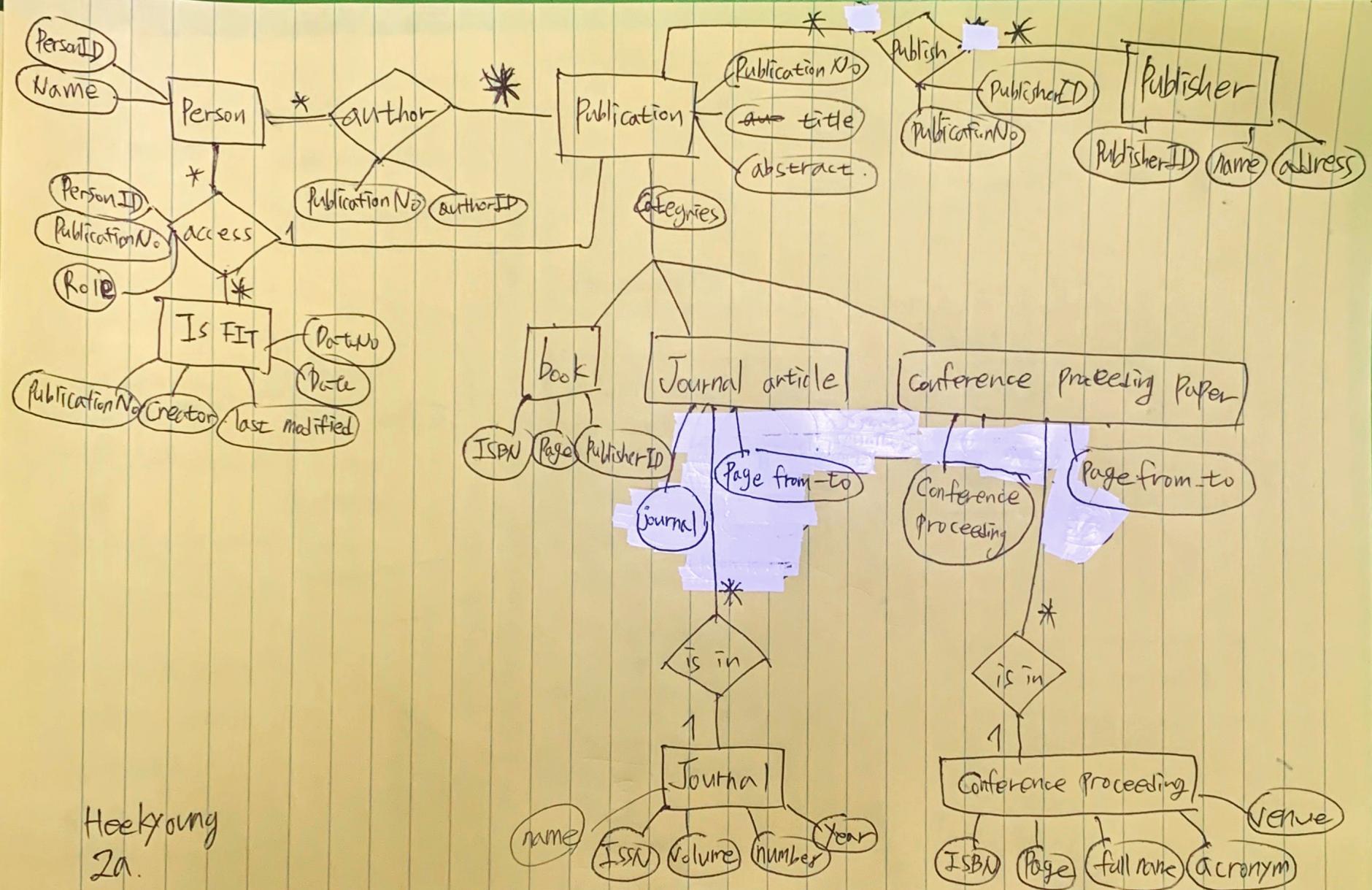


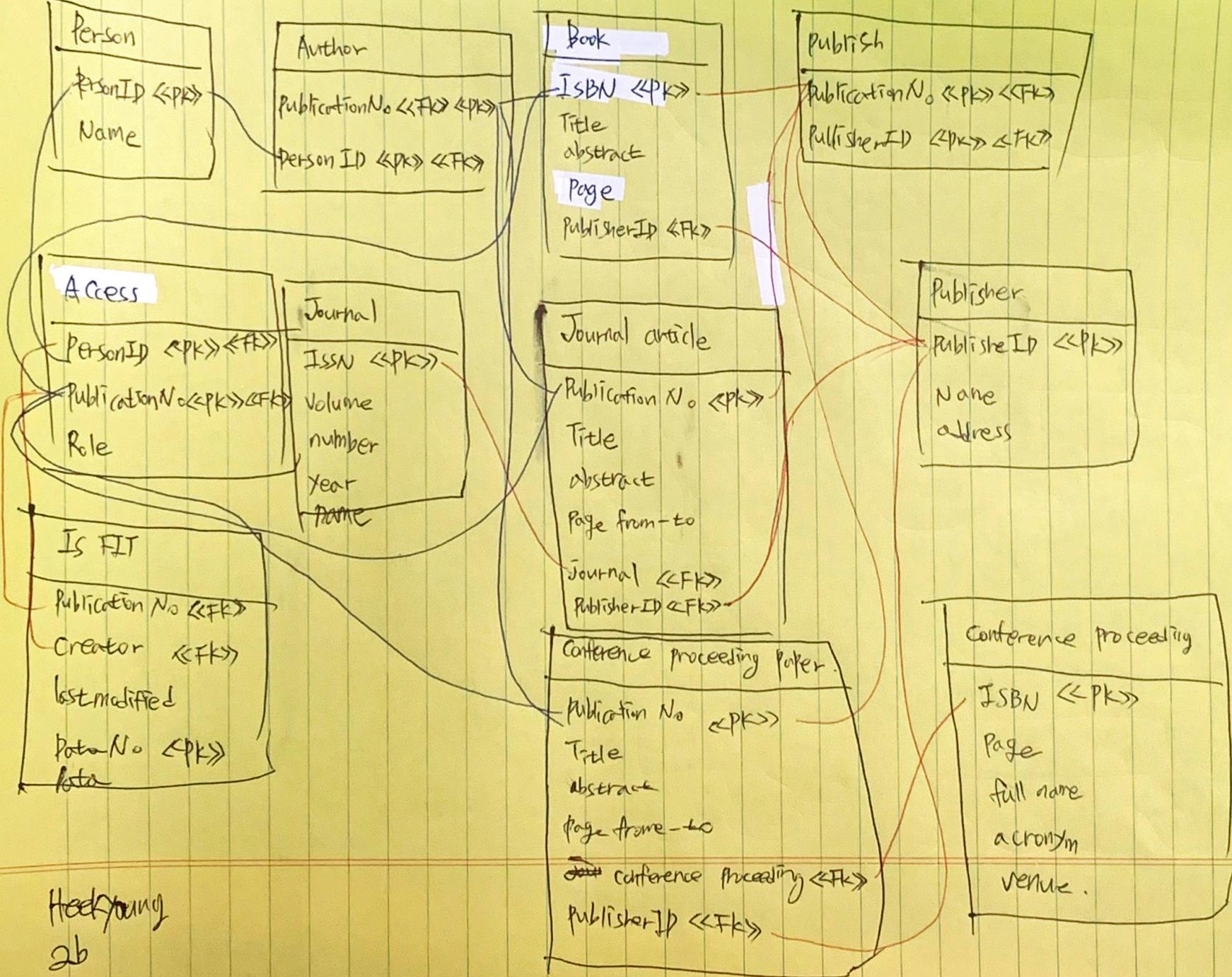
Heekyoung

- 1a. It take long time to search data we want in large database.  
We use indexing or hashing. When we want to shortening the retrieval time  
Using them, The retrieval time can be shortening
- 1b. Indexing : It grant 'Index' to column. ~~So~~ So we can use it like the  
a table of contents of a book (for example).  
Hashing : Using hash function, they change the key value to data directly

1c.



Heekyoung  
 2A.



Handwriting  
2b

2c Create view INFO-J-article (AuthorID, Title of article, ISSN, Journal Name, Publication Year) AS SELECT A.AuthorID, B.title, C.ISSN, C.name, C.year  
 FROM Author A, JournalArticle B, Journal C  
 WHERE A.publicationNo = B.publicationNo AND  
 B.Journal = C.ISSN

2d SELECT A.AuthorID, B.Name  
 FROM INFO-J-article A, Person B  
 WHERE A.AuthorID NOT IN (SELECT AuthorID  
 FROM INFO-J-article  
 WHERE Title of article = 'Computer' AND  
 publication-year = '2018')  
 AND A.AuthorID = B.Name.

2e SELECT ISSN, JournalName, MAX  
 FROM INFO-J-article  
 WHERE publication-year = '2018'  
 AND ISSN IN (SELECT ISSN, MAX(COUNT(Title\_of\_article))  
 FROM INFO-J-article  
 GROUP BY ISSN)

2f CREATE OR REPLACE TRIGGER last-modified  
 AFTER UPDATE OF Data ON IS FIT  
 BEGIN  
 UPDATE IS FIT SET last\_modified = :NEW.

Heekyoung

- 3a. Transaction is a collection of database operations required to perform one task. It is a unit of logical work. It has four properties. Atomicity, Consistency, Isolation, and Durability.

Atomicity means all-or-nothing. Operations must execute successfully. If not, any operation must not execute.

Consistency means Database should keep consistency after transaction execute.

Isolation means Other transactions cannot access to one's middle of result in concurrent transaction.

Durability means After the execute, the changes should be kept permanently without any missing.

- 3b. ~~It is~~ A database recovery is when a failure occurs, ~~it~~ Restoring the database to its pre-failure state.

During transaction, database copies the records of execute to separate location like log, dump. Using these, it can be restore the data.

- 3c Concurrent transactions are Some transactions take place simultaneously for multiple users can share database at the same time.

It can be controlled by locking protocol. There are two operation lock, unlock. They manage the accessibility to variable.

- 3d Starts with ~~lock~~, BEGIN TRAN and ends with COMMIT TRAN