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Facet Classification in Online Retrieval

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The study of faceted classification systems has primarily been directed towards application for precombined catalogues or bibliographies, not so much for use in postcoordinated retrieval systems. In this paper it is argued that faceted classification systems in some respect are superior to other techniques of online retrieval as far as facet and concept analysis is combined with an expressive notational system in order to guide a form of retrieval which will use Boolean operators (for combining the facets regardless of one special citation order) and truncation for retrieving hierarchically different sets of documents. This point of view is demonstrated by two examples, the first one uses a short classification system derived from B.Buchanan the second is built upon the classification system used by *Library and Information Science Abstracts (LISA)*. Further discussion is concerned with some possible consequences which could be derived from a retrieval with PRECIS strings.
(Author)

1. Introduction

Developments of facet classifications have so far mainly been marked by the creation of classification systems that permit the differentiated expression of document contents in an artificial character system (document-specific synthesizations after a previous analysis according to preassigned categories), followed by the ordering of these contents in a linear sequence (bibliographies, catalogs, book arrangements)[1]. Less attention has been given so far to the possibilities and advantages, if any, of using facet classifications in online retrieval. This question will therefore be examined in the present contribution: after a general preparation, a first part will present a demonstration example, a second part will discuss the retrieval possibilities according to notations of the classification system used by *Library and Information Science Abstracts* (LISA), while a concluding part shows possible consequences for a retrieval with PRECIS strings.

2. Processing of Synthesized Notations for Retrieval Purposes

Much specific information is encoded in the synthesized notation which a facet classification assigns to a given document. This makes it desirable that this information should be capable of also being searched for in differentiated fashion, hence in particular that one should have direct access to secondary facet contents rather than only to the notations as a whole. This aspect finds its reflection in the development of *chain indexing* as a special indexing procedure for gaining access to the contents of the secondary facets. A possible retrieval realization must therefore recognize the beginning of a new facet in the synthesized notation and make the facet components thus identified available, e.g. for postcoordinated Boolean combining. This does not exclude the use of further retrieval aids, such as adjacency functions or proximity operators, but this matter will not be considered further in the following. They might be used for achieving further retrieval refinements to be derived from the application of the given citation order. Neither will those advantages be further considered here which are otherwise normally discussed in connection with the use of classification systems in online retrieval, such as the cutting-out of thematic segments from a large database, or the thematic 'placing into context' of verbally represented concepts; these advantages are present also in the realm of applications discussed here.

Example:
NgDfe Synthesized notation from two arbitrary facets, each indicated by a capital letter

Ng *and* **Dfe** Boolean combination for access to the components of the above notation differentiated according to facets.

If the notational system used furthermore is an expressive one, a hierarchically differentiated retrieval according to facets might be realized using various truncations or maskings[2].

Example:
N$ *and* **Df$** Boolean combination with truncation for retrieving all documents whose synthesized notations comprise components from the facets N or D, with all those notations being considered which begin with N (hence also all concepts subordinated to N) as well as all notations beginning with Df (hence also all concepts subordinated to Df).

One would regard it as a simplification for the user of such a system if the posing of a search question would not require the input of the given notation but if, instead, a verbal access possibility would be available.

A system resembling the one described here - without, however, using a facet classification - is available in the form of the ETHICS system[3]. This system bases the search process described above on the UDC, which leads to impressive retrieval results, although always encountering limits in those cases where the preparation of the conceptual structure in the UDC does not meet the requirements that must be imposed on it in such a retrieval[4]. The use of a facet classification with its a priori more carefully worked-out conceptual structuring - in which e.g. also such composites as *insect eye* or *library automation* would be split up into their conceptual components of the given categories - would make better recombination of complex statements and thus better retrieval results seem likely here.

Before elaborating on these statements with the aid of an example we will first stipulate what kinds of questions one would ask in an online retrieval system with the aid of classificatory structures and then suggest what a realization using facet classifications might look like.

1. Questions as to complex subjects on the a posteriori document level which are encoded as synthesized notations, with each notation representing a well-defined class of concepts. (Example: The nutrition requirements of the giant panda)

2. *All about*-questions, in which, besides the notation (concept) put in, also all its (hierarchically) subordinated concepts are to be taken into consideration for the hit quantity. (Examples: literature on birds of prey, both all such birds and individual species; forest animals)

3. *All about*-questions for complex subjects, i.e. combinations of several classes (concepts), including all hierarchically subordinated concepts, into a complex query. (Examples: Physiology of birds of prey; Physiology of land predators; Nervous systems of bone fish; Tropical freshwater animals)

4. Questions in which only the put-in search term itself, and not the relating thereof to other concepts, leads to a hit.

Precombined classification systems with no possibility of synthesization from individual (elementary) components are not suited for answering questions of the first type. To be retrievable, complex subjects must be contained in the system as classes; it is therefore a matter of chance whether, with respect to a specific document, such a class is present or not. Subject not mapped in the primary order of the classificatory structure cannot, as a general rule, be specifically and comprehensively addressed, nor is any procedure comparable to chain indexing available, while customary procedures for index preparation cannot make up for this[5]. Neither document-specific or co-extensive indexing, nor, therefore, querying, can be performed in this way. The second type of questions can be answered with precombined classification systems if they have an expressive notational system and if their conceptual structure is based on clear criteria rather than on associative structures. Since precombined classification systems frequently try to subordinate complex subjects, this conceptual 'purity' is not always sufficiently guaranteed[6]. Questions of the third type require, for being answered, postcoordinating linkages and truncation possibilities. The fourth type of questions touches on a basic problem of all Boolean online linkages which cannot be solved exclusively through structural measures in the classification system but rather requires the retrieval component to possess specific properties lest together with a component of the search field all more comprehensive entries are found as well.

Facet classifications analyze the complex subject contained in the documents according to the categorial denominations preassigned by the facets, and they synthesize correspondingly complex notations from simple building stones, namely the classes contained in the facets. Thus, if one succeeds in re-identifying the facets contained in the synthesized notations and in having access, through truncation, to the conceptual hierarchy, the first three questions mentioned above may be handled through Boolean linkages. The handling of the fourth question requires access to the complex notation as search unit.

3. Discussion of an Example

The preceding considerations will now be illustrated by means of a more detailed - but still overseeable - example. The starting point used here is a small facet classification that was employed by *B.Buchanan*[7]. This system was slightly expanded for the purposes envisaged here and equipped with an expressive notational system (cf.Annex 1), upon which it was used for the indexing of 300 'documents' (cf.Annex 2). With the aid of the LIDOS system[8] these documents were finally made retrievable so as to be able to demonstrate the various search possibilities. In so doing, the classification system was administered in the thesaurus component of LIDOS, while the notations were agreed to be synonyms for the class designations, which at the same time permits verbal access to the notations; Annex 4 shows an excerpt from the relevant structure[9]. Annex 3 shows, in excerpts, an arrangement of the documents according to the synthesized notations (in the manner of a systematically arranged bibliography), with the inverse citation order being used as filing order.

With the above we can now discuss the possibilities for the realization of the four types of questions indicated in the above.

Type 1:
Query: Nutrition requirements of the big panda
Search: Lemiaaee and Fdg
Hits: 2 (for hit list, see Fig.1)
(Boolean combination of notations from primary and secondary facets)

Type 2:
Query: Forest animals
Search: KBk$ (only in the habitat facet)
Hits: 7 (for hit list, see Fig.2)
(Truncation in a secondary facet))

Query: Tropical forst animals
Search: KBk$ and KDf$
Hits: 1 (for hit list, see Fig.3)
(Boolean combination of elements of two secondary subfacets with truncation; actually Type 3)

a) *Query*: Birds of prey
Search: Leka (only in the animal facet)
Hits: 8 (for hit list, see Fig.4)
(Access to the notation of a facet as part of a synthesized notation)

b) *Query*: Birds of prey, including all subordinated concepts
Search: Leka$ (only in the animal facet)
Hits: 16 (for hit list, see Fig.5)
(Access to the notation of a facet with truncation as part of a synthesized notation)

Type 4:
Query: Only birds of prey in general; without subordinated concepts, without relations to other aspects
Search: Leka (in the entire fields of synthesized notations)
Hits: 2 (for hit list, see Fig.6)

Type 3:
Several examples of differentiated truncation of notations in arbitrary, but firmly selected facets using Boolean combinations:
Query: Physiology of birds of prey
Search: F$ and Leka$
Hits: 5 (for hit list, see Fig.7)

Query: Physiology of birds
Search: F$ and Lek$
Hits: 6 (for hit list, see Fig.8; hit No.3 is new)

Query: Physiology of land predators
Search: F$ and Lemia$
Hits: 8 (for hit list, see Fig.9)

Query: Nervous systems of bone fish
Search: Fdd$ and Leaa$
Hits: 5 (for hit list, see Fig.18)

Query: Tropical freshwater animals
Search: KDf$ and KFaa$
Hits: 2 (for hit list, see Fig.11)

A final example may demonstrate the effect of differentiated truncating in arbitrary, but firmly determined facets:

Query: All literature on the anatomy of all vertebrates
Search: Fa and Le$
Hits: 15 (for hit list, see Fig.12)

but:

Query: General literature on the anatomy of vertebrates
Search: Fa and Le (without truncation)
Hits: 3 (for hit list, see Fig.13)

A search using the synthesized notation LeFa in the field of the complete notation would turn up none of these documents.

4. Differentiated Retrieval According to Notations in 'Library and Information Science Abstracts (LISA)'

To be able to demonstrate the considerations presented here on a real database, recourse was had to the document base of the CD-ROM edition of *Library and Information Science Abstracts (LISA)*. For classificatory description and arrangement of documents LISA uses a facet classification[10]. Unfortunately the notations of this system are not wholly expressive, so that in the following only such examples could be considered which permit truncation. Under the SilverPlatter software of the CD-ROM edition the notations are not addressible in differentiated fashion and not truncable[11]. Therefore, for this retrieval study the notation fields of the documents with a year of publication from 1986 to 1989 (totalling 16.787 documents) were made retrievable with the aid of the *askSam* Software[12].

In the following we will present, again, a few retrieval examples.

Case 1: Query object: a simple notation in the primary facet
Search: Nkz (Management by objectives)
Hits: 2 (for hit list, see Fig.14)

Search: Nk (Management techniques)
Hits: 7 (for hit list, see Fig.15)

Remark: These searches would also have been possible directly with the CD-ROM edition, but not the ones now following.

Case 2: Query object: a simple notation, not specifically in the primary facet
Search: *Nk (Management techniques, not necessarily in the primary facet)
Hits: 9 (including 2 new ones; for these, see Fig.16)

Case 3: Query object: a truncated notation in the primary facet
Search: Nk$ (all forms of Management techniques)
Hits: 44 (for an excerpt from the hit list, see Fig.17)
Remark: This type of query formulation is far more difficult to realize with verbal methods; it is particularly here that the advantage of expressive notations becomes evident.

Case 4: Query object: a truncated notation, not specifically in the primary facet
Search: *Nk$ (all forms of management techniques, not necessarily primary facet)
Hits: 106 (for an excerpt from the hit list, see Fig.18)

Remark: Of these 106 hits, 62 ones have a different notation component in the primary facet (cf. the number of hits in Case 3).
Case 5: Query represented by a Boolean combination of truncated notations.
Search: Nk$ and *Fv$ (Management techniques in the primary facet, Local authority public libraries)
Hits: 3 (for hit list, see Fig.19)

Search: *Nk$ and *Fv$ (cancellation of the restriction to the primary facet)
Hits: 4 (of which 1 is new; for hit list, see Fig.20)

A further example is given to show what use can be derived from employing truncated notations for limiting ambiguous verbal search inputs. Let the search interest pertain to the query use of CD-ROM for online catalogs, with variants such as CD-PAC also being taken into consideration. The database used for the search consisted of all LISA documents with publication year 1988 and the search fields TI, SO[13].

Search: *CD$
Hits: 167

Now let the query be directed at documents with assigned notations from the *Cataloguing* field:

Search: *CD$ and (*T$ or *U$)
Hits: 19 (for an excerpt from the hit list, see Fig.21)

If the notational component *Tog$ for *Computerized cataloguing* is used one obtains a highly precise quantity of 17 hits, avoiding the 2 documents shown in Fig.22.

In conclusion, an example will be shown for which the database consists of all documents of the LISA-CD-ROM edition.

Let the search be directed at literature on the question of online retrieval according to PRECIS data. A verbal realization of this query in the LISA-CD itself, together with the relevant document list, is shown in Fig.23. Be it remarked that the use of the search words *Retrieval* and *Online* is problematic. *PRECIS* and *retrieval* produces too many hits, *PRECIS* and *online* probably too few. With LISA notations a search might look as follows:

Search: PRECIS *and* Vr$ *or* *Zk$ *or* *Ueg$
Hits: 9 (for hit list, see Fig.24)

More precise statements on the quality of retrieval in the manner as described here and as differing from verbal retrieval possibilities should not be made yet at this point; they would require further research. Further investigations in this direction appear promising, however. One must take into account, though, that the classification system used at present by LISA does *not* possess an expressive notational system, so that the number of questions available for a retrieval study is limited.

5. Concluding Remarks and Outlook

The above remarks form a contribution to the discussions currently under way on the shape to be given to search components in online retrieval systems. The idea of seeking verbal access to the contents of the individual elements of a classificatory structure makes it appear worthwhile to pay closer attention to the ideas of faceted thesauri. It also becomes clear, on the other hand, that classificatory structures permit the answering of questions that cannot be answered by verbal methods alone, i.e. without the elaboration of conceptual networks. The concrete shaping of the access is, in the end, more in the nature of a question directed at the design of the user interface: the separation between the retrieval processes taking place in the background of the querying system and the part serving for communication with the user.

If one thinks of fully worked-out conceptual networks such as e.g. the RIN file[14] prepared with PRECIS, it appears well imaginable that the conceptual relationships contained in this file, the classificatory structure of the conceptual network, might, together with the categories contained in the PRECIS syntax, be developed into an effective retrieval system under a common user interface. Such a system would not only permit of Boolean linkages of individual descriptors, but also of retrieval strategies that might link a flexible search-down in the semantic network with specifications imposed also by syntactic categories. As an example one might mention e.g.: a search for literature on the role of a specific entity together with *all* its subordinated concepts as the object of a specific action.

Let this be demonstrated symbolically by the following case. Let the semantic network contain the following structure:

Entity
|
Subordinated concept 1
|
Subordinated concept 2

Let there furthermore be the following indexed items[15] relating to different documents:

1. (1) Object
   (2) Action
   (3) Entity

2. (1) Entity
   (2) Action
   (3) Agent

3. (1) Subordinated concept 1
   (2) Action
   (3) Agent

4. (1) Subordinated concept 2
   (2) Action
   (3) Agent

A query *Entity as the object of action* would produce Document 2 as a hit, but not Document 1. The query *Entity with all its subordinated concepts as the object of action,* on the other hand, would produce

Documents 2, 3, and 4 as hits.

This little example makes clear what possibilities of further development the applications of faceted classificatory structures presented here may have in online retrieval once the necessary preconditions in the fields of data and retrieval technology have been created.

Notes

1 A useful example for illustrating this overall application field is found in the bibliography *Library and Information Science Abstracts (LISA)*, which uses a facet classification *(A classification of library and information science, London 1971, unpublished)* for classifying the titles indicated in the various issues.

2 This aspect has already been theoretically discussed in (1) and (2)

3 Cf. the description of the system and its retrieval possibilities a.o. in the articles (3-8)

4 This aspect has been presented in more detail in (9)

5 This question is well observable in numerous pre-combined classification systems through the example *Literature*, where as a matter of principle the aspects *Language and geographical spreading, time, category or genre* compete with one another, with one aspect (frequently the language) being declared the primary aspect, while the other ones are in the end, in variable order, reduced to hierarchical subdivisions, thus precluding any direct or comprehensive access to them.

6 Cf. the description in (10).

7 For this see (11) and (12). The classification system contained in (12) has also been used in (13). The recommendations given in (13), however, could not be taken into consideration in our article.

8 See LIDOS 3 in (14)

9 The reader should not be confused by the abbreviations used by LIDOS to characterize conceptual relationships. Contrary to common usage, *VB* does not mean "Verwandte Begriffe" (Related Concepts), but rather denotes concepts having a common superordinated concept, thus indicating with respect to the latter concept all its subordinated concepts of *identical* hierarchical level.

10 See (15) as well as (16)

11 Cf. for instance (17) and (18)

12 See AskSam, described in (19)

13 The limitation to these categories resulted merely from the insertion of the 3990 documents with the year of publication 1988 from LISA into the retrieval environment of *askSam* and from the experimental retrieval study.

14 Cf. for this (20)

15 The numbers in brackets are meant to indicate the role operators used in PRECIS.

References

(1) Gödert, W.: Klassifikationssysteme und Online-Katalog. Z.Bibl.wes.u.Bibliogr.34(81987)p.185-195

(2) Gödert, W.: Online-Katalog und bibliothekarische Inhaltserschließung. In: 77.Dt.Bibliothekartag in Augsburg 1987: Reden u.Vorträge. Frankfurt: Klostermann 1988. (ZfBB Sonderh.46) p.279-302

(3) Hug, H., Nöthiger, R.: Zwei Jahre ETHICS-OPAC: Erfahrungen mit einem 'Online Public Access Catalogue'. Z.Bibl.wes.u.Bibliogr.35(1988)p.249-257

(4) Hug, H.: Bericht und Thesen zur Sacherschließung in der ETH-Bibliothek. ARBIDO-R 3(1988)p.46-47

(5) Weber, A., Nöthiger, R.: ETHICS: ETH Library Information Control System; an Online Public Access Catalogue at the ETH-Bibliothek. ABI-Techn.8(1988)p.385-387

(6) Schmidt, K., Walser, M.: ETHICS: Anleitung für die Katalogabfrage und die Ausleihe. Zürich ETH-Bibliothek 1989.

(7) Funk, H., Loth, K.: Sachabfrage im ETHICS auf der Basis der UDK: ein OPAC. In: Wissensorganisation im Wandel. Dezimalklassifikation - Thesaurusfragen - Warenklassifikation. Proc.11.Jahrestag.Ges.f.Klassif. Frankfurt: Indeks Verl.1988. p.43-47 (Studien zur Klassif.Bd.18)

(8) ETHICS: Detailanleitung zur Online Abfrage; Titelwortabfrage und Sachabfrage. Stand: 30.7.1987. Zürich: ETH-Bibliothek, p.51-53

(9) Gödert, W.: Die Dezimalklassifikation im Online-Retrieval. Nachr.Dok. 41(1990)p.155-158

(10) Gödert, W.: Klassifikatorische Inhaltserschließung: ein Übersichtsartikel als kommentierter Literaturbericht. Mitt. bl.Verb.Bibl.Land NRW 40(1990)p.95-114, esp.p.97

(11) Buchanan, B.: Theory of library classification. London 1979.

(12) Buchanan, B.: Bibliothekarische Klassifikationstheorie. Dt.Übers., München: Saur 1989.

(13) Liu, S.: Online classification notation: proposal for a faceted notation system. Int.Classif.17(1990)No.1, p.14-20

(14) LIDOS 3: Literatur-Dokumentationssystem. Oberasbach: Doris Land Softwareentwicklung 1988.

(15) A classification of library and information science. London 1971.

(16) Moore, N.L.: LISA indexing: economic aspects of controlled indexing. Indexer 16(1988)p.11-16

(17) Terbille, Ch.: LISA on CD-ROM. In: CD-ROM Librarian, Sept.1990. p.26-28

(18) Hartley, R.J.: LISA on CD-ROM: an evaluation. Online Rev.13(1989)p.53-56

(19) AskSam: Access stored knowledge via symbolic access method. Version 4.2c. AskSam Systems Inc.1989.

(20) Austin, D.: PRECIS: a manual of concept analysis and subject indexing. 2nd ed. London 1984. esp.p.198-248

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Annex 1: The Classification System

ZOOLOGY

A.FORM OF DOCUMENT
Aa..Contributions
Ab..Periodical
Ac..Monograph
Ad..Conference Report
Ae..Picture volume
Af..Maps of distribution
Ag..Lexicon, Encyclopedia
Ah..Handbook

B.ACTIONS ON/WITH ANIMALS
Ba..Collection
Bc..Kind of experiments

Bca...Observations
Bcb...Field experiments
Bcd...Laboratory experiments
Bf..Kind of identification
Bfa Determination, classification, taxonomy
Bfb...Naming, nomenclature

C.GENERAL PROCESSES, DEVELOPMENT OF THE ANIMAL KINGDOM
Ca..Individual development, growth
Cd..Theory of derivation, evolution

D.ACTIVITIES, BEHAVIOR
Da..Social behaviour
Daa...Play
Dd..Hibernation
Dg..Migration

E.ATTRIBUTES, PROPERTIES
Eb..Intelligence
Ef..Agression

F.PHYSIOLOGICAL PROCESSES, SENSE ORGANS
Fa..Anatomy
Fd..Physiology
Fda...Skin
Fdd...Nervous system
Fdda....Brain
Fddd....Senses
Fddda.....Optical senses
Fdf...Respiration/Breathing
Fdg...Eating
Fdh...Moving
Fdha....Running
Fdhb....Flying
Fdi...Reproduction

H/L.ANIMALS, FAUNA

H.BY RELATION TO HUMANS
Ha..Beneficial animals, useful animals
Hd..Harmless animals, non-dangerous
Hg..Dangerous animals
Hga...Poisonous animals

J.BY HABIT/ATTITUDE
Ja..Migrating animals
Jaa...Vagrants
Jd..Hibernating animals

KA/KF.BY LIFE AREA
KA By ground topography
KAa...River bank and coastal animals
KAaa....Coastal animals
KAd...Lowland animals
KAf...Hill, highland animals
KAm...Mountain animals

KB..By ground vegetation
KBa...Desert animals
KBd...Prairie animals
KBf...Grassland animals
KBk...Woodland/Forest animals
KBka....Djungle animals

KD..By latitude
KDa...Polar animals
KDd...Temperate zone animals
KDf...Tropical animals
KDfa....Equatorial animals

KF..By element
KFa...Aquatic/Water animals
KFaa....Freshwater animals
KFaaa.....River animals
KFaad.....Lake animals
KFad....Marine/Sea/Salt water animals
KFd...Amphibious animals
KFg...Land animals

L.ZOOLOGICAL TAXONOMY
La..Invertebrates
Laa...Arachnids
Laaa....Spiders
Lad...Insects
Lada....Lepidoptera
Ladaa.....Moths
Ladaaa.....Leaf moths
Ladad.....Butterflies
Ladd....Hymenoptera
Ladda.....Bees
Laddaa.....Honeybees
Le..Vertebrates
Lea...Fishes
Leaa....Bone fishes
Leaaa.....Genuine bone fishes
Leaaaa.....Soft finned fishes
Leaaaaa.....Herrings
Led...Amphibians
Leda....Frogs
Lede....Toads
Lef...Reptiles
Lefa....Lizards
Lefe....Snakes
Lefi....Tortoises
Lek...Birds
Leka....Raptors/Birds of prey
Lekaa.....Eagle
Lekaaa.....Golden eagle
Lem...Mammals
Lema....Rodents
Lemaa.....Rats
Lemi....Beasts of prey
Lemia.....Land beasts of prey
Lemiaa.....Dogkind land beasts of prey
Lemiaaa.....Procyomidae
Lemiaaaa.....Red Panda
Lemiaae.....Bears
Lemiaaee.....Giant Panda
Lemo....Primates
Lemoa.....Monkeys
Lemoaa.....Colobus monkeys
Lemoab.....Claw monkeys
Lemoaba.....Golden-yellow lion monkey
Lemoabb.....Dwarf silkmonkey
Lemoabc.....Whitefaced-silkmonkey
Lemob.....Man

Annex 2:
List of Document Titles

01. Poisonous snakes at the equator <LefeKDaHga>
02. Contributions on the raptors of the deserts <LekaKBaAa>
03. Endangering of toads by car drivers <Lede>
04. Congress on the economic utility of honeybees <LaddaaHaAd>
05. Guidelines for the determination of middle European river fishes <LeaKFaaaKDdBfa>
06. Rodents in field and forest <LemaKBk>
07. Moving processes of the leaf moth's flying <LadaaaFdha>
08. Who hibernates in the woods and fields? <KBkJd>
09. Adaptation of the lizard's skin to the desert climate <LefaKBaFdaCd>
10. Golden eagles in high mountain regions <LekaaaKAm>
11. Tortoises in tropical rivers <LefiKFaaaKDf>
13. Butterflies of the German middle highlands and their names <LadadKAfBfb>
14. Food requests of tropical spiders <LaaaKDfFdg>
15. Contributions on the anatomy of bone fishes <LeaaaFaAa>
16. Bears of the polar region <LemiaaeKDa>
17. Journal on the theory of evolution <CdAb>
18. Animal determination guide <BfaAc>
19. Easy finding names of birds; a guide to their determination <LekBfa>
20. Observation of monkeys playing <LemoaDaaBca>
21. Bird determination book <LekBfaAc>
22. Birds of middle Europe: a determination book LekBfaAc>
23. The social behavior of Colobus monkeys <LemoaaDa>
24. Aggression of monkeys <LemoaEf>
25. Adaptation of primates <LemoCd>
26. Special food requests of the giant panda <LemiaaeeFdg>
27. The nervous system of bears <LemiaaeFdd>
28. The reproduction of bears <LemiaaeFdi>
29. The anatomy of red pandas <LemiaaaaFa>
30. The evolution of procyomidae and bears <LemiaaaCd; LemiaaeCd>
31. The relationship of the red panda with the giant panda <Lemiaaee; Lemiaaaa>
32. Dogkind land animals of prey: a picture volume <LemiaaAe>
33. Land animals of prey of the temperate zones <LemiaKDd>
34. Polar animals: a picture volume <KDaAe>
35. Animals of prey- do they play? <LemiDaa>
36. Golden eagles and their habitat: with maps <LekaaaAf>
37. Food requests of the golden eagle <LekaaaFdg>
38. Distribution maps of rats <LemaaAf>
39. The ecological significance of rodents: a congress <LemaHAd>
40. Hibernating rodents <LemaJd>
41. Physiological processes in hibernation: a congress <FDd>
42. Social behavior of mammals <LemDa>

Annex 3:
Systematic Order of the Classed Titles

Bfa Ab
* Journal for Taxonomy (Doc.No.221)
* Taxonomy: a Journal (doc.No.158)

Bfa Ac
* Animal-Determination Book (Doc.No.018)

CdAb
* Letters on Evolution (Doc.No.157)
* Evolution: a Journal (Doc.No.156)
* Journal for Evolution (Doc.No.017)

D Ab
* Journal of Animal Behavior (Doc.No.160)

F Dd
* Physiological Processes of Hibernation: a Conference (Doc.No.041)

Fa Ab
* Journal of Physiology (Doc.No.154)

Fd Bc * Experimental Physiology: a Journal (Doc.No.161)

Fd BcAd
* Contributions on Experimental Physiology: Proceedings (Doc.No.162)

FdDd
* Physiology of Hibernation (Doc.No.216)
* Physiological Processes of Hibernation (Doc.No.104)

Fdf Dd
* The breathing in hibernation (Doc.No.005)

H/LDa
* Social behavior of animals (Doc.No.179)
* Animals and their social behavior (Doc.No.222)

Jaa
* Migrating birds (Doc.No.193)

JaaAe
* Picture volume of migrating birds (Doc.No.217)
* Migrating birds: a picture volume (Doc.No.048)

Jaa Dg Bca
* Watching migrating birds (Doc.No.049)

Jd
* Hibernation (Doc.No.203)

Jd Fdf
* The respiration of hibernating animals (Doc.No.106)

Jd Fdf Dd
* The respiration of hibernating animals in hibernation (doc.No.107)

Annex 4:
Classification System in the LIDOS Thesaurus Format

Brain
BT: Nervous system
NT:
UF: Fdda
RT: Senses

Giant panda
use *Panda*

Golden-yellow lion monkey
BT: Claw monkeys

NT:
UF: Lemoaba
RT: Dwarf silkmonkey; Whitefaced-silkmonkey

H use *By relation to humans*

H/L
use *Animals*

Ha
use *Beneficial animals*

Handbook
BT: Form of document
NT:
UF: Ah
RT: Contributions; journal: monograph, congress volume; picture volume; maps of distribution, lexicon

Insects
BT: Invertebrates
NT: Lepidoptera; Hymenoptera
UF: Lad
RT: Arachnids

Poisonous animals
BT: Dangerous animals
NT:
UF: Hga
RT:

Raptors
BT: Birds
NT: Eagle
UF: Leka
RT:

Skin
BT: Physiology
NT:
UF: Fda
RT: Nervous system; respiration; eating; moving; reproduction

Annex 5: Examples of Retrieved Document Titles

1. Special food requests of the giant panda <LemiaaeeFdg> (Doc.No.026)
2. The eating habits of pandas <LemiaaeeFdg> (Doc.No.196)

Fig.1: Title list retrieved by 'Lemiaaee and Fdg' (Food requests of the giant panda)

1. Who hibernates in forest and field? <KBkJd> (Doc.No.008)
2. Handbook on tropical forest animals <KDfKBkAh> (Doc.No.044)
3. Forest birds <LekKBk> (Doc.No.050)
4. Raptors in the forest <LekaKBk> (Doc.No.191)
5. The birds of the forest <LekKBk> (Doc.No.201)
6. Who sings in fields and forests? <LekKBfBfaAc; LekKBkBfaAc> (Doc.No.230)
7. The rodents of our home country. <LemaKBk> (Doc.No.292)

Fig.2: Title list retrieved by 'KBk$' (animals in the forest)

1. Handbook of tropical forest animals <KDfKBkAh> (Doc.No.044)

Fig.3: Title list retrieved by 'KBk$ and KDf$' (tropical forest animals)

1. Contributions on the raptors of the desert <LekaKBaAa> (Doc.No.002)
2. Determinations of birds of prey <LekaBfa> (Doc.No.047)
3. Observing the raptors' flight <LekaFdhaBca> (Doc.No.061)
4. Can one speak of an aggressiveness of raptors? <LekaEf> (Doc.No.126)
5. Birds of prey <Leka> (Doc.No.184)
6. Raptors in the forest <LekaKBk> (Doc.No.191)
7. The flight of raptors: Observations <LekaFdhaBca> (Doc.No.286)
9. Raptors <Leka> (Doc.No.288)

Fig.4: Title list retrieved by 'Leka' (raptors/birds of prey)

1. Contributions on the raptors of the desert <LekaKBaAa> (Doc.No.002)
2. Golden eagles in high mountain regions <LekaaaKAm> (Doc.No.010)
3. Golden eagles' distribution: with maps <LekaaaAf> (Doc.No.036)
4. Food requests of the golden eagle <LekaaaFdg> (Doc.No.037)
5. Eagles: a picture volume <LekaaAe> (Doc.No.046)
6. Determination of raptors: a guideline <LekaBfa> (Doc.No.047)
7. The reproduction of the golden eagle <LekaaaFdi> (Doc.No.052)
8. Observing the raptors' flight <LekaFdhaBca> (Doc.No.061)
9. Can one speak of an aggressiveness of raptors <LekaEf> (Doc.No.126)
10. Distribution map of the golden eagle <LekaaaAf> (Doc.No.145)
11. Birds of prey <Leka> (Doc.No.184)
12. Raptors in the forest <LekaKBk> (Doc.No.191)
13. The life of the golden eagle <LekaaaAe> (Doc.No.202)
14. The flight of raptors: observations <LekaFdhaBca> (Doc.No.286)
15. What is the food of the golden eagle? <LekaaaFdg> (Doc.No.287)
16. Raptors <Leka> (Doc.No.288)

Fig. 5: Title list retrieved by 'Leka$' (raptors including all narrower concepts)

1. Birds of prey <Leka> (Doc.No.184)
2. Raptors <Leka> (Doc.No.288)

Fig.6: Title list retrieved by 'Leka' as a complete notation (raptors in general; without narrower concepts, without relationships to other aspects)

1. Food requests of the golden eagle <LekaaaFdg> (Doc.No.037)
2. The reproduction of the golden eagle <LekaaaFdi> (Doc.No.052)
3. Observing the raptors' flight <LekaFdhaBca> (Doc.No.061)
4. The flight of raptors: Observations <LekaFdhaBca> (Doc.No.286)
5. What is the food of the golden eagle? <LekaaaFdg> (Doc.No.287)

Fig.7: Title list retrieved by 'F$ and Leka$' (physiology of raptors)

1. Food requests of the golden eagle <LekaaaFdg> (Doc.No.037)
2. The reproduction of the golden eagle <LekaaaFdi> (Doc.No.052)
3. The anatomy of birds: a picture volume <LekFaAe> (Doc.No.053)
4. Observing the raptors' flight <LekaFdhaBca> (Doc.No.061)
5. The flight of raptors: Observations <LekaFdhaBca> (Doc.No.286)
6. What is the food of the golden eagle? <LekaaaFdg> (Doc.No.287)

Fig.8: Title list retrieved by 'F$ and Lek$' (physiology of birds)

1. Special food requests of the giant panda <LemiaaeeFdg> (Doc.No.026)
2. The nervous system of bears <LemiaaeFdd> (Doc.No.027)
3. The reproduction of bears <LemiaaeFdi> (Doc.No.028)
4. The anatomy of procyomidae <LemiaaaaFa> (Doc.No.029)
5. Contributions to the respiration behavior of hibernating bears <LemiaaeFdfDdAa> (Doc.No.108)
6. Physiological processes of hibernating bears <LemiaaeFdDd> (Doc.No.109)
7. The eating habits of pandas <LemiaaeeFdg> (Doc.No.196)
8. Why is it that the red panda can climb so easily? <LemiaaaaFa> (Doc.No.297)

Fig.9: Title list retrieved by 'F$ and Lemia$' (physiology of land beasts of prey)

1. The senses of the herring <LeaaaaaFddd> (Doc.No.072)
2. Contributions to the nervous system of soft finned fishes <LeaaaaFddAa>
3. The structure of the eye of soft finned fishes <LeaaaaFddda> (Doc.No.077)
4. Contributions to the nervous system of bone fishes <LeaaaFddAa> (Doc.No.079)
5. The brain of bone fishes <LeaaFdda> (Doc.No.084)

Fig.10: Title list retrieved by 'Fdd$ and Leaa$' (nervous system of bone fishes)

1. Tortoises in tropical rivers <LefiKFaaaKDf> (Doc.No.012)
2. Distribution map of tropical fresh water fishes <LeaKFaaKDfAf> (Doc.No.144)

Fig.11: Title list retrieved by 'KDf$ and KFaa$' (tropical fresh water animals

1. Contributions to the anatomy of bone fishes <LeaaaFaAa> (Doc.No.015)
2. The anatomy of procyomidae <LemiaaaaFa> (Doc.No.029)
3. The anatomy of birds: a picture volume <LekFaAe> (Doc.No.053)
4. Anatomy and physiology of soft-finned fishes <LeaaaaFa; LeaaaaFd> (Doc.No.073)
5. Contributions to the anatomy of soft-finned fishes <LeaaaaFaAa> (Doc.No.074)
6. Anatomy of the genuine bone fishes <LeaaaFa> (Doc.No.078)
7. Anatomy of bone fishes <LeaaaFa> (Doc.No.083)
8. Handbook on the anatomy of vertebrates <LeFaAh> (Doc.No.099)
9. Contributions to the anatomy of vertebrates <LeFaAa> (Doc.No.141)
10. Anatomy of fishes <LeaFa> (Doc.No.233)
11. Handbook on the anatomy of vertebrates, 2nd ed. <LeFaAh> (Doc.No.267)
12. Bone fishes and their skeleton <LeaaFa> (Doc.No.275)
13. Anatomy of rodents <LemaFa> (Doc.No.293)
14. Why is it that the red panda can climb so easily <LemiaaaaFa> (Doc.No.297)
15. Anatomy of primates <LemoFa> (Doc.No.299)

Fig.12: Title list retrieved by 'Fa and Le$' (all documents on the anatomy ofvertebrates)

1. Handbook on the anatomy of vertebrates <LeFaAh> (Doc.No.099)
2. Contributions to the anatomy of vertebrates <LeFaAa> (Doc.No.141)
3. Handbook on the anatomy of vertebrates, 2nd ed. <LeFaAh> (Doc.No.267)

Fig.13: Title list retrieved by 'Fa and Le' (general literature on the anatomy of vertebrates)

```
SilverPlatter 1.6              LISA (1/69 - 9/89)

TI: Libraries and management by objectives [in Japanese] 1 of 2
AU: Mori,-Koichi
CC: Nkz  Nkz
AN: 88-5048

TI: Management by objectives and university libraries    2 of 2
AU: Lavergne,-Philippe-de
CC: NkzGd  Nkz
AN: 88-2906
```

Fig.14: Title list to search for LISA Notation 'Nkz'

```
SilverPlatter 1.6          LISA (1/69 - 9/89)

                                                              1 of 44
TI: Consulting to rural public libraries: a survey of state library agencies.
AU: Griffith-Leah-M.
CC: Nkm Nkm
AN: 89-3924
                                                              2 of 44
TI: Analysis, process and use of information 8: a view-point of a solution to a
 problem [in Japanese].
AU: Nawa-Kotaro
CC: Nk Nk
AN: 89-3437
                                                              3 of 44
TI: CPM and PERT in library management.
AU: Main-Linda
CC: Nky Nky
AN: 89-3441
                                                              4 of 44
TI: Management information in libraries: its exploitation.
AU: Redfern-Margaret
CC: Nkk Nkk
AN: 89-3439
                                                              5 of 44
TI: A management information system for the public library.
AU: Zijlstra-Paul
CC: NkkFv Nkk
AN: 89-3440
                                                              6 of 44
TI: Quality assurance in Canadian hospital libraries--the challenge of the
 eighties.
AU: Eagleton-Kathleen-M.
CC: Nk&HuD71 Nk
AN: 89-3438
                                                              7 of 44
TI: Quality assurance: establishing a program for special libraries.
AU: Fredenburg-Anne-M.
CC: Nk& Nk
AN: 89-2863
                                                              8 of 44
TI: Thinking about management: an approach to self-analysis for library
 managers.
AU: Hannabuss-Stuart
CC: Nk Nk
AN: 89-2361
                                                              9 of 44
TI: The system viewpoint and library reforms [In Chinese].
AU: Li-Chaoxian
CC: Nkv Nkv
AN: 89-1233
                                                             10 of 44
TI: Methodology work.
AU: Risko-Andrej
CC: NkmD437 Nkm
AN: 89-714
                                                             11 of 44
TI: Integrated Academic Information Management Systems (IAIMS)
AU: Matheson,-Nina-W-(ed);
 IAIMS-(Integrated-Academic-Information-Management-Systems);
 Integrated-Academic-Information-Management-Systems
CC: NkkEr(61)  Nkk
AN: 88-5759
```

Fig.17: Extract of title list to search for LISA Notation 'Nk$'

```
SilverPlatter 1.6          LISA (1/69 - 9/89)

                                                              1 of 10
TI: Integration of text, facts, graphics and pictures into a knowledge base.
AU: Scholz-Kordula
CC: ZmRnNkv Zm
AN: 89-4775
                                                              2 of 10
TI: Human centred IT.
CC: SaOqNkv Sa
AN: 89-4606
                                                              3 of 10
TI: Le Musee Documentaire: reflections on a database of works mentioned in art
 treatises and town descriptions before 1800.
AU: Schwartz-Gary
CC: ZmRnM(7(091))Nkv Zm
AN: 89-4774
                                                              4 of 10
TI: Building your own database: potentials for creativity.
AU: Horowitz-Roberta-S.; Latinwo-Larry; Weiner-John-M.
CC: ZmRnNkv Zm
AN: 89-4241
                                                              5 of 10
TI: Information behaviors in the preparation of research proposals: a user
 study.
AU: Nilan-Michael-S.; Fletcher-Patricia-T.
CC: ZmVticNkv Zm
AN: 89-4272
                                                              6 of 10
TI: The value of information: approaches in economics, accounting, and
 management science.
AU: Repo-Aatto-J.
CC: RmNko Rm
AN: 89-4006
                                                              7 of 10
TI: A generalization and clarification of the Waller-Kraft wish list.
AU: Cater-Steven-C.; Kraft-Donald-H.
CC: ZjNkv Zj
AN: 89-4133
                                                              8 of 10
TI: Composition of hypertext nodes.
AU: Garg-Pankaj-K.; Scacchi-Walt
CC: ZjOthNkv Zj
AN: 89-4143
                                                              9 of 10
TI: Systems astigmatism.
AU: McKee-Bob
CC: OqNkv Oq
AN: 89-3941
                                                             10 of 10
TI: Constructing data bases--professional issues.
AU: Moulton-Lynda-W.
CC: SaOqNkv Sa
AN: 89-3021
```

Fig.18: Title list to search for LISA Notation '*Nk$'

Fig.15 could not be included because of lacking space

Fig.16 see page 109

```
TI: CD-ROM and satellite plans in NSW TAFE library services.
AU: Woods-Lois; AUSSAT;
CLANN-(College-Libraries-Activity-Network-in-New-South-Wales)
SO: LASIE; 19 (1) July/Aug 88, 4-9. 3 refs
PY: 1988
CC[ TogOjc Tog
AN: 89-4667
--------------------------------------------------------------------------------

TI: CD-ROM and on-line public access catalogues. A project of Bielefeld
University.
AU: Binder-Wolfgang; Kemminer-Jurgen; Summan-Friedrich;
Bielefeld-University-(West-Germany).-Library
SO: ABI-Technik; 8 (2) 1988, 107-110, 113-120. illus. 16 refs
PY: 1988
CC[ TogOjcGd Tog
AN: 89-4670
--------------------------------------------------------------------------------

TI: CD-ROM in the library: it's more than the fiche of the 21th century.
AU: Pearson-Ellen-M.; MacKinnon-Ron; Guelph-University-(Ontario).-Libraries
SO:
In:-International-library-cooperation:-10th-Anniversary-Essen-Symposium,-19-Oc
ber-22-October-1987; 153-160
PY: 1988
CC[ TogOjcAx Tog
AN: 89-4669
--------------------------------------------------------------------------------

TI: Updating of online catalogue on CD-ROM?
AU: Neubauer-Karl-Wilhelm
SO:
In:-International-library-cooperation:-10th-Anniversary-Essen-Symposium,-19-Oc
ber-22-October-1987; 161-178. illus. 4 refs
PY: 1988
CC[ TogOjc Tog
AN: 89-4668
--------------------------------------------------------------------------------

TI: An example of catalogue management on CD-ROM: BIBLIOFILE.
AU: Cormouls-Martine; Gaudin-Frederique; BiblioFile
SO: Documentaliste; 25 (3) May-June 88, 122-128. tables
PY: 1988
CC[ TogOjc Tog
AN: 89-4105
--------------------------------------------------------------------------------

TI: The compact disk circulation system interface at Tacoma Public Library:
beyond stand-alone CD-ROM.
AU: Hegarty-Kevin; Tacoma-(Washington-State).-Public-library
SO: Library-Hi-Tech; 6 (3) 1988, 103-111. tables
PY: 1988
CC[ TogOjcAw Tog
AN: 89-4106
--------------------------------------------------------------------------------
```

Fig.21: Extract from title list to retrieve '*CD$ *and* (*T$ *or* *U$)'

```
SilverPlatter 1.6            LISA (1/69 - 9/89)

                                                                    1 of 3
TI: A management information system for the public library.
AU: Zijlstra-Paul
CC: NkkFv Nkk
AN: 89-3440
                                                                    2 of 3
TI: Management information systems for public libraries. Concepts, principles
 and outline research programme
AU: Thomas,-H-A; Waghorn,-C-A; British-Library-Research-Paper-25
CC: NkkFv  Nkk
AN: 88-690
                                                                    3 of 3
TI: The 75th anniversary of Hagen library centre: forward into an open future
AU: Traub,-Johannes
CC: NkmFvD433  Nkm
AN: 87-769
```

Fig.19: Title list to retrieve LISA Notation 'Nk$ *and* *Fv$'

```
SilverPlatter 1.6            LISA (1/69 - 9/89)

                                                                    1 of 1
TI: An independent advisory unit on library automation supported by South
 Holland Provincial Council
AU: Hardonk,-Harry; South-Holland-(Netherlands)-Public-libraries
CC: OqNkmFv  Oq
AN: 87-6083
```

Fig.20: A new title having searched for LISA Notation 'Nk$ *and* *Fv$'

```
TI: Cataloging CD-ROMs at the Ohio State University.
AU: Wang-Anna; Ohio-State-University.-Libraries
SO: Serials-Review; 14 (3) 1988, 11-21. illus. 9 refs.
PY: 1988
CC[ ThUz& Th
AN: 89-2543
--------------------------------------------------------------------------------

TI: The politics of CD-ROM: the legislative perplex
AU: Wismer,-Donald; MaineCat
SO: Laserdisk-Professional, 1 (1) May 88, 76-79
PY: 1988
CC[ UzhOqjc  Uzh
AN: 88-5292
--------------------------------------------------------------------------------
```

Fig.22: Titles, missed in searching for LISA-Notation 'Tog'

```
SilverPlatter 1.6              LISA (1/69 - 9/89)

                                                                    1 of 2
TI: Microcomputers and LAN's: are they a vialbe part of your future?
AU: Schmidt,-Sandy
CC: OunNk  Oun
AN: 88-3458

                                                                    2 of 2
TI: Quality assurance and online searching
AU: Chitty,-Mary; Gelb,-Linda;
 New-England-Online-Users-Group-Quality-Assurance-Committee
CC: ZmRnNk  Zm
AN: 88-478
```

Fig.16: New titles in searching for LISA Notation '*Nk'

```
SilverPlatter 1.6              LISA (1/69 - 9/89)

No.     Records  Request
1:          213  PRECIS
2:        17648  RETRIEVAL
3:         4335  ONLINE
4:          176  #1 and #2
5:            6  #1 and #3
6:            6  #1 and #2 and #3

                                                                    1 of 6
TI: Online public access to library files: 2nd National Conference, 5-7 April
 1986, University of Bath
AU: Rau,-Peter;
 Centre-for-Catalogue-Research,-Bath-University-(UK)-National-Conference-(1986)
CC: UegsAg  Uegs
AN: 88-2049

                                                                    2 of 6
TI: Browsing through PRECIS: structured subject access in an online catalogue
AU: Congrieve,-Juliet; Middlesex-Polytechnic-(UK)-Library; PRECIS
CC: UegsTiAw  Uegs
AN: 87-4659

                                                                    3 of 6
TI: Problems of subject access: (i) automatic generation of printed indexes and
 online thesaural control
AU: Congreve,-Juliet; Middlesex-Polytechnic-(UK)-Library
CC: UegsAwYa  Uegs
AN: 86-5282

                                                                    4 of 6
TI: Computer searching on PRECIS: an exploration of measuring comparative
 retrieval effectiveness
AU: DeHart,-Florence-E; Glazier,-Jack; PRECIS
CC: YpkVnnOq(PRE)  Ypk
AN: 85-2121

                                                                    5 of 6
TI: The AAT in the online catalog environment
AU: Petersen,-Toni; ARLIS/NA-(Art-Libraries-Society/North-America);
 Art-and-Architecture-Thesaurus-project-ARLIS/NA-(Art-Libraries-Society/North-
 America)
CC: ZdM(7)  Zd
AN: 83-5070

                                                                    6 of 6
TI: Southern Ontario: regional initiatives and trends
AU: Granda,-Sally
CC: RmD71  Rm
AN: 79-2892
```

Fig.23: Title list of the search in LISA-CD mentioned above

```
SilverPlatter 1.6              LISA (1/69 - 9/89)

                                                                    1 of 9
TI: Online public access to library files: 2nd National Conference, 5-7 April
 1986, University of Bath
AU: Rau,-Peter;
 Centre-for-Catalogue-Research,-Bath-University-(UK)-National-Conference-(1986)
CC: UegsAg  Uegs
AN: 88-2049

                                                                    2 of 9
TI: On-line public access to library files: 2nd National Conference. Progress
 and Prospects. April 1986. Centre for Catalogue Research, University of Bath
AU: Whitsed,-N;
 National-Conference-on-On-line-Public-Access-to-Library-Files-(UK,-1986)
CC: UegsDlAg  Uegs
AN: 88-931

                                                                    3 of 9
TI: Browsing through PRECIS: structured subject access in an online catalogue
AU: Congrieve,-Juliet; Middlesex-Polytechnic-(UK)-Library; PRECIS
CC: UegsTiAw  Uegs
AN: 87-4659

                                                                    4 of 9
TI: On-line public catalogues: some aspects of subject access
AU: Estivill-Rius,-Assumpcio; Ruis,-A-E
CC: Uegs  Uegs
AN: 86-4741

                                                                    5 of 9
TI: Problems of subject access: (i) automatic generation of printed indexes and
 online thesaural control
AU: Congreve,-Juliet; Middlesex-Polytechnic-(UK)-Library
CC: UegsAwYa  Uegs
AN: 86-5282

                                                                    6 of 9
TI: UDC as the medium for information retrieval in the automated network of
 university and research libraries
AU: Kautto,-Vesa
CC: ZkjVcXsi(UDC)  Zkj
AN: 80-1451

                                                                    7 of 9
TI: A complete delivery service for Canadian non-print media
AU: Dykstra,-Mary; National-Film-Board-of-Canada;
 N-F-B-(National-Film-Board,-Canada); PRECIS; Preserved-Context-Index-System
CC: ZkjVrsSjc  Zkj
AN: 79-1178

                                                                    8 of 9
TI: Syntactic versus non-syntactic indexing languages
AU: von-Cotta-Schoenberg,-Michael; Cotta-Schoenberg,-M-von
CC: VrhAzVdk  Vrh
AN: 76-3010

                                                                    9 of 9
TI: Card indexes or printed pages-physical substrates in index evaluation
AU: Coates,-E-J
CC: YaVrh  Ya
AN: 76-3678
```

Fig.24: Title list of the search 'PRECIS *and* (*Vr$ *or* *Zk$ *or* *Ueg$)