*Task No1. Access settings*

**create** **schema** reports;

**create** **role** planadmin;

**create** **role** planmanager;

**CREATE** **USER** ivan;

**CREATE** **USER** sophie;

**CREATE** **USER** kirill;

**grant** **select** **on** **ALL** **TABLES** **IN** **schema** reports **to** planadmin, planmanager;

**grant** **select**, **update**, **insert**, **delete** **on** adventureworks21.reports.plan\_data **to** planadmin, planmanager;

**grant** **select**, **update**, **insert**, **delete** **on** adventureworks21.reports.plan\_status **to** planadmin;

**grant** **select**, **update** **on** adventureworks21.reports.plan\_status **to** planmanager;

**grant** **select**, **update**, **insert**, **delete** **on** adventureworks21.reports.country\_managers **to** planadmin;

**grant** **select** **on** adventureworks21.reports.country\_managers **to** planmanager;

**grant** **select**, **update** **on** adventureworks21.reports.v\_plan\_edit **to** planmanager;

**grant** **select** **on** adventureworks21.reports.v\_plan **to** planmanager;

**revoke** **select** **on** adventureworks21.reports.v\_plan\_edit, adventureworks21.reports.v\_plan **from** planadmin;

**insert** **into** adventureworks21.reports.country\_managers (username, country)

**values** ('sophie', 'US')

, ('sophie', 'CA')

, ('kirill', 'FR')

, ('kirill', 'GB')

, ('kirill', 'DE')

, ('kirill', 'AU')

*Task No2. product2 & country 2 materialized views*

**create** **materialized** **view** adventureworks21.reports.product2

**as**

**select** p3.productcategoryid **as** pcid

, p.productid

, p3."name" **as** pcname

, p."name" **as** pname

**from** adventureworks21.public.product p

**join** adventureworks21.public.productsubcategory p2

**on** p.productsubcategoryid = p2.productsubcategoryid

**join** adventureworks21.public.productcategory p3

**on** p2.productcategoryid = p3.productcategoryid

**with** **data**

**create** **materialized** **view** adventureworks21.reports.country2

**as**

**select** a.countryregioncode

**from** adventureworks21.public.customer c

**join** adventureworks21.public.customeraddress c2

**on** c.customerid = c2.customerid

**and** c2.addresstype = 'Main Office'

**join** adventureworks21.public.address a

**on** a.addressid = c2.addressid

**group** **by** 1

**with** **data**

**grant** **select** **on** adventureworks21.reports.product2, adventureworks21.reports.country2 **to** planadmin, planmanager;

*Task No3. Loading data into the company table*

**insert** **into** adventureworks21.reports.company (cname, countrycode, city)

**select** **distinct**

c.companyname **as** cname

, a.countryregioncode **as** countrycode

, a.city **as** city

**from** adventureworks21.public.customer c

**join** adventureworks21.public.customeraddress c2

**on** c.customerid = c2.customerid

**and** c2.addresstype = 'Main Office'

**join** adventureworks21.public.address a

**on** a.addressid = c2.addressid

**where** c.companyname **is** **not** **null**

*Task No4. Company classification heading*

**insert** **into** adventureworks21.reports.company\_abc

**with** dataset **as**

(

**select** **extract**(**year** **from** s.orderdate) **as** y

, c.companyname **as** cname

, **sum**(s.subtotal) **as** company\_total

, **sum**(**sum**(s.subtotal)) **over** (**partition** **by** **extract**(**year** **from** s.orderdate)) **as** S

**from** adventureworks21.public.salesorderheader s

**join** adventureworks21.public.customer c

**on** c.customerid = s.customerid

**and** c.companyname **is** **not** **null**

**where** **extract**(**year** **from** s.orderdate) **in** (2012, 2013)

**group** **by** 1, 2

)

, dataset\_post **as**

(

**select** \*

, 0.8 \* d.S **as** Sa

, 0.95 \* d.S **as** Sb

, **row\_number**() **over** (**partition** **by** y **order** **by** company\_total **desc**) **as** ST

**from**

dataset **as** d

)

, final\_set **as**

(

**select** \*

, **sum**(company\_total) **over** (**partition** **by** y **order** **by** st **ROWS** **BETWEEN** **CURRENT** **ROW** **AND** **unbounded** **FOLLOWING**) **as** SRT

**from** dataset\_post

)

**select** c2.id **as** cid

, f.company\_total **as** salestotal

, **case** **when** srt > Sb **then** 'C'

**when** srt **between** Sa **and** Sb **then** 'B'

**else** 'A' **end** **as** cls

, y **as** **year**

**from** final\_set f

**join** adventureworks21.reports.company c2

**on** f.cname = c2.cname

;

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*Task No5. Finding quarterly sales amount by company, and product category*

**insert** **into** adventureworks21.reports.company\_sales

**select** c2.id **as** cid

, **sum**(s.linetotal) **as** salesamt

, **extract**(**year** **from** s2.orderdate) **as** **year**

, **extract**(**quarter** **from** s2.orderdate) **as** quarter\_yr

, **extract**(**year** **from** s2.orderdate)||'.'||**extract**(**quarter** **from** s2.orderdate) **as** qr

, p.pcid **as** categoryid

, ca.cls **as** ccls

**from** adventureworks21.public.salesorderdetail s

**join** adventureworks21.public.salesorderheader s2

**on** s.salesorderid =s2.salesorderid

**join** adventureworks21.public.customer c

**on** c.customerid = s2.customerid

**and** c.companyname **is** **not** **null**

**join** adventureworks21.reports.company c2

**on** c2.cname = c.companyname

**join** adventureworks21.reports.product2 p

**on** p.productid = s.productid

**join** adventureworks21.reports.company\_abc ca

**on** ca.cid = c2.id

**and** **extract**(**year** **from** s2.orderdate) = ca."year"

**where** **extract**(**year** **from** s2.orderdate) **in** (2012, 2013)

**group** **by** 1, 3, 4, 5, 6, 7

*Task No6. Initial data preparation*

def start\_planning(**year**, **quarter**, **user**, pwd):

con = psycopg2.**connect**(**database** = 'adventureworks21'

, **user** = **user**

, password = pwd

, **host** = 'localhost')

con.autocommit = **True**

**cursor** = con.**cursor**()

quarterid = str(**year**) + '.' + str(**quarter**)

**cursor**.**execute**(f"delete from adventureworks21.reports.plan\_data where quarterid = '{quarterid}'")

**cursor**.**execute**(f"delete from adventureworks21.reports.plan\_status where quarterid = '{quarterid}'")

insert\_query = f"""insert into adventureworks21.reports.plan\_status

select distinct

'{quarterid}'

, 'R'

, now()::timestamp

, '{user}'

, c.countrycode

from adventureworks21.reports.company c """

**cursor**.**execute**(insert\_query)

insert\_query = f"""

insert into adventureworks21.reports.plan\_data

with data\_init as

(

select \*

from adventureworks21.reports.country2 c

cross join (select distinct p.pcid from adventureworks21.reports.product2 p ) as t

)

, data\_sales as

(

select c.countrycode as country

, cs.categoryid as pcid

, sum(cs.salesamt)/2 as salesamt

from adventureworks21.reports.company\_sales cs

join adventureworks21.reports.company c

on c.id = cs.cid

where cs.quarter\_yr = {quarter}

and cs."**year**" in ({year - 2}, {year - 2})

and cs.ccls in ('A', 'B')

group by 1, 2

)

select 'N' as versionid

, di.countryregioncode as country

, '{quarterid}' as quarterid

, di.pcid

, coalesce(ds.salesamt, 0) as salesamt

from data\_init di

left join data\_sales ds

on di.countryregioncode = ds.country

and di.pcid = ds.pcid

"""

**cursor**.**execute**(insert\_query)

insert\_query = f"""

insert into adventureworks21.reports.plan\_data

select 'P'

, country

, quarterid

, pcid

, salesamt

from adventureworks21.reports.plan\_data

where versionid = 'N'

and quarterid = '{quarterid}'

"""

**cursor**.**execute**(insert\_query)

**cursor**.**close**()

*start\_planning(2014, 1, 'ivan', 123)*

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*Task No7. Changing the plan data*

def set\_lock(**year**, **quarter**, **user**, pwd):

con = psycopg2.**connect**(**database** = 'adventureworks21'

, **user** = **user**

, **password** = pwd

, **host** = 'localhost')

con.autocommit = **True**

**cursor** = con.**cursor**()

quarterid = str(**year**) + '.' + str(**quarter**)

update\_query = f"""

update adventureworks21.reports.plan\_status

set status = 'L'

, modifieddatetime = now()::timestamp

, author = current\_user

where country in (select cm.country

from adventureworks21.reports.country\_managers cm

where cm.username = '{user}')

and quarterid = current\_user

"""

**cursor**.**execute**(update\_query)

**cursor**.**close**()

def remove\_lock(**year**, **quarter**, **user**, pwd):

con = psycopg2.**connect**(**database** = 'adventureworks21'

, **user** = **user**

, **password** = pwd

, **host** = 'localhost')

con.autocommit = **True**

**cursor** = con.**cursor**()

quarterid = str(**year**) + '.' + str(**quarter**)

update\_query = f"""

update adventureworks21.reports.plan\_status

set status = 'R'

, modifieddatetime = now()::timestamp

, author = current\_user

where country in (select cm.country

from adventureworks21.reports.country\_managers cm

where cm.username = current\_user)

and quarterid = '{quarterid}'

"""

**cursor**.**execute**(update\_query)

**cursor**.**close**()

*set\_lock(2014, 1, 'sophie')*

*set\_lock(2014, 1, ‘kirill’)*

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*Task №8. Plan data approval*

def accept\_plan(**year**, **quarter**, **user**, pwd):

con = psycopg2.**connect**(**database** = 'adventureworks21'

, **user** = **user**

, **password** = pwd

, **host** = 'localhost')

con.autocommit = **True**

**cursor** = con.**cursor**()

quarterid = str(**year**) + '.' + str(**quarter**)

delete\_query = f"""

delete

from adventureworks21.reports.plan\_data pd

where pd.versionid = 'A'

and pd.quarterid = '{quarterid}'

and pd.country in (

select cm.country

from adventureworks21.reports.country\_managers cm

where cm.username = current\_user

)

"""

**cursor**.**execute**(delete\_query)

insert\_query = f"""

insert into adventureworks21.reports.plan\_data

select 'A'

, pd.country

, pd.quarterid

, pd.pcid

, pd.salesamt

from adventureworks21.reports.plan\_data pd

join adventureworks21.reports.plan\_status ps

on ps.country = pd.country

and ps.status = 'R'

join adventureworks21.reports.country\_managers cm

on cm.country = ps.country

and cm.username = current\_user

where pd.versionid = 'P'

and pd.quarterid = '{quarterid}'

"""

**cursor**.**execute**(insert\_query)

update\_query = f"""

update adventureworks21.reports.plan\_status

set status = 'A'

, modifieddatetime = now()::timestamp

where quarterid = '{quarterid}'

and country in (

select cm.country

from adventureworks21.reports.country\_managers cm

where cm.username = current\_user

)

"""

**cursor**.**execute**(update\_query)

**cursor**.**close**()

*accept\_plan (2014, 1, 'sophie')*

*accept\_plan(2014, 1, ‘kirill’)*

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*Task No9. Data preparation for plan-fact analysis in Q1 2014*

*I chose the first approach*

**create** **materialized** **view** mv\_plan\_fact\_2014\_q1 **as**

**select** t.quarterid

, **string\_agg**(**distinct** t.country ::**character** **varying**, ', ') **as** country

, **string\_agg**(**distinct** t.categoryname ::**character** **varying**, ', ') **as** categoryname

, **string\_agg**(t.dev ::**character** **varying**, ', ') **as** dev

, **string\_agg**(t.dev\_prc ::**character** **varying**, ', ') **as** dev\_prc

**from**

(

**select** pd.quarterid

, pd.country

, p."name" **as** categoryname

, **sum**(pd.salesamt) - **sum**(**coalesce**(cs.salesamt, 0)) **as** dev

, **round**((**sum**(pd.salesamt) - **sum**(**coalesce**(cs.salesamt, 0)))/**sum**(pd.salesamt) \* 100, 0) **as** dev\_prc

**from** adventureworks21.reports.plan\_data pd

**join** adventureworks21.public.productcategory p

**on** pd.pcid = p.productcategoryid

**left** **join** (

**select** cs.qr **as** quarterid

, cs.categoryid **as** pcid

, c.countrycode **as** country

, **sum**(cs.salesamt) **as** salesamt

**from** adventureworks21.reports.company\_sales cs

**join** adventureworks21.reports.company c

**on** c.id = cs.cid

**where** cs.ccls **in** ('A', 'B')

**group** **by** 1, 2, 3

) cs

**on** cs.pcid = pd.pcid

**and** cs.quarterid = pd.quarterid

**and** cs.country = pd.country

**where** pd.versionid = 'A'

**and** pd.quarterid = '2014.1'

**group** **by** 1, 2, 3

**order** **by** 1, 2

) **as** t

**group** **by** 1

**with** **data**

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