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| **Data base Techniques** |
| (XML) |
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**Home Work 5**

Q1:

<bank>

<account>

<account\_number> A-101 </account\_number>

<branch\_name> Downtown </branch\_name>

<balance> 500 </balance>

</account>

<account>

<account\_number> A-102 </account\_number>

<branch\_name> Perryridge</branch\_name>

<balance> 400 </balance>

</account>

<account>

<account\_number> A-201</account\_number>

<branch\_name>Brighton </branch\_name>

<balance> 900 </balance>

</account>

<customer>

<customer\_name> Johnson </ customer\_name >

<customer\_street> Aima </ customer\_street >

<customer\_city> Palo Aito </ customer\_city >

</customer>

<customer>

<customer\_name> Hayes </ customer\_name >

<customer\_street>Main </ customer\_street >

<customer\_city> Harrison </ customer\_city >

</customer>

<depositor>

<account\_number> A-101 </account\_number>

<customer\_name> Johnson </customer\_name>

</depositor>

<depositor>

<account\_number> A-201 </account\_number>

<customer\_name> Johnson </customer\_name>

</depositor>

<depositor>

<account\_number> A-102 </account\_number>

<customer\_name> Hayes </customer\_name>

</depositor>

</bank>

Figure 3.1

1. Give an alternative representation of bank information containing the same data as in **Firgure3.1**, but using attributes instead of sub-elements. Also give the DTD for this representation.

ANSWER:

**Alternative representation of the bank information using attributes instead of sub-elements,**

<bank-1>

<account acct-type = “checking” >

<account-number> A-101 </account-number>

<branch-name> Downtown </branch-name>

<balance> 500 </balance>

</account>

<account acct-type = “saving” >

<account-number> A-102 </account-number>

<branch-name> Perryridge </branch-name>

<balance> 400 </balance>

</account>

<account acct-type = “checking” >

<account-number> A-201 </account-number>

<branch-name> Brighton </branch-name>

<balance> 900 </balance>

</account>

<customer>

<customer\_name> Johnson </ customer\_name >

<customer\_street> Aima </ customer\_street >

<customer\_city> Palo Aito </ customer\_city >

</customer>

<customer>

<customer\_name> Hayes </ customer\_name >

<customer\_street>Main </ customer\_street >

<customer\_city> Harrison </ customer\_city >

</customer>

<depositor>

<account\_number> A-101 </account\_number>

<customer\_name> Johnson </customer\_name>

</depositor>

<depositor>

<account\_number> A-201 </account\_number>

<customer\_name> Johnson </customer\_name>

</depositor>

<depositor>

<account\_number> A-102 </account\_number>

<customer\_name> Hayes </customer\_name>

</depositor>

</bank-1>

# DTD representation of the bank scheme:

*<*!DOCTYPE bank [

*<*!ELEMENT bank (account|customer|depositor)+)*>*

*<*!ELEMENT account (account\_number branch\_name balance)*>*

*<*!ELEMENT customer (customer\_name customer\_street customer\_city)*>*

*<*!ELEMENT depositor (customer\_name account\_number)*>*

*<*!ELEMENT account\_number( #PCDATA )*>*

*<*!ELEMENT branch\_name( #PCDATA )*>*

*<*!ELEMENT balance( #PCDATA )*>*

*<*!ELEMENT customer\_name( #PCDATA )*>*

*<*!ELEMENT customer\_street( #PCDATA )*>*

*<*!ELEMENT customer\_city( #PCDATA )*>*

] *>*

Q 2: Give the DTD for an XML representation of the following nested-relational schema.

*Emp=(ename, ChildrenSet multiset(Children), SkillSet multiset(Skills))*

*Children = (name, birthday)*

*Birthday = (day, month, year)*

*Skills = (type, ExmSet setoff(Exams))*

*Exams = (year, city)*

# Answer:

*<*!DOCTYPE db [

*<*!ELEMENT emp (ename, children\*, skills\*)*>*

*<*!ELEMENT children (name, birthday)*>*

*<*!ELEMENT birthday (day, month, year)*>*

*<*!ELEMENT skills (type, exams+)*>*

*<*!ELEMENT exams (year, city)*>*

*<*!ELEMENT ename( #PCDATA )*>*

*<*!ELEMENT name( #PCDATA )*>*

*<*!ELEMENT day( #PCDATA )*>*

*<*!ELEMENT month( #PCDATA )*>*

*<*!ELEMENT year( #PCDATA )*>*

*<*!ELEMENT type( #PCDATA )*>*

*<*!ELEMENT city( #PCDATA )*>*

] *>*

Q 3: Write a query in Xpath on the DTD of exercise 2(last one) to list all skill types in Emp.

# AnsWER:

For $t in distinct-values (doc (emp.xml)/db/emp/skills/type)

Return $t.

Q 4: Write a query in Xquery on the XML representation in Figure 3.1 to find the total balance, across all accounts, at each branch.

ANSWER:

For $b in distinct (doc(emp.xml)/bank/account/branch-name)

return

*<*branch-total*>*

*<*branch-name*>* $b/text() *<*/branch-name*>*

let $s := sum (doc(emp.xml)/bank/account[branch-name=$b]/balance)

return *<*total-balance*>* $s *<*/total-balance*>*

*<*/branch-total*>*

*<*!DOCTYPE bibliography [

*<*!ELEMENT book (title, author+, year, publisher, place?)*>*

*<*!ELEMENT article (title, author+, journal, year, number, volume, pages?)*>*

*<*!ELEMENT author ( last-name, first-name) *>*

*<*!ELEMENT title ( #PCDATA )*>*

*???*similar PCDATA declarations for year, publisher, place, journal, year,

number, volume, pages, last-name and first-name

] *>*

Q 5: Write the following queries in X query, assuming the DTD from exercise 2.

(A). Find the name of all employees whi have a child who has a birthday in March.

(B). Find those employees who took an examination for the skill type “typing” in the city “Dayton”.

(C). List all skill types in Emp.

(A): Find the name of all employees which have a child who has a birthday in March.

# AnsWER:

for $e in doc(emp.xml)/db/emp,

$m in distinct($e/children/birthday/month)

where $m = ’March’

return $e/ename

(B). Find those employees who took an examination for the skill type “typing” in the city “Dayton”.

ANSWER:

for $e in doc(emp.xml)/db/emp

$s in $e/skills[type=’typing’]

$exam in $s/exams

where $exam/city= ’Dayton’

return $e/ename

(C). List all skill types in Emp.

ANSWER: for $t in distinct-values (doc(emp.xml)/db/emp/skills/type)

return $t.