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MAT259A  
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## Assignment 1: Data Mining & Knowledge Discovery

### Introduction

Video games emerged since the personal computer has been invented. With the advance of computer technology which brings the evolutions in computer graphics and human-computer interaction fields. Similar to film industries, video games gradually become another dominant area with the development of these technologies I just mentioned. Right now, more and more game lovers also choose to become game developers to join a game company or to put their creative ideas into their own game.

As a game lover, I would like to investigate the trend of game development in the past years based on the records provided by the Seattle Public Library. Specifically, I would like to figure out the overall popularity of the topics about game development by querying the checkout records of the game development related materials. Besides, I also would like to figure out, which material is the most popular one over years, because I personally may use that material to improve my game development skills. At last, I also want to check the trend of that media over the years. So in summary, my research will consist of three parts of the information:

- What is the overall trend/popularity of game-development topics?
- Which materials/media are the most popular ones?
- What's the change of popularity over the years?

I presented the detailed procedures to dig into my above queries in the following section.

## Details

In the first step, I tried to see the overall trend of the game-development topics. So I used the following SQL query to get the data.

### SQL Query 1

I used the following query to count the checkout records related to the game development topic, and group the records in the same year together. So that I can tell the change of popularity over the years. I sorted the resulting data based on years so that I can graph the result to see the trend easily.

```
SELECT
  YEAR(cout) AS years, COUNT(cout) AS counts
FROM
  spl_2016.outraw
WHERE
  title LIKE '%game design%' OR '%game development%'
GROUP BY years
ORDER BY years ASC
```

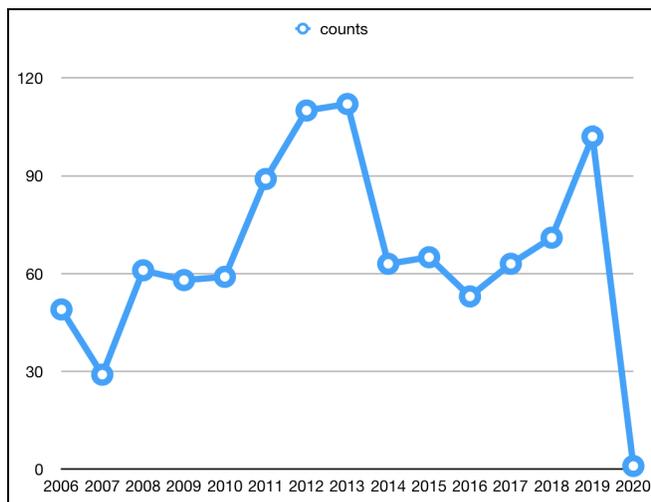
### Result 1

The query result can be found in the following table of the left, as we can see, just like what I was intending to get, the checkout times of the game-development related topics are grouped by year, and the entries are sorted based on year.

To visualize the trend, I generate the following diagram on the right. Because I don't have any experience in data visualization, I used Numbers in macOS to generate it for me.

From the diagram, we can tell that starting from 2010 the game development topics are getting more and more popular and reached a peak in 2013. Then it drops and the trend started to increase in 2016. At last, the trend drops because I did this query in Jan 2020, so the record in 2020 is anomaly data.

years	counts
2006	49
2007	29
2008	61
2009	58
2010	59
2011	89
2012	110
2013	112
2014	63
2015	65
2016	53
2017	63
2018	71
2019	102
2020	1



In the second step, I want to figure out my other query - which media is the most popular one. So I did the following SQL query.

## **SQL Query 2**

To use the following query, I tried to figure out what type of media, and which media patrons prefer to borrow. Because as we can see the record in 2020 has no value at this time, so I just filtered it out using YEAR(cout) < 2020. To figure out which one is the most popular one over the years, I tried to sort the result in descending order based on the checkout times.

```
SELECT
    title, itemType, COUNT(cout) AS counts
FROM
    spl_2016.outraw
WHERE
    (title LIKE '%game design%' OR '%game development%')
    AND (YEAR(cout) >= 2006)
    AND (YEAR(cout) < 2020)
GROUP BY title, itemType
ORDER BY counts DESC
```

## **Result 2**

From the result, we can tell the most famous one is a book (based on the itemType “acbk”) called “art of game design a book of lenses”. So I think it’s probably a good choice for my personal use if I want to learn game development.

title	itemType	counts
art of game design a book of lenses	acbk	291
Game design workshop a playcentric approach to creating innovative games	acbk	138
Drawing basics and video game art classic to cutting edge art techniques for winning video ga...	acbk	90
Chris Crawford on game design	acbk	68
Game mechanics advanced game design	acbk	52
Virtual apprentice Computer game designer	acbk	45
Careers in focus Computer video game design	acbk	41
theory of fun for game design	acbk	41
Game design foundations	acbk	41
Level up the guide to great video game design	acbk	27
Nintendo video game designer Shigeru Miyamoto	jcbk	22
Video game designer	acbk	21
Kobold guide to board game design	acbk	20
Game design	jcbk	19
Making democracy fun how game design can empower citizens and transform politics	acbk	15
Game graphics the best new video board game design	acbk	13
Swipe this the guide to great touchscreen game design	acbk	13
Getting ready for a career as a video game designer	jcbk	10
ILLM Rules of play game design fundamentals	dcillb	8
ILLM Theory of fun for game design	dcillb	4
Inside electronic game design	acbk	3
ILLM Art of game design a book of lenses	dcillb	2

Next, I want to see the trend of the book “art of game design a book of lenses” to see if it’s always popular or it’s just popular in a period of time and getting less popular or getting less practical. So I did the following query.

### **SQL Query 3**

To see the trend of this book over the years, I tried to find the records that match the title and the item type and then sorted them in ascending order based on the years so that I can generate a diagram directly.

```
SELECT
    title, YEAR(cout) AS years, COUNT(cout) AS counts
FROM
    spl_2016.outraw
WHERE
    title = 'art of game design a book of lenses'
    AND itemType = 'acbK'
GROUP BY title, years
ORDER BY years ASC
```

After running this query, I got the following results.

### **Result 3**

Based on the result, we can tell the popularity did oscillate a little bit over the years, but we can tell the popularity of the book is not dead. Personally, I still think it’s a good book to read to get started with my game development journey.

title	years	counts
art of game design a book of lenses	2010	18
art of game design a book of lenses	2011	46
art of game design a book of lenses	2012	35
art of game design a book of lenses	2013	34
art of game design a book of lenses	2014	18
art of game design a book of lenses	2015	40
art of game design a book of lenses	2016	29
art of game design a book of lenses	2017	26
art of game design a book of lenses	2018	17
art of game design a book of lenses	2019	28

