

MARC, FRBR and RDA: Topic Maps Perspective

Sam Oh

JTC1 SC34 Chairman/Sungkyun University

samoh21@gmail.com

Presentation Outline

- Understanding FRBR Model
 - Functional Requirements for Bibliographic Records
- Converting MARC to FRBR
- Converting FRBR to Topic Maps
- Implementing a TM Prototype Enabling FRBR Model

FRBR 3 Groups of Entities

Group 1

- products of intellectual or artistic endeavor that are named or described in bibliographic records
 - work, expression, manifestation, item

Group 2

- entities responsible for the intellectual or artistic content, the physical production and dissemination, or the custodianship of such products
 - person, corporate body

Group 3

- entities that serve as the subjects of intellectual or artistic endeavor
 - concept, object, event, place

FRBR Group 1

Work

- A distinct intellectual or artistic creation

Expression

- The intellectual or artistic realization of a work

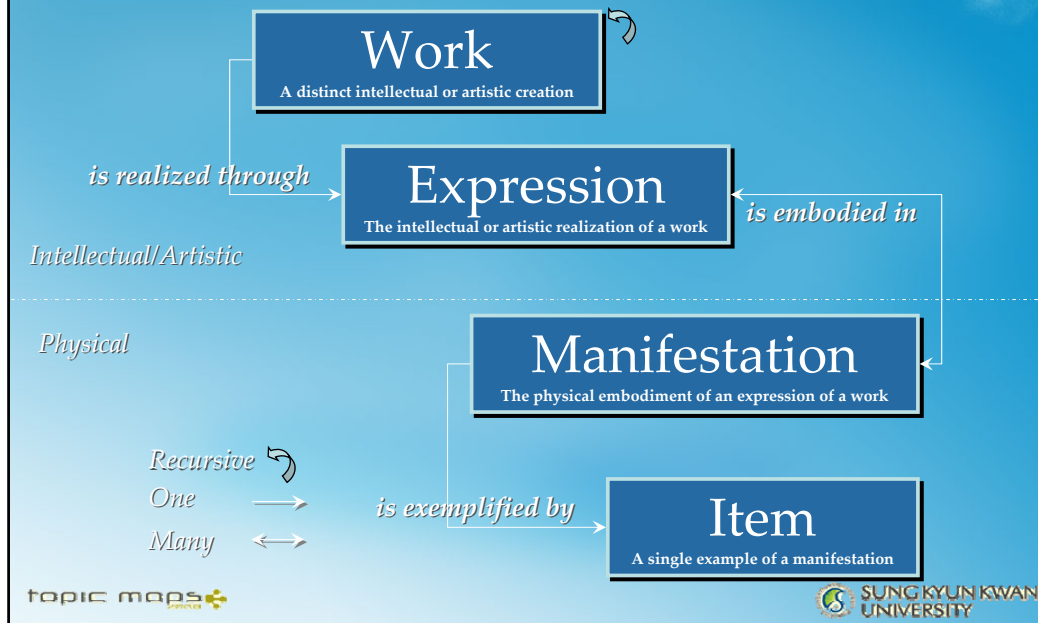
Manifestation

- The physical embodiment of an expression of a work

Item

- A single example of a manifestation

FRBR Group 1...



Group 1 Attributes

- **Work**
 - Work title, form or genre, date, performance medium, intended audience
- **Expression**
 - Expression title, form of the expression, language of the expression, type of score, scale of a map
- **Manifestation**
 - Manifestation title, publisher, date of publication, form of carrier, dimensions, manifestation identifier (e.g. ISBN), terms of availability
- **Item**
 - Location or call number, barcode, provenance, condition, access restrictions on an item

Group 2 – Responsible Entities

- Entities responsible for the intellectual or artistic content, the physical production and dissemination, or the custodianship of such products

Group 2 entities:

- Person
- Corporate Body

And perhaps a third ...

- Family

Group 2 Attributes

- Person
 - Names, dates, titles or other designations
- Corporate body
 - Name, number, place, date, other designation

Group 3 - Subject Entities

- Entities that serve as the subjects of intellectual or artistic endeavor

Group 3 entities:

- Concept: **topical subject heading**
- Object: **name for an object**
- Event: **name for an event**
- Place: **name for a place**
- Plus the Group 1 and 2 Entities:
 - Works about Works/Expressions/Manifestations/Items
 - Works about Persons and/or Corporate Entities

Relationships Between FRBR Groups

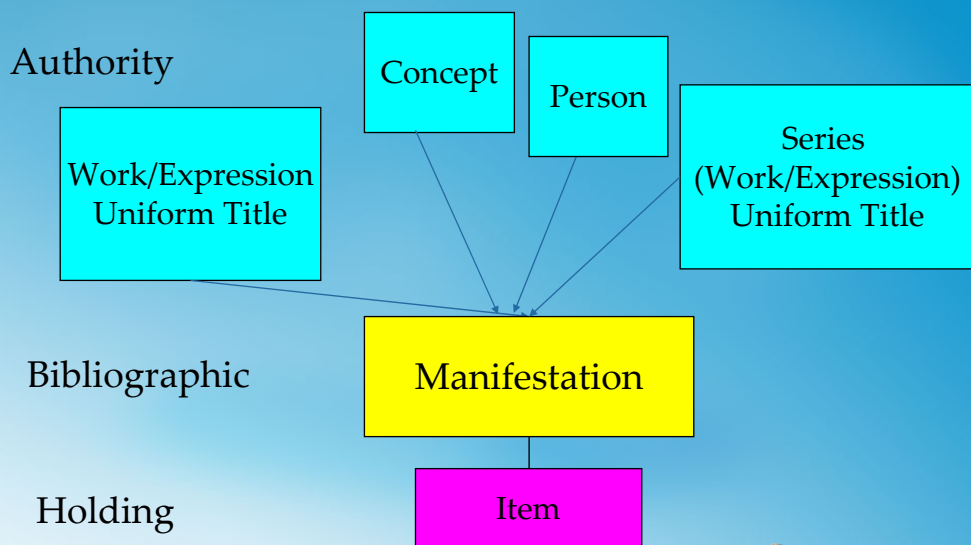
- Work \leftrightarrow Person
 - Created by
- Expression \leftrightarrow Person
 - Translated by
- Manifestation \leftrightarrow Corporate body
 - Produced by
- Item \leftrightarrow Corporate body
 - Owned by
- Concept \leftrightarrow Work
 - Is subject of

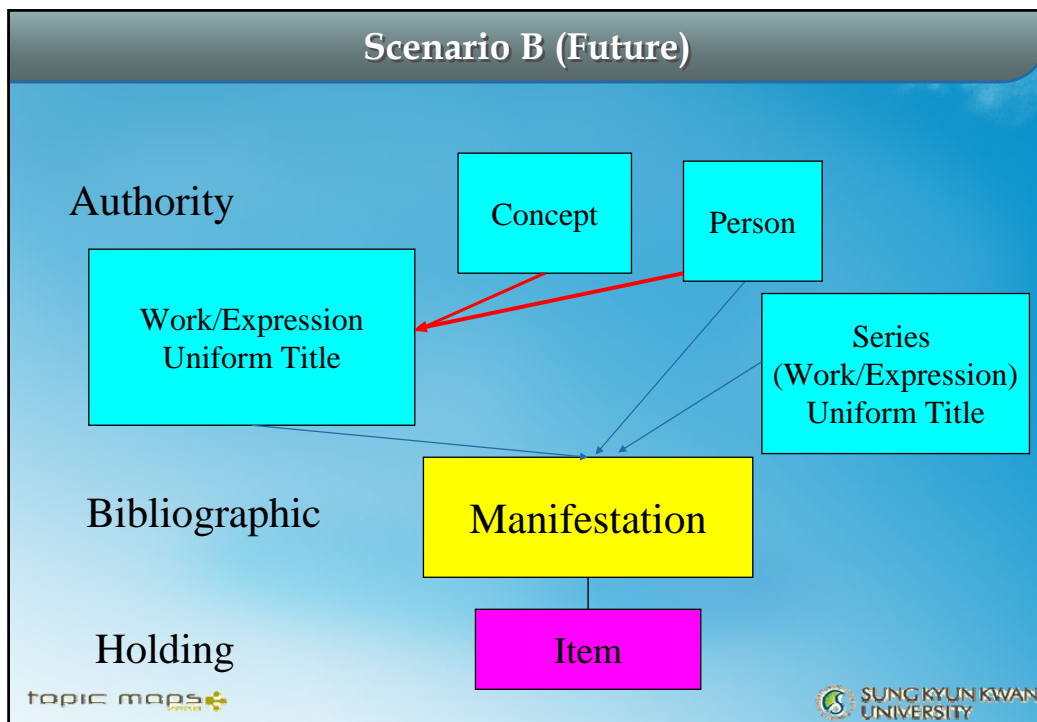
Relationships within a group

Work to work

- Successor
- Supplement
- Complement
- Summarization
- Adaptation
- Transformation
- Imitation
- Whole/part

Scenario A (Now)





- ### Applying FRBR in Services
- Incorporating the concepts of the FRBR model in systems:
 - Superior presentation of search results
 - Esp. in large files – more intuitive clustering
 - May help streamline library cataloging
 - Reduces repeated keying of work-related info
 - Bibliographic & management intelligence
 - New insights into works (e.g., [OCLC's 1000 list](#))
 - Libraries can operate at workset level (e.g., ILL)
- Logos for 'topic maps' and 'SUNG KYUN KWAN UNIVERSITY' are visible in the bottom left and right corners, respectively.

Converting MARC to FRBR

Mapping Between FRBR Attributes & MARC21 Elements

Entities	Attributes	MARC21 Elements	MARC21 Description
Work	created by	100/110/111 700/710/711 \$t,\$n,\$p,\$d,\$f,\$k,\$s,\$m,\$r,\$l,\$o,\$h	person/corporate body
	Title of work	130 \$a,\$n,\$p 240/243/245 \$a,\$n,\$p	Uniform title Collective uniform title Title statement
	Date of work	130 \$d 240/243 \$d 245 \$g	Date of treaty signing
	Form of work	130 \$k 240/243/245 \$k	Form subheading
	Medium of performance	130 \$m 240/243 \$m	Medium of performance for music
	Key	130 \$r 240/243 \$r	Key of music
	Coordinates	255 \$c	Statement of coordinates

Converting MARC to FRBR

Mapping Between FRBR Attributes & MARC21 Elements

Entities	Attributes	MARC21 Elements	MARC21 Description
Expression	Form of expression	leader/06	Type of record
	Language of expression	130 \$l 240/243 \$l 008/35-37	Language of a work language
	Other distinguishing characteristic	130 \$o 240/243 \$o 245 \$s	Arranged statement for music Revision
	Type of score	254 \$a Music 008/20	Musical presentation statement Format of music
	Scale	255 \$a 034 \$b,\$c,\$h	Statement of scale

Converting MARC to FRBR

Mapping Between FRBR Attributes & MARC21 Elements

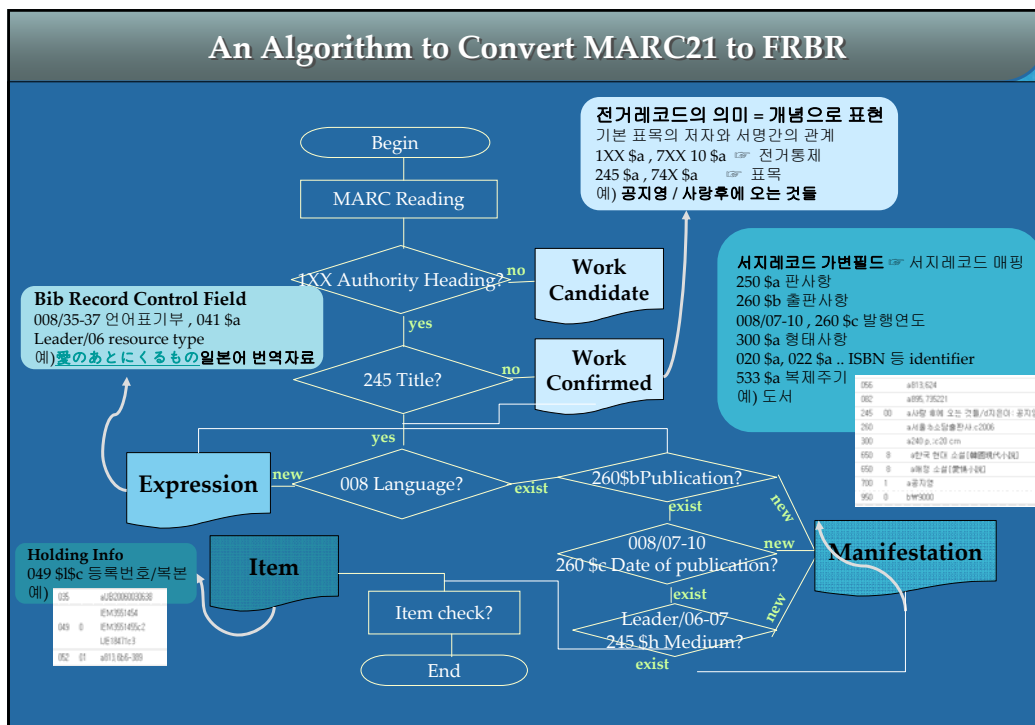
Entity	Attribute	MARC21 Elements	MARC21 Description
Manifestation	Title of manifestation	245 \$a,\$n,\$p 242 \$a,\$n,\$p	Title Number of part Name of part
	Statement of responsibility	245 \$c 242 \$c	Statement of responsibility
	Edition/issue designation	250 \$a,\$b	Edition statement Remainder of edition statement
	Numbering	362 \$a	Dates of publication and sequential designation
	Publisher/distributor	260 \$b 533 \$c	Name of publisher, distributor Agency responsible for reproduction
	Date of publication/distribution	260 \$c 533 \$d	Date of publication, distribution Date of reproduction

Converting MARC to FRBR

Mapping Between FRBR Attributes & MARC21 Elements

Entity	Attribute	MARC21 Elements	MARC21 Description
Manifestation	Form of carrier, extent of carrier	300 \$a 533 \$e	Extent Physical description of reproduction
	Dimensions of carrier	300 \$c 533 \$e	Dimensions Physical description of reproduction
	Physical medium, capture mode, playing speed, groove width, kind of cutting, tape configuration, kind of sound, special reproduction characteristics, color, polarity, presentation format, file characteristics	300 \$b	Other physical details
	Reduction ratio	340 \$f 533 \$e(?)	Production rate/ratio Physical description of reproduction
	Manifestation identifier	BK:020,027,074 SE:022,030,074 Other:024,028,074	ISBN,STRN:BK, ISSN, Coden:SE Other standard identifier, publisher number:other, Form of musical composition code:074t

An Algorithm to Convert MARC21 to FRBR



Algorithm to Convert MARC21 to FRBR

An Algorithm to Convert MARC21 to FRBR

1. Read MARC record one by one.
2. Read 1XXtag about author and apply normalization rules. (100/110/111 tag \$abcdq extract text)
3. If the author already exists in the DB, extract the title. If not, that becomes a new candidate for a new work.
4. In the 245tag \$a, extract the title and compare it to see whether it matches one of works in the DB.
 - 1) Apply normalization rules to extracted title.
 - 2) If the title in 245tag does not match, extract the text from 740tag \$a or 507tag \$t and compare it with the existing works.
 - 3) When you find a title that matches a work, extract the text in 245tag \$a as an expression of the work and move to the expression routine.
 - 4) Fix the author and title as work, then move to expression module.

Algorithm to Convert MARC21 to FRBR

☛ An Algorithm to Convert MARC21 to FRBR...

6. Check the language, 008tag / 35-37, if that is a new one, register it as a new expression.
 - If 041tag exists, separate the text from \$a and \$bch, the \$bch becomes an expression.
7. Describe expression concept as author, title, language, and type.
8. After you went through work and expression steps, check manifestation items.
 - After you extract a publisher info from 260tag \$b, apply normalization rules, then check whether it matches existing ones.
 - Extract publication date from 008tag / 07-10 and check it matches with others.
 - Treat the value of leader/06-07 as upper classification category, if 245tag \$h exists, separate resource type from it and check whether it matches with others.
9. Registration of a manifestation will be done per record and manifestation. If that is an item of manifestation, it should be excluded.
10. Extract holding information from items and register it.

Advantages of Topic Maps in Semantic Services

- ☛ Provides excellent collocation capability – Cutter's second purpose of cataloging
- ☛ TM implementation is relatively easy compared with RDF/OWL so one can expect a better return on investment.
- ☛ Excellent candidate in modeling FRBR-based data and provides great interoperability with other semantic data.
- ☛ You can easily change your ontology schema without modifying applications, which offers excellent advantage in terms of management cost.
- ☛ Provides flexible ways to model ontology.
- ☛ Provides flexible ways to convert any structure data, which makes it easy to utilize legacy data.
- ☛ Integrating TM with Web2.0 technology is easy and natural.

Refining MARC-Ontology Using Topic Maps

Topic Types

- Among FRBR entities from group 1,2,3 and MARC metadata elements, select the elements that can create “useful” collocation, assign them as topic types.
- Map FRBR model entities into MARC metadata elements and establish them as topic types.

Association Types

- Establish association types between topic types.
- Apply FRBR relationships as TM associations between topics and also establish associations between metadata elements.

Occurrence Types

- Except for MARC metadata elements that were converted as topic types, the remaining MARC elements will be defined as TM occurrence types.
- Classify occurrence types based on element values of FRBR model and assign them to appropriate topic types.
- Since MARC records are usually based on manifestation, most MARC metadata elements and other occurrence types are assigned to manifestation.

Defining Topic Types

Topic Types	FRBR Group & MARC Element
Work/Expression Manifestation/Item	FRBR Group 1, MARC Title
Person / Corporate Body	FRBR Group 2, MARC Personal name, Corporate Name
Object / Event / Place	FRBR Group 3
Country / Genre	MARC Subject (KORMARC 650tag)
Type	MARC leader's type of record (Expression Criterion)
Format	MARC Medium (245 \$h, Manifestation Criterion)
Language	MARC Language statement (Expression Criterion)
Classification	MARC KDC classification number
Context	FRBR Model (Entity Attribute)
Publisher, Date	MARC publication
Audience	MARC Target audience / User tagging info
Subject	User subject tagging info

KORMARC Elements / TM Occurrence Types

KORMARC Elements	Topic Maps Occurrence Types
Title and related fields (1XX/24X/4XX/7XX)	Other words associated with a name, Remainder of title, Parallel title, Original title, series statement, uniform title
Publication (26X)	Edition statement, Place of publication, Frequency, Regularity
Physical description (3XX)	Extent, Other physical details, Dimensions, Accompanying materials, size of unit
Note (5XX), Subject(653)	Contents note, Restrictions on access, Immediate source of acquisition, keyword
Non-book bibliographic Note(5XX)	System details note, Music format, Participant or performer note, Exhibitions note, Date/time and place of an event note, Creation/production credits note, scale note
Control field (0XX)	DDC, KDC, ISBN, Price, Korean National Library call number, identifier number, language note
Other service Note	URL, book review, status of book circulation, abstract, image of title

Occurrence Types by Topic Types

Topic Type	Occurrence Types
Work	uniform title
Expression	Original title, language note, Frequency, Regularity, Restrictions on access
Manifestation	Contents note, Immediate source of acquisition, Extent, Other physical details, Dimensions, Accompanying materials, size of unit, Edition statement, System details note, Music format, Participant or performer note, Exhibitions note, Date/time and place of an event note, Creation/production credits note, scale note, Other words associated with a name, Remainder of title, Parallel title, DDC, KDC, ISBN, Price,
Item	Korean National Library call number, identifier number
Publisher	Place of publication,
Classification	KDC, DDC
인물	Dates associated with a name?
Subject	keyword

Defining Association Types I

Topic Type	Association Type	Topic Type
Work	Work form	Genre
	Realized Through	Expression
	Created by	Person/ Corporate Body
	Context for	Context
	Work classified	Classification

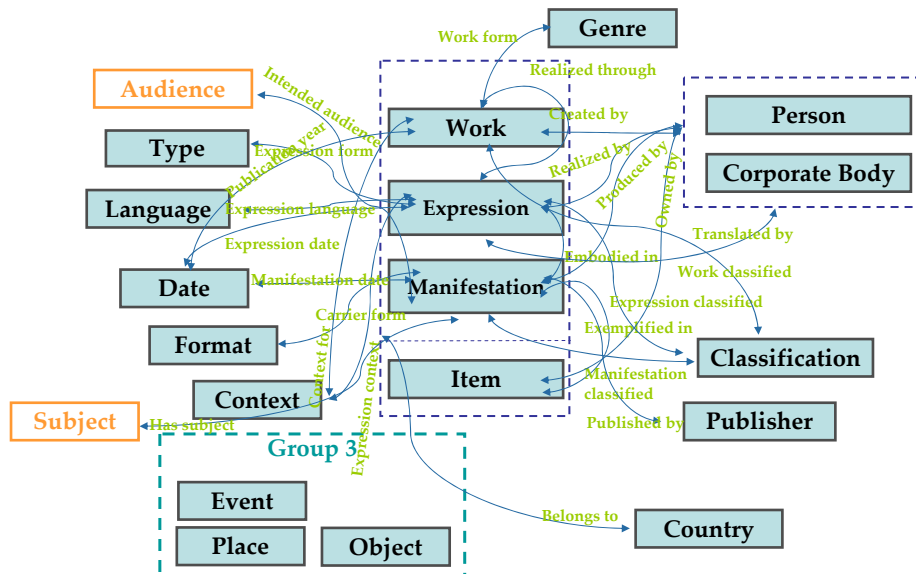
Defining Association Types II

Topic Type	Association Type	Topic Type
Expression	Embodied in	Manifestation
	Realized by	Person/ Corporate Body
	Expression form	Type
	Expression language	Language
	Expression classified	Classification
	Expression context	Context
	Expression date	Publication Date
	Translated by	Person/ Corporate Body

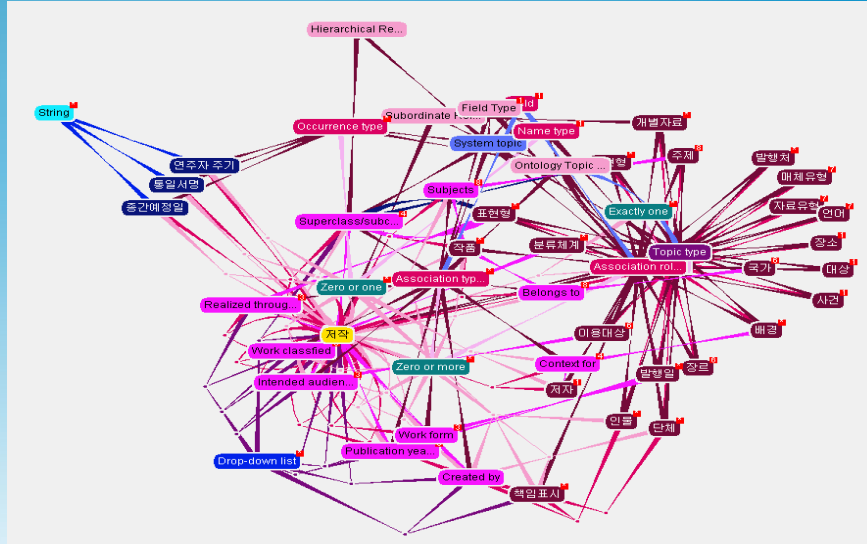
Defining Association Types III

Topic Type	Association Type	Topic Type
Manifestation	Exemplified in	Item
	Produced by	Person/ Corporate Body
	Carrier form	Format
	Published by	Publisher
	Manifestation classified	Classification
	Intended audience	Audience
	Manifestation date	Publication Date
Subject	Has subject	Work
Country	Belongs to	Expression
		Manifestation

Topic Map Modeling of FRBR



Graphical TM View of MARC



OCFL Fiction Finder

Gone with the wind.
Mitchell, Margaret, 1900-1949 **Work**

293 editions | 27 languages, held by 11291 libraries **Item**

Summary: A monumental classic considered by many to be not only the
Genres: Historical fiction | War stories | Love stories | Epic fiction
Characters: O'Hara, Scarlett (Fictitious character)
Settings: 1861 - 1865 | United States | Georgia | 1800 - 1899 | Estado Georgia —Atlanta [+]
Subjects: American Civil War, 1861-1865 | Women | Plantation life | Young women | Civil war | English language | Russian language
Audience: Kids | General | Special

LDR 00630c-am au200217 a 4500
001 0001133101▲
005 20060709122518▲
008 04011219641936nyu 000 1 eng d▲
010 ▼z 36027334 ▲
020 ▼a0025853902 ▲
040 ▼alPP▼cIPP▼dOCL▼dWSU▼dIFA▲
050 ▼aPS3625.1972 ▼bG6 1964▲
062 ▼aF▼bMIR▲
082 00 ▼aR13/.52▼zC20▲
090 ▼aA823.52▼bM694go ▲
100 1 ▼aMitchell, Margaret, 1900-1949 ▲
245 10 ▼aGone with the wind / ▼cMargaret Mitchell
260 ▼aNew York : The Modern Library, 1994. c1936. ▲
300 ▼a833 p. : ▼c22 cm. ▲
651 0 ▼aUnited States▼xHistory▼yCivil War, 1861-1865▼xFiction.▲

Editions		Genres		Characters		Settings		Subjects	
Title / Author	OCLC #	Date	Format	Aud.					
1. Gone with the wind / by Margaret Mitchell	00290058	1936	Book	General					
2. Gone with the wind	07909619	1936	Book	General					
3. Gone with the wind / by Margaret Mitchell	35240399	1964	Book	General					
4. Gone with the wind	01279858	1973	Book	General					
5. Gone with the wind / Margaret Mitchell	28491920	1936	Book	General					
6. Gone with the wind / Margaret Mitchell	25412027	1992	Large print	General					
7. Gone with the wind / Margaret Mitchell ; with a new preface by Pat Conroy and an introduction by James A. Michener	33947306	1996	Book	General					
8. Gone with the wind / Margaret Mitchell	02931402	1936	Book	General					
9. Gone with the wind. Illustrated by Ben Stahl	00878256	1961	Book	General					
10. Gone with the wind Margaret Mitchell	45950921	2001	Book	General					

NLK Prototype System: Main Screen



국립중앙도서관
THE NATIONAL LIBRARY OF KOREA

문학작품
저자
장르별
시대별



Welcome

이 prototype 프로젝트는 국중 소설 부분의 자료를 저자명, 서명, 주제별, 장르별로, 시대별로도 접근할 수 있게 도와 줍니다.
 여러 분이 찾은 작품이 더 다양한 관계 속에 있다는 것을 아실 것입니다.
 여러 분의 관심의 정도에 따라 자유롭게 탐색하시면 다른 작품도 우연히 만날 수 있습니다.
 (예: 다른 언어로, 다른 매체로)
 또 여러 분이 직접 작품의 주제를 입력하실 수도 있습니다.
 함께 만들어 가는 우리 문화의 보고입니다.

Copyright 성균관대학교 정보관리연구소





NLK Prototype System: KDC 800 Literary Works



국립중앙도서관
THE NATIONAL LIBRARY OF KOREA

문학작품
저자
장르별
시대별



문학작품의 개년 순 열람 (20)

전체 가나다라 마바사아 자차카타관하

(라디오 TV) 드라마 **연애** / 표현형 (1) / 구현형 (1) / 한국방송작가협회 편
 [문자화된 인쇄자료]
 - 라디오 TV 드라마 **연애** / [도서] / [1993] / [第三集]

(문자화된 인쇄자료)
 - 라디오 TV 드라마 **연애** / [도서] / [1990] / [第三集]

(문자화된 인쇄자료)
 - 라디오 TV 드라마 **연애** / [도서] / [1983] / [第三集]

관련항목보기

[소설 분야 작품]
 - (題詠集 大河小説) 關
 - (金高峯 長篇小説) 高峯이는 關대를 作지 不
 得다
 - (공자영 소설) 鄭들의 情狀
 - (공자영 장편소설) 鄭승이 연니
 - (공자영 장편소설) 公知안여자
 - (황백 60년동안 가장 빛나는) 남색한 尙작동
 情
 - (황백 60년동안 가장 빛나는) 남색한 尙작동
 情
 - (그 여자의) 聲
 1 2 3 4 5 6 7 8 9

[현대시 분야 작품]
 - (84 再臨) 申詩詩: 田에 오는 영혼의 聲
 - (101 萬의 亂) 亂: 亂의 聲
 - (1 만聲 萬事) 萬事의 聲
 - (A) Lamp Burns Low

[희곡 분야 작품]
 - '90 방송작가 作品選
 - '94 한국방송작가상 수상작품집
 - '94 한국방송작가상 작품집
 - '97 한국방송작가상 수상작품집

리오넬라 새색 투시에 중독되다 / 표현형 (1) / 구현형 (1) / 고연주

리얼리티무에 사시는 하느님 / 표현형 (1) / 구현형 (1) / 호종환

말발란 하우스 / 표현형 (1) / 구현형 (1) / 김경하

임세스 미립트의 가장 위대한 피라오 / 표현형 (3) / 구현형 (3) / 포이스 타

일드슬렌디

권자형선 / 표현형 (1) / 구현형 (1) / 이동수

리브 인 사이프러스 / 표현형 (2) / 구현형 (2) / 김태희

린 / 표현형 (1) / 구현형 (1) / 저자: 미상함

1 2

Work list & expression, manifestation count

Arranged by Genre





NLK Prototype System: Authors

국립중앙도서관 THE NATIONAL LIBRARY OF KOREA

문학작품 | **저자** | 장르별 | 시대별

검색 | 태그보기

장르별 저작보기

[소설 분야 연람]

- 김성호
- 김준
- 박경리
- 박완서

[현대시 분야 연람]

- 고은
- 김승호
- 김계승

[희곡 분야 연람]

- 강추자
- 우라극단 대방

저자 및 저작 리스트 (15)

관계 가 나 다 라 마 바 사 아 자 카 라 파 과 하

[다로]의 저작

- 제목: 고당덕 - 매체유형: [도서] - 발행일: 2005-2006 - 발행처: 두레미디어

[다갈 알키]의 저작

- 제목: 가리

manifestation list by authors

[달라이 라마]의 저작

- 제목: 달라이 라마의 행복론 - 매체유형: [컴퓨터파일] - 발행일: 2005 - 발행처: 한발 도시관
- 제목: 달라이 라마의 행복론 - 매체유형: [도서] - 발행일: 2001 - 발행처: 김영사
- 제목: 달라이 라마의 행복론 - 매체유형: [컴퓨터파일] - 발행일: 2005 - 발행처: 한발 도시관
- 제목: 달라이 라마의 행복론 - 매체유형: [도서] - 발행일: 2001 - 발행처: 김영사

[대니얼 김]의 저작

- 제목: 오리 - 매체유형: [도서] - 발행일: 2006 - 발행처: 동아

[대지봉준]의 저작

- 제목: 고향 - 매체유형: [도서] - 발행일: 2005-2006 - 발행처: 두레미디어

1 2 3

관련항목보기

[다른저자보기]

- 김성호
- 김준
- 박경리
- 박완서

[매체별 저작보기]

- KBS 영상사업단
- 우라극단 대방
- 영화간송공사
- 한국방송작가협회

Copyright: 성균관대학교 정보관리연구소

NLK Prototype System: Literary Works (Detail)

주제: "(문학)도지1부1"의 상세

태그 카테고리 | 태그등록

태그 카테고리

- “(문학)도지1부1”의 저작
- 박경리
- “(문학)도지1부1”의 출판사
- 나라
- “(문학)도지1부1”의 출판년도
- 2002
- “(문학)도지1부1”의 매체유형
- [도서]
- “(문학)도지1부1”의 책크기: [23cm]
- [“책크기“(0)가 “23cm”인 다른 도록]
- 90 방송작가作品集
- 94 한국방송작가상작품집
- 99 한국방송작가상 수상작품집
- 8444출판사(사)가(주)에(이)는(은) 영준의(은) 분
- 1 2 3 4 5 6 7 8 9 10
- “(문학)도지1부1”의 국문연구기호: [812.6한511.4]
- [“국문연구기호“(0)가 “812.6한511.4”인 다른 도록]
- 90 방송작가作品集
- (91 방송작가)作品集
- 1
- “(문학)도지1부1”의 페이지: [420p]
- [“페이지“(0)가 “420p”인 다른 도록]
- 90 방송작가作品集
- 次編(後編) 次編(後編) 次編(後編)
- 국회의원답게
- 한겨레(한겨레)의(은) 창조행
- 현대불교회지
- 1 2
- “(문학)도지1부1”의 가격: [6000]
- [“가격“(0)가 “6000”인 다른 도록]
- 90 방송작가作品集
- (91 방송작가)作品集
- (92 화가)사람(사람) 사람들
- (朱東潤 著)2회(회)간(간)늘새(새)와(와) 먹이(먹이)
- (康凡經先生(康凡經先生)의(은) 서(서)문(문) 代表(代表)작(작)품(品)
- 1 2 3 4 5 6 7 8 9 10
- “(문학)도지1부1”의 발행지: [서울]
- [“발행지“(0)가 “서울”인 다른 도록]

관련항목보기

[Vizigator]

Work-centered vizigator

[다른 저작]

- 90 방송작가作品集 / 한국방송작가협회 편
- 94 한국방송작가상 수상작품집 / 한국방송작가협회 편
- 94 한국방송작가상작품집 / 한국방송작가협회 편
- 99 한국방송작가상 수상작품집 / 한국방송작가협회 편
- (次編(後編) 次編(後編) 次編(後編) / 李仁壽

1 2 3 4 5 6

[다른 연람 보기]

- A. J. Cronin
- A. J. Cronin
- Davidson, Alice Joyce
- EB&S 교육방송 제작
- F. 슈본
- Göran, Kahlil
- KBS 미디어
- KBS 미디어 [제작]
- 韓國(韓國)방송(방송)사(사)가(가)의(의) 3(3)사(사)보(보)보(보)서(서)
- [靑(靑)綠(綠)回(回)訪(訪)人(人)會(會) 編(編) 3

1 2 3 4 5 6

[다른 발행처 보기]

- 도서출판영원원
- (주)문학과 지성사
- (주)문학과 지성사
- (주)문학과 지성사
- (주)문학과 지성사
- (주)문학과 지성사

1 2 3 4 5 6 7 8 9 10

NLK Prototype System: Genre

The screenshot displays the NLK Prototype System interface for the 'Genre' section. At the top, there are navigation tabs for '문학작품' (Literature Works), '저자' (Author), '장르별' (By Genre), and '시대별' (By Period). Below the navigation is a search bar and a list of search results. The main content area is divided into several sections:

- 문학작품의 장르 (69):** A section titled 'Genre (topic type)' with a list of genres and a pagination bar.
- 문학작품:** A section listing various literary works, including titles like '문학사상' and '문학이론', with their respective authors and genres.
- 관련항목보기:** A section titled 'Literature subject work list' showing related works and authors, such as '문학사상' and '문학이론'.

The interface is in Korean and features a search bar, navigation tabs, and a list of search results with pagination. Logos for 'topic maps' and 'SUNG KYUN KWAN UNIVERSITY' are visible at the bottom.

The Role of Topic Maps in Digital Libraries

