CS 2310 Exercise 4

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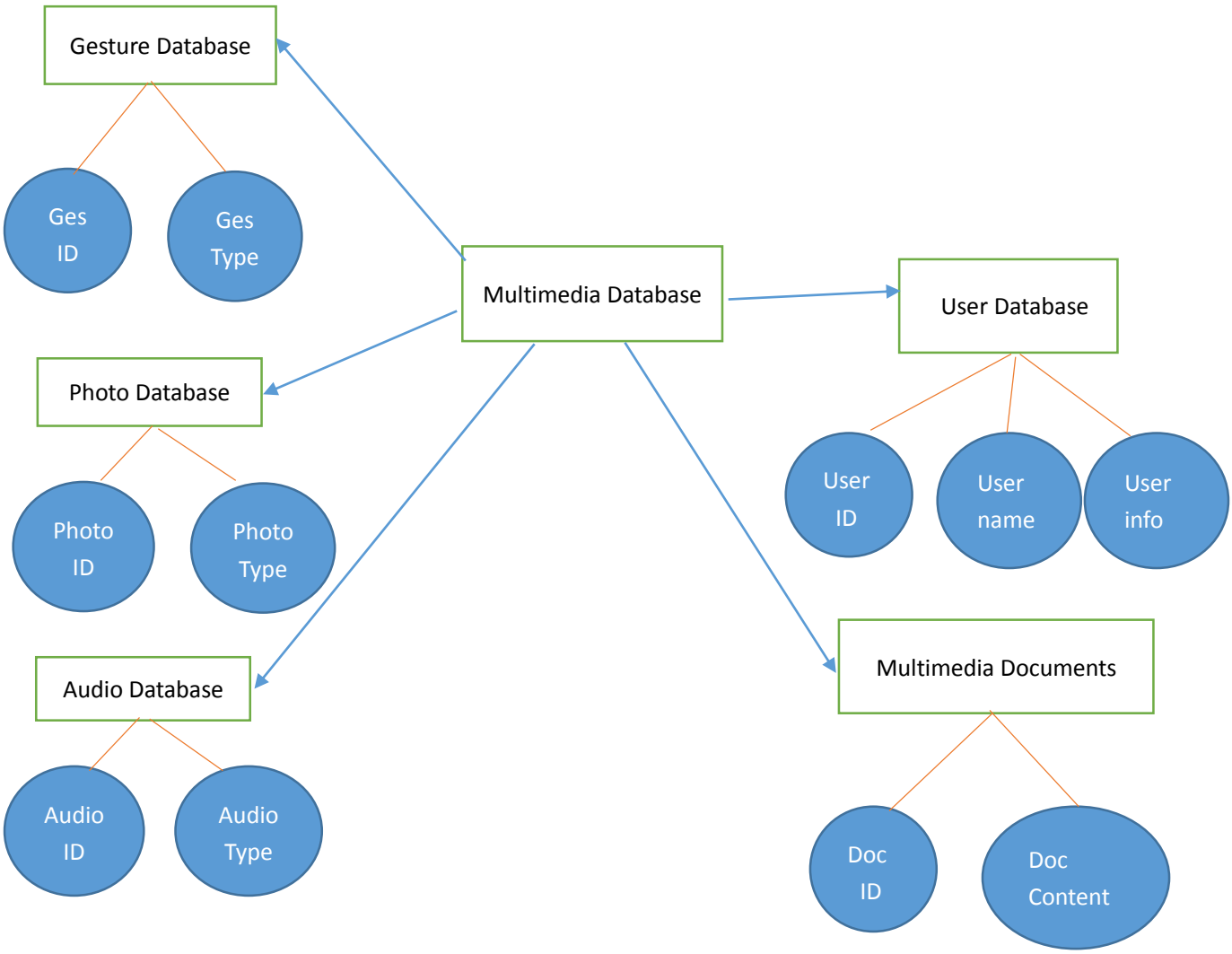
The purpose of this exercise is to apply multimedia functional dependency to multimedia applications design. Given an application (its requirements), design the multimedia database using multimedia functional dependency theory. Then specify the patterns (IC cards) associated with the multimedia database. The application is the personal health care system that allows the user (a senior citizen) to access related multimedia documents using gestures. A new classification scheme based upon the gestures associated with the multimedia documents is to be introduced. This would allow users to search for multimedia documents similar to a known audio search key (such as the voice of a certain author). Your task is to design the multimedia database and associate patterns (IC cards), which can in turn be transformed into IC index and finally an implementation.

Figure1.1 Design of Multimedia Database:



Description of the multimedia database:

In this Database, which is a multimedia database, contains three special databases, which store different information, one is Gesture database, which stores the Gesture type and what this kind of information represented by this type of gesture. And now, based on the new classification scheme, audio (Voice) or other way can be searched as a key in the database. And use those keys, the database can find an ID, which can be used as key to search information in the multimedia documents.

There are three databases which stores gesture, audio, and photo respectively. When the gesture sensor gets a signal from the senior citizen, the sensor will distinguished which type of this signal, and search this signal from the database, find which kind of information should be sent to multimedia Documents, and the multimedia document content will decide what should do, such as send message to doctor.

Multimedia Functional Dependencies:

MFD1: {Gesture ID, Gesture Type} g1(t1) -> {Doc ID, Doc Content} g2(t2)

MFD2: {Gesture ID, Gesture Type} g1(t1) -> {User ID, User name, User Info} g3(t3)

MFD3: {Photo ID, Photo Type} g4(t4) -> {Doc ID, Doc Content} g2(t2)

MFD4: {Photo ID, Photo Type} g4(t4) -> {User ID, User name, User Info} g3(t3)

MFD5: {Audio ID, Audio Type} g5(t5) -> {Doc ID, Doc Content} g2(t2)

MFD6: {Audio ID, Audio Type} g6(t6) -> {User ID, User name, User Info} g3(t3)

IC cards for the multimedia database system:

IC Card IC Name: Multimedia Database

Description: Connect each databases with proper protocol and updatel

Interaction Pattern:

○ Quiet State ○ By Myself no Interaction ○ By Myself with Interaction ○ By Others no Interaction ○ By Others with Interaction ◉ Mixed

My Task: Connect each database with each other

Time Critical Condition: None

Name of Other IC: User Database, Multimedia Database, etc

Message to Other IC: message from where to where

Other IC's Task: send messge to MultimediaDatabase

Card 1 of 1 (If necessary please use several IC cards to describe an IC)

IC Card IC Name: Gesture Database

Description: search gesture id and find corresponding Documents

Interaction Pattern:

○ Quiet State ○ By Myself no Interaction ◉ By Myself with Interaction ○ By Others no Interaction ○ By Others with Interaction ○ Mixed

My Task: Read gesture type and search for ID and send message

Time Critical Condition: none

Name of Other IC: Multimedia database

Message to Other IC: Here is the gesture ID

Other IC's Task: transfer it to find corresponding documents

Card 1 of 1 (If necessary please use several IC cards to describe an IC)

IC Card IC Name: Photo Database

Description: search photo and send message

Interaction Pattern:

○ Quiet State ○ By Myself no Interaction ◉ By Myself with Interaction ○ By Others no Interaction ○ By Others with Interaction ○ Mixed

My Task: Search the photo type and send ID for getting document

Time Critical Condition: none

Name of Other IC: Multimedia

Message to Other IC: Here is the photo ID

Other IC's Task: transfer it to get document

Card 1 of 1 (If necessary please use several IC cards to describe an IC)

IC Card IC Name: Audio Database

Description: Search Audio ID and send the message

Interaction Pattern:

○ Quiet State ○ By Myself no Interaction ◉ By Myself with Interaction ○ By Others no Interaction ○ By Others with Interaction ○ Mixed

My Task: Search audio type and send the corresponding id

Time Critical Condition: none

Name of Other IC: Multimedia database

Message to Other IC: here is the audio ID

Other IC's Task: transfer it to get the corresponding document

Card 1 of 1 (If necessary please use several IC cards to describe an IC)

IC Card IC Name: User Database

Description: return user info and update user profile

Interaction Pattern:

○ Quiet State ○ By Myself no Interaction ◉ By Myself with Interaction ○ By Others no Interaction ○ By Others with Interaction ○ Mixed

My Task: update the database when there is a new user or user leaves

Time Critical Condition: none

Name of Other IC: multimedia database

Message to Other IC: none

Other IC's Task: none

Card 1 of 1 (If necessary please use several IC cards to describe an IC)

IC Card IC Name: Multimedia Document

Description: Based on the ID and return the corresponding document

Interaction Pattern:

○ Quiet State ○ By Myself no Interaction ◉ By Myself with Interaction ○ By Others no Interaction ○ By Others with Interaction ○ Mixed

My Task: return the document content and id and servise based on ID

Time Critical Condition: none

Name of Other IC: multimedia database

Message to Other IC: here is he document id and the document

Other IC's Task: send ID

Card 1 of 1 (If necessary please use several IC cards to describe an IC)