Module: Information Systems, 2nd Year Bachelor's Degree in computer science
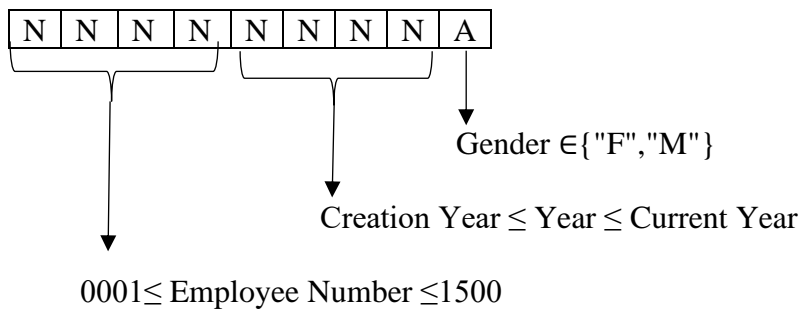
Solution for Tutorial 4

Exercise 1:

a. Employee ID

N	N	N	N	N	N	N	N	A

Gender $\in \{"F","M"\}$

Creation Year $\leq$ Year $\leq$ Current Year

$0001 \leq$ Employee Number ≤ 1500

Type: Articulated Coding

b. Service

N	N

$01 \leq$ Service Number ≤ 99

Type: Sequential Coding

c. Marital Status (MS)

Proposed Coding:

- **"S"** for Single
- **"M"** for Married
- **"D"** for Divorced
- **"W"** for Widowed

A

$MS \in \{"S","M","D","W"\}$

Type: Mnemonic Coding

Exercise 02:

City = 4 sectors (phases) = 30,000 housing units
Let A, B, C, and D represent the 4 sectors
A + B + C + D = 30,000
D = 2C, C = 2B, B = 2A
A + 2A + 4A + 8A = 30,000
15A = 30,000 → A = 2,000 housing units, B = 4,000, C = 8,000, D = 16,000

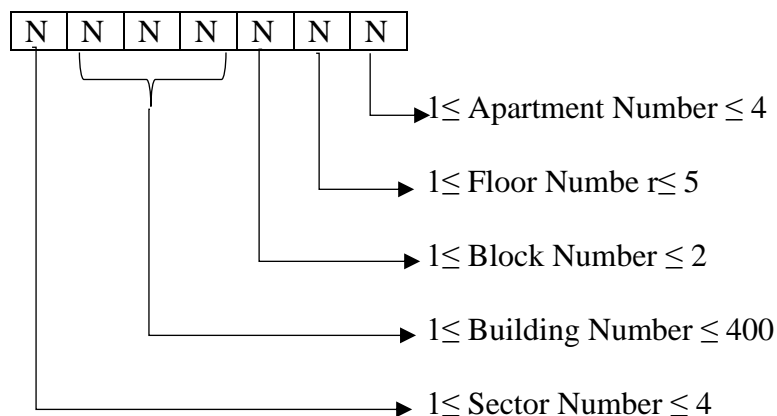**a.** 1 Building = 40 housing units

- A = 2,000 / 40 = 50 buildings
- B = 2A = 100 buildings
- C = 4A = 200 buildings
- D = 8A = 400 buildings

b. 1 building = 2 blocks
1 block = 20 housing units
1 block = 5 floors → 1 floor = 20 / 5 = 4 housing units

N	N	N	N	N	N	N

$1 \leq$ Apartment Number ≤ 4

$1 \leq$ Floor Numbe r≤ 5

$1 \leq$ Block Number ≤ 2

$1 \leq$ Building Number ≤ 400

$1 \leq$ Sector Number ≤ 4

Type: Multilevel (or hierarchical) coding system

Exercise 03:

1. **Document Type (DT):**
   - Use a code to indicate the type of document:
     - **1** for Books
     - **2** for Dissertations
     - **3** for Journals
2. **Document Number (DN):**
   - For books: 1 to 500
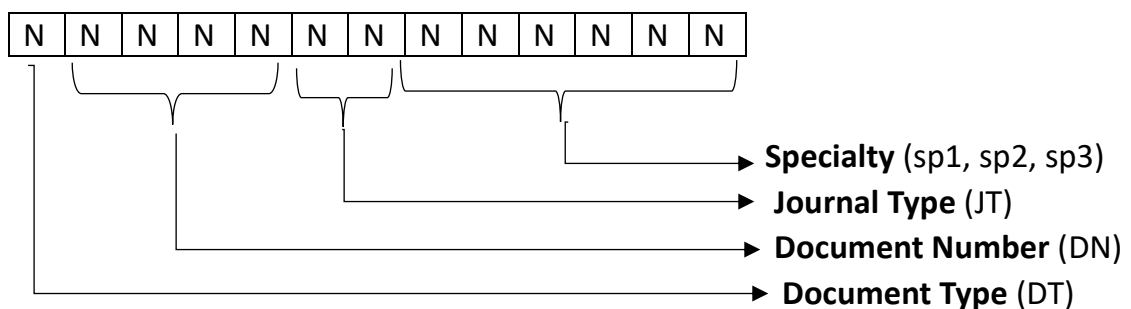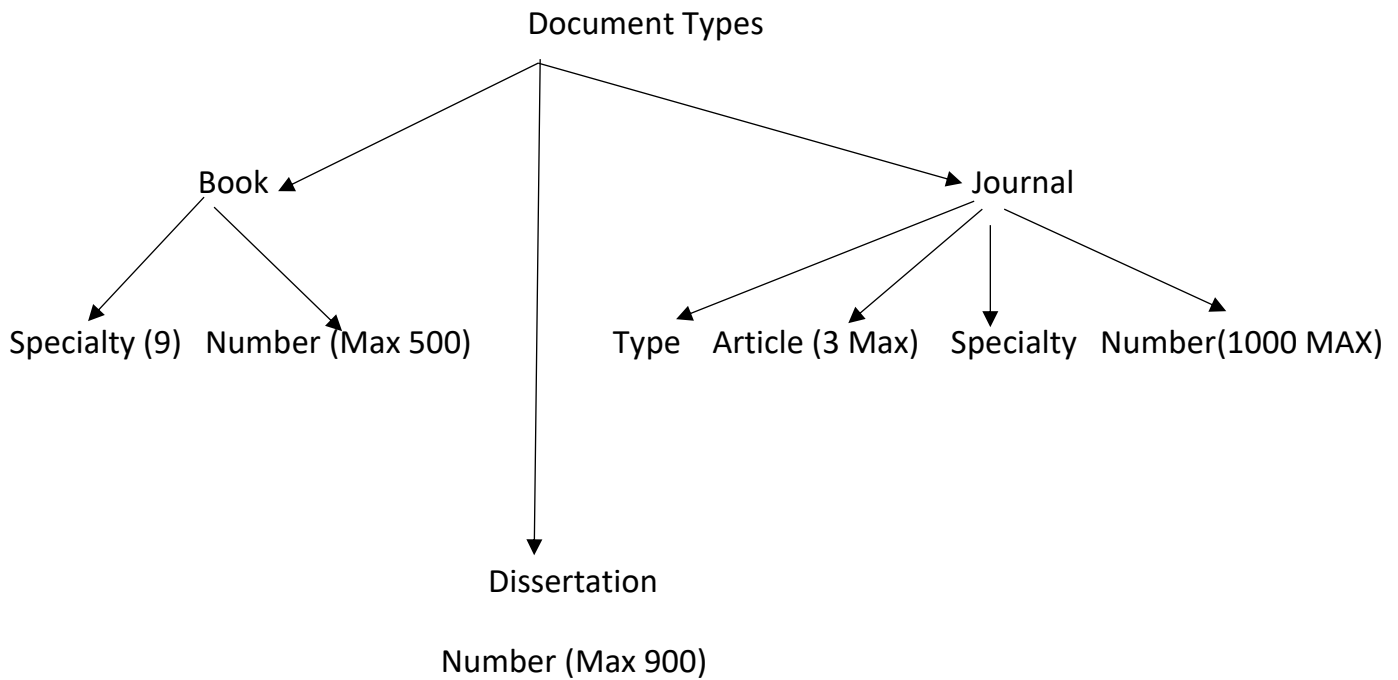   - For dissertations: 1 to 900
   - For journals: 1 to 1000
3. **Specialty (SP):**
   - Each document is related to one or more specialties, coded as:

- **SP1, SP2, SP3**: For books, **SP1** is filled. For journals, depending on the number of articles, **SP1** for one article, **SP1 and SP2** for two articles, and **SP1, SP2, and SP3** for three articles.
- Each specialty is coded from **01** to **09**, corresponding to the 9 specialties in computer science.

4. **Journal Type (JT):**
   - Journals are numbered from **1** to **10**, corresponding to the 10 subscribed journals.

Document Types

Book → Journal

Specialty (9)   Number (Max 500)   Type   Article (3 Max)   Specialty   Number(1000 MAX)

Dissertation

Number (Max 900)

| N | N | N | N | N | N | N | N | N | N | N | N | N |

Specialty (sp1, sp2, sp3)
Journal Type (JT)
Document Number (DN)
Document Type (DT)

Type: Articulated Coding

Note: The "Specialty" field remains empty in the case of a dissertation. Only **SP1** will be filled for a book, and depending on the number of articles in a journal: **SP1** for one article, **SP1** and **SP2** for two articles, and **SP1**, **SP2**, and **SP3** for three articles.