
DROP TABLE IF EXISTS starschema.TimeDimension
DROP TABLE IF EXISTS starschema.HistoryDimension
DROP TABLE IF EXISTS starschema.ArticleFactTable
DROP TABLE IF EXISTS starschema.ArticleSummary
DROP TABLE IF EXISTS starschema.ByTime
DROP TABLE IF EXISTS starschema.ByJournal
DROP TABLE IF EXISTS starschema.ByAuthor
CREATE SCHEMA IF NOT EXISTS starschema
```

###Creates the Author dimension table

```
CREATE TABLE IF NOT EXISTS starschema.AuthorDimension
  AS SELECT Author.author_id as AuthorDim_id,
            Author.first_name,
            Author.last_name,
            Article.article_id
  FROM dbpracticum2.Author
  JOIN dbpracticum2.AuthorJoin USING(author_id)
  JOIN dbpracticum2.Article USING(article_id);
```

###Creates the Journal dimension table

```
CREATE TABLE IF NOT EXISTS starschema.JournalDimension (
    issue_id INT PRIMARY KEY,
    journal_title TEXT NOT NULL,
    issue INT NOT NULL,
    volume INT NOT NULL,
    pub_date TEXT NOT NULL,
    cited_medium TEXT NOT NULL,
    article_id INT NOT NULL
);
```

```
INSERT INTO starschema.JournalDimension (issue_id, journal_title, issue, volume, pub_date, cited_medium
SELECT JournalIssue.issue_id,
            JournalIssue.journal_title,
            JournalIssue.issue,
            JournalIssue.volume,
            JournalIssue.pub_date,
            JournalIssue.cited_medium,
            Article.article_id
  FROM dbpracticum2.JournalIssue
  JOIN dbpracticum2.Article USING(issue_id);
```

###Creates the History dimension table

```
CREATE TABLE IF NOT EXISTS starschema.HistoryDimension
  AS SELECT HistoryStatus.status_id as history_id,
```

```
            HistoryStatus.status_date,
            HistoryStatus.pub_status,
            Article.article_id
  FROM dbpracticum2.HistoryStatus
  JOIN dbpracticum2.History USING(status_id)
  JOIN dbpracticum2.Article USING(article_id);
```

###creates the fact table

```
CREATE TABLE IF NOT EXISTS starschema.ArticleFactTable (
  article_id INT NOT NULL PRIMARY KEY,
  article_title TEXT NOT NULL,
  issue_id INT NOT NULL
);
```

###inserts into the fact table

```
INSERT INTO starschema.ArticleFactTable(article_id, article_title, issue_id)
SELECT Article.article_id, Article.article_title, JournalIssue.issue_id
  FROM dbpracticum2.JournalIssue
  JOIN dbpracticum2.Article USING(issue_id);
```

###Creates the time dimension table

```
CREATE TABLE IF NOT EXISTS starschema.TimeDimension (
  time_id INT NOT NULL AUTO_INCREMENT PRIMARY KEY,
  charDate TEXT NOT NULL,
  year INT NOT NULL,
  month INT NOT NULL,
  quarter INT NOT NULL
);
```

###Inserts into time dimension table

```
INSERT INTO starschema.TimeDimension (charDate, year, month, quarter)
  SELECT DISTINCT pub_date as charDate,
  CAST(SUBSTRING(pub_date, 1,4) AS UNSIGNED) as year,
  CAST(SUBSTRING(pub_date, 6,2) AS UNSIGNED) as month,
  0 as quarter
  from starschema.JournalDimension;
```

###Updates quarter values for time dimension table

```
UPDATE starschema.TimeDimension SET quarter =
  CASE
    WHEN month <= 3 THEN 1
    WHEN month <= 6 THEN 2
    WHEN month <= 9 THEN 3
    ELSE 4
  END
WHERE quarter = 0;
```

###Adds time_id to journal dimension table

```
ALTER TABLE starschema.JournalDimension
  ADD time_id INT;
```

###sets the time_id from journal dimension to the time dimension equivalent

```
UPDATE starschema.JournalDimension
  SET time_id = (Select time_id from starschema.TimeDimension WHERE JournalDimension.pub_date = TimeDim
```

###Drops old pub_date column

```
ALTER TABLE starschema.JournalDimension
  DROP COLUMN pub_date;
```

```
SELECT * FROM starschema.JournalDimension
```

Table 7: Displaying records 1 - 10

issue_id	journal_title	issue	volume	cited_mediu	article_id	time_id
1	HSS journal : the musculoskeletal journal of Hospital for Special Surgery	2	8	Print	1	1
2	Psychosomatics	2	54	Internet	2	2
3	Stroke; a journal of cerebral circulation	11	43	Internet	3	3
4	Regional anesthesia and pain medicine	6	37	Internet	4	3
5	Seizure : the journal of the British Epilepsy Association	1	22	Internet	5	4
6	Clinical orthopaedics and related research	1	471	Internet	6	4
7	The Journal of arthroplasty	10	27	Internet	7	5
8	Anesthesiology	1	117	Internet	8	1
9	Pediatric radiology	8	42	Internet	9	6
10	Diseases of the colon and rectum	4	55	Internet	10	7

```
SELECT * FROM starschema.ArticleFactTable
```

Table 8: Displaying records 1 - 10

article_id	article_title	issue_id
1	Regional anesthesia for children undergoing orthopedic ambulatory surgeries in the United States, 1996-2006.	1
2	Demographics and perioperative outcome in patients with depression and anxiety undergoing total joint arthroplasty: a population-based study.	2
3	Cerebrovascular reserve and stroke risk in patients with carotid stenosis or occlusion: a systematic review and meta-analysis.	3
4	Comparative perioperative outcomes associated with neuraxial versus general anesthesia for simultaneous bilateral total knee arthroplasty.	4
5	Vagus nerve stimulation vs. corpus callosotomy in the treatment of Lennox-Gastaut syndrome: a meta-analysis.	5
6	Have bilateral total knee arthroplasties become safer? A population-based trend analysis.	6
7	The metabolic syndrome in patients undergoing knee and hip arthroplasty: trends and in-hospital outcomes in the United States.	7
8	Utilization of critical care services among patients undergoing total hip and knee arthroplasty: epidemiology and risk factors.	8
9	Visualization of the normal appendix with MR enterography in children.	9
10	FDG-PET assessment of rectal cancer response to neoadjuvant chemoradiotherapy is not associated with long-term prognosis: a prospective evaluation.	10

##Part 2, Question 2 ##Summary Fact Table

```
CREATE TABLE IF NOT EXISTS starschema.ArticlesSummary(
  article_id INT NOT NULL,
  time_id INT NOT NULL,
  journal_title TEXT NOT NULL,
  author_id INT NOT NULL
);
```

###Creates the byAuthor Table

```
CREATE TABLE IF NOT EXISTS starschema.byAuthor(
  author_id INT PRIMARY KEY,
  first_name TEXT NOT NULL,
  last_name TEXT NOT NULL
);
```

###Creates the byTime table

```
CREATE TABLE IF NOT EXISTS starschema.byTime(
  time_id INT PRIMARY KEY,
  year INT NOT NULL,
  month INT NOT NULL,
  quarter INT NOT NULL
);
```

###Creates the byJournal table

```
CREATE TABLE IF NOT EXISTS starschema.byJournal(
  journal_id INT AUTO_INCREMENT PRIMARY KEY,
  journal_title TEXT NOT NULL
);
```

###Inserts into the byJournal table

```
INSERT INTO starschema.byJournal(journal_title)
SELECT DISTINCT JournalDimension.journal_title
  FROM starschema.JournalDimension;
```

###Inserts into the byAuthor table

```
INSERT INTO starschema.byAuthor(author_id, first_name, last_name)
SELECT DISTINCT(AuthorDimension.authorDim_id) AS author_id,
AuthorDimension.first_name AS author_first,
AuthorDimension.last_name AS author_last
FROM starschema.AuthorDimension;
```

###Inserts into the byTime table

```
INSERT INTO starschema.byTime(time_id, year, month, quarter)
SELECT TimeDimension.time_id AS time_id,
TimeDimension.year AS year,
TimeDimension.month AS month,
TimeDimension.quarter AS quarter
  FROM starschema.TimeDimension;
```

```
INSERT INTO starschema.ArticlesSummary(article_id, time_id, journal_title, author_id)
SELECT starschema.ArticleFactTable.article_id,
  starschema.TimeDimension.time_id,
  starschema.JournalDimension.journal_title,
```

```
  starschema.AuthorDimension.AuthorDim_id
  FROM starschema.TimeDimension
  JOIN starschema.JournalDimension USING(time_id)
  JOIN starschema.ArticleFactTable USING(issue_id)
  JOIN starschema.AuthorDimension ON starschema.AuthorDimension.article_id = starschema.ArticleFactTable
  GROUP BY time_id, journal_title,AuthorDim_id;
```

```
select * from starschema.ArticlesSummary LIMIT 10
```

Table 9: Displaying records 1 - 10

article_id	time_id	journal_title	author_id
1	1	HSS journal : the musculoskeletal journal of Hospital for Special Surgery	1
1	1	HSS journal : the musculoskeletal journal of Hospital for Special Surgery	2
19	13	Spine	3
18	12	Journal of intensive care medicine	3
17	8	BJU international	3
16	10	Cancer	3
15	11	Spine	3
14	10	The Journal of arthroplasty	3
13	9	Regional anesthesia and pain medicine	3
12	9	PloS one	3

###Adds time_id to journal dimension table

```
ALTER TABLE starschema.ArticlesSummary
  ADD journal_id INT;
```

###sets the time_id from journal dimension to the time dimension equivalent

```
UPDATE starschema.ArticlesSummary
  SET journal_id = (Select journal_id from starschema.byJournal WHERE starschema.ArticlesSummary.journal
```

###Drops old pub_date column

```
ALTER TABLE starschema.ArticlesSummary
  DROP COLUMN journal_title;
```

###Part 3 Question 1 ##Exploring Publication patterns ###Grouping by quarter It seems that quarter 1 (jan, feb, march) is the most productive quarter.

```
select quarter, count(distinct article_id) from starschema.ArticlesSummary
  JOIN starschema.byTime USING(time_id)
  GROUP BY quarter
  order by quarter
```

Table 10: 4 records

quarter	count(distinct article_id)
1	8
2	4
3	4
4	3

###Article publication by month Let's break it down further.

```
select month, count(distinct article_id) as articles
  from starschema.ArticlesSummary
  JOIN starschema.byTime USING(time_id)
  GROUP BY month
  order by month
```

Table 11: Displaying records 1 - 10

month	articles
1	4
2	1
3	3
4	1
5	1
6	2
7	2
8	1
9	1
11	2

###Most productive year When did people publish?

```
select year, count(distinct article_id) as 'Articles_Published'
  from starschema.ArticlesSummary
  JOIN starschema.byTime USING(time_id)
  GROUP BY year
  order by Articles_Published DESC
```

Table 12: 2 records

year	Articles_Published
2012	16
2013	3

###Collaboration by quarter How many authors per article in each quarter?

```
select quarter, count(author_id)/count(distinct article_id) as collab
  from starschema.ArticlesSummary
  JOIN starschema.byTime USING(time_id)
  JOIN starschema.byAuthor USING(author_id)
  GROUP BY quarter
  order by quarter
```

Table 13: 4 records

quarter	collab
1	7.1250
2	8.0000
3	5.5000
4	8.3333

###Top 5 most published authors Who is publishing the most?

```
select first_name, last_name, count(distinct article_id) as 'Articles_Published' from starschema.Articl
  JOIN starschema.byAuthor USING(author_id)
  GROUP BY author_id
  order by Articles_Published DESC
  LIMIT 5
```

Table 14: 5 records

first_name	last_name	Articles_Published
Madhu	Mazumdar	19
Stavros G	Memtsoudis	12
Yan	Ma	7
Ya Lin	Chiu	5
Ottokar	Stundner	4

#Top 5 most published authors by quarter Let's explore top publishers.

```
select first_name, last_name, quarter, count(distinct article_id) as 'Articles_Published' from starsche
  JOIN starschema.byAuthor USING(author_id)
  JOIN starschema.byTime USING(time_id)
  GROUP BY quarter
  order by Articles_Published DESC
  LIMIT 5
```

Table 15: 4 records

first_name	last_name	quarter	Articles_Published
Madhu	Mazumdar	1	8
Madhu	Mazumdar	2	4
Cassie	Kuo	3	4
Madhu	Mazumdar	4	3

#Authors published by unique journals Who is publishing broadly?

```
select first_name, last_name, count(distinct journal_id) as 'Authors_by_Unique_Journals' from starschema
  JOIN starschema.byJournal USING(journal_id)
  JOIN starschema.byAuthor USING(author_id)
  GROUP BY author_id
  order by Authors_by_Unique_Journals DESC
  LIMIT 5
```

Table 16: 5 records

first_name	last_name	Authors_by_Unique_Journals
Madhu	Mazumdar	16
Stavros G	Memtsoudis	9
Yan	Ma	5
Ottokar	Stundner	4
Ya Lin	Chiu	4

#Journals with the most published articles Which journals are hot?

```
select journal_title, count(distinct article_id) as 'Journal_Articles_Published' from starschema.Articl
  JOIN starschema.byJournal USING(journal_id)
  GROUP BY journal_id
  order by Journal_Articles_Published DESC
  LIMIT 5
```

Table 17: 5 records

journal_title	Journal_Articles_Published
Regional anesthesia and pain medicine	2
Spine	2
The Journal of arthroplasty	2
Cancer	1
PloS one	1

```
dbDisconnect(mydb)
```

```
## [1] TRUE
```