

Database Systems 2

Xquery exercises

AA 2019-2020

DTD

<!ELEMENT RESTAURANTS (RESTAURANT+)>

<!ELEMENT RESTAURANT (NAME, DISH+)>

<!ELEMENT DISH (NAME, INGREDIENT+, PRICE)>

<!ELEMENT INGREDIENT (NAME, WEIGHT)>

Queries

- Q1: WHICH DISHES ARE OFFERED BY THE RESTAURANT “BELLA NAPOLI”?
- Q2: FOR EACH RESTAURANT RETURN THE NUMBER OF AVAILABLE DISHES
- Q3: HOW MANY RESTAURANTS PREPARE DISHES WITH MUSHROOMS?
- Q4: FOR EACH RESTAURANT IDENTIFY THE MOST EXPENSIVE DISH(ES)
- Q5: WHICH IS THE RESTAURANT WITH THE MAXIMUM NUMBER OF DISHES?
- Q6: FOR EACH INGREDIENT RETURN THE LIST OF RESTAURANTS THAT USE IT
- Q7: FOR EACH RESTAURANT LIST THEIR DISHES SORTED BY NUMBER OF INGREDIENTS

Q1

- WHICH DISHES ARE OFFERED BY THE RESTAURANT “BELLA NAPOLI”?

```
<!ELEMENT RESTAURANTS (RESTAURANT+)>
<!ELEMENT RESTAURANT (NAME, DISH+)>
<!ELEMENT DISH (NAME, INGREDIENT+, PRICE)>
<!ELEMENT INGREDIENT (NAME, WEIGHT)>
```

```
<result>
  { FOR $d in doc("rest.xml")/restaurants/restaurant[name="Bella
    Napoli"]/dish
    RETURN <dish-name> {$d/name/text()} </dish-name> }
</result>
```

Q2

- Q2: FOR EACH RESTAURANT RETURN THE NUMBER OF AVAILABLE DISHES

```
<!ELEMENT RESTAURANTS (RESTAURANT+)>  
<!ELEMENT RESTAURANT (NAME, DISH+)>  
<!ELEMENT DISH (NAME, INGREDIENT+, PRICE)>  
<!ELEMENT INGREDIENT (NAME, WEIGHT)>
```

FOR \$r in doc("rest.xml")/restaurants/restaurant

LET \$d := \$r/dish

RETURN <restaurant-dishes>

 {\$r/name}

 <num-dishes> {count(\$d)} </num-dishes>

</restaurant-dishes>

Q3

- Q3: HOW MANY RESTAURANTS PREPARE DISHES WITH MUSHROOMS?

```
<!ELEMENT RESTAURANTS (RESTAURANT+)>  
<!ELEMENT RESTAURANT (NAME, DISH+)>  
<!ELEMENT DISH (NAME, INGREDIENT+, PRICE)>  
<!ELEMENT INGREDIENT (NAME, WEIGHT)>
```

```
LET $r :=  
doc("rest.xml")/restaurants/restaurant[dish/ingredient/  
    name="mushroom"]  
RETURN <count>  
    {count($r)}  
</count>
```

Q4

- Q4: FOR EACH RESTAURANT IDENTIFY THE MOST EXPENSIVE DISH(ES)

```
<!ELEMENT RESTAURANTS (RESTAURANT+)>  
<!ELEMENT RESTAURANT (NAME, DISH+)>  
<!ELEMENT DISH (NAME, INGREDIENT+, PRICE)>  
<!ELEMENT INGREDIENT (NAME, WEIGHT)>
```

```
FOR $r in doc("rest.xml")/restaurants/restaurant
```

```
LET $maxprice := max($r/dish/price)
```

```
RETURN <restaurant-dishes>
```

```
  {$r/name}
```

```
  <expensive> {$r/dish[price=$maxprice]/name} </expensive>
```

```
</restaurant-dishes>
```

Q5

- Q5: WHICH IS THE RESTAURANT WITH THE MAXIMUM NUMBER OF DISHES?

```
<!ELEMENT RESTAURANTS (RESTAURANT+)>  
<!ELEMENT RESTAURANT (NAME, DISH+)>  
<!ELEMENT DISH (NAME, INGREDIENT+, PRICE)>  
<!ELEMENT INGREDIENT (NAME, WEIGHT)>
```

```
LET $maxnumdishes := max(  
    FOR $r in doc("rest.xml")/restaurants/restaurant  
    RETURN count($r/dish))  
)  
RETURN <restaurant>  
    {doc("rest.xml")/restaurants/restaurant[count(dish)=$maxnum  
        dishes]/name}  
    </restaurant>
```


Q6

- Q6: FOR EACH INGREDIENT RETURN THE LIST OF RESTAURANTS THAT USE IT

```
<!ELEMENT RESTAURANTS (RESTAURANT+)>
<!ELEMENT RESTAURANT (NAME, DISH+)>
<!ELEMENT DISH (NAME, INGREDIENT+, PRICE)>
<!ELEMENT INGREDIENT (NAME, WEIGHT)>
```

```
FOR $i in distinct-values(doc("rest.xml")/restaurants/restaurant/dish/ingredient)
RETURN <ingredient>
  <ingredient-name>{$i/name}</ingredient-name>
  <restaurants>
    {FOR $r in distinct-values(doc("rest.xml")
      /restaurants/restaurant[dish/ingredient/name=$i/name])
      RETURN $r/name
    }
  </restaurants>
</ingredient>
```

Q7

- Q7: FOR EACH RESTAURANT LIST THEIR DISHES SORTED BY NUMBER OF INGREDIENTS

```
<!ELEMENT RESTAURANTS (RESTAURANT+)>
<!ELEMENT RESTAURANT (NAME, DISH+)>
<!ELEMENT DISH (NAME, INGREDIENT+, PRICE)>
<!ELEMENT INGREDIENT (NAME, WEIGHT)>
```

<result>

{FOR \$r in doc("rest.xml")/restaurants/restaurant/

RETURN <restaurant> {\$r/name}

<dishes>

{FOR \$d in doc("rest.xml")/restaurants/restaurant[name=\$r/name]/dish)

ORDER BY count(\$d/ingredient)

RETURN \$d/name

}

</dishes>

</restaurant>}

<result>