Politecnico di Torino
Database Management Systems

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Trigger: Draft solution

1. The following relations are given (primary keys are underlined, optional attributes are denoted with
*):

> DRUG(<u>DCode</u>, DName, DrugCompany, Price, PerCentDiscount*)
> SHOPPING_CART(<u>CCode</u>, CustomerID, Date, State)
> CONTENTS_OF_SHOPPING_CART(<u>CCode</u>, <u>DCode</u>, NumberOfPackages, Amount,
> AvailabilityState)
> LEVEL_OF_WAREHOUSE(<u>DCode</u>, NumberOfAvailablePackages)
> SENDING_REQUEST(<u>CCode</u>, <u>DCode</u>, NumberOfPackages)
> DRUG_SELECTION(<u>SCode</u>, CCode, DCode, NumberOfPackages)

Write the triggers managing the following activities in a on-line drug store. The CONTENTS_OF_SHOPPING_CART
table lists the drugs included in the electronic shopping cart described in the SHOPPING_CART table.

(1) *Selection of a drug for the purchase.* Write the trigger to update the contents of the shopping
cart when a new product to be entered in the shopping cart is selected (insert in the DRUG_SELECTION
table). You should examine the availability in stock of the drug (table LEVEL_OF_WAREHOUSE). Assume
that the drug is always present in the warehouse, also with zero packaging available. If the number
of available packages is greater than the number of requested packages, you must enter the requested
drug in the shopping cart (table CONTENTS_OF_SHOPPING_CART). The availability state should be set to
'A' (i.e., it is available). You should also calculate the amount, according to the price of the drug and
the possible applied discount (attribute PerCentDiscount, value expressed as a percentage). Finally,
the availability in stock must be updated. If the number of available packages is less than the number
of requested packages, the drug should be inserted in the shopping cart for the available quantity.
The availability state should be set to 'P' (i.e., it is partial). The available quantity in stock must
be updated accordingly. Finally, if there is no availability, the drug should not be included in the
shopping cart.

```
create or replace trigger drug_selection
after insert on DRUG_SELECTION
for each row

declare
AvQty number;
DrugPrice number;
DrugDiscount number;
PurchasedQty number;
message varchar(5);


begin

---check the availability in stock of the drug
select NumberOfAvailablePackages into AvQty
from LEVEL_OF_WAREHOUSE
where DCode = :new.DCode;
```

```
if (AvQty > 0) then
---at least one package is available

---read both price and applied discount for the drug
  select Price, PerCentDiscount into DrugPrice, DrugDiscount
  from DRUG
  where DCode = :new.DCode;

---compute the amount for the drug when a discount is applied
  if (DrugDiscount IS NOT NULL) then
    DrugPrice := DrugPrice * (100 - DrugDiscount)/100;
  end if;

  if (AvQty >= :new.NumberOfPackages) then

---all requested packages are available
    PurchasedQty := :new.NumberOfPackages;
    message := 'A';

  else

---not all requested packages are available
    PurchasedQty := AvQty;
    message := 'P';

  end if;

---update LEVEL_OF_WAREHOUSE
    update LEVEL_OF_WAREHOUSE
    set NumberOfAvailablePackages = NumberOfAvailablePackages - PurchasedQty
    where DCode = :new.DCode;


---update CONTENTS_OF_SHOPPING_CART
    insert into CONTENTS_OF_SHOPPING_CART(CCode, DCode, NumberOfPackages, Amount,
        AvailabilityState)
    values (:new.CCode, :new.DCode, PurchasedQty, DrugPrice*PurchasedQty, message);

end if;
end;
```

(2) *Integrity constraint on the maximum number of drugs sold with high discount.* The same shopping cart (identified by the CCode attribute) can not include more than 20 items sold at a discount greater than 40%. Write the trigger that manages this integrity constraint.

```
EVENT: insert on CONTENTS_OF_SHOPPING_CART
       update of NumberOfPackages, DCode, CCode on CONTENTS_OF_SHOPPING_CART
EXECUTION GRANULARITY: statement level
EXECUTION MODE: after
CONDITION: no
ACTION: rollback


create or replace trigger maximum_number_of_drugs
after insert or update of NumberOfPackages, DCode, CCode on CONTENTS_OF_SHOPPING_CART

declare
N number;

begin

select count(*) into N
from SHOPPING_CART
where CCode IN (select CCode
            from CONTENTS_OF_SHOPPING_CART C, DRUG D
                where PerCentDiscount > 40
                and D.DCode = C.DCode
                group by CCode
                having sum(NumberOfPackages) > 20);

if (N <> 0) then
   raise_application_error (-20500, "constraint violated");
end if;
end;
```