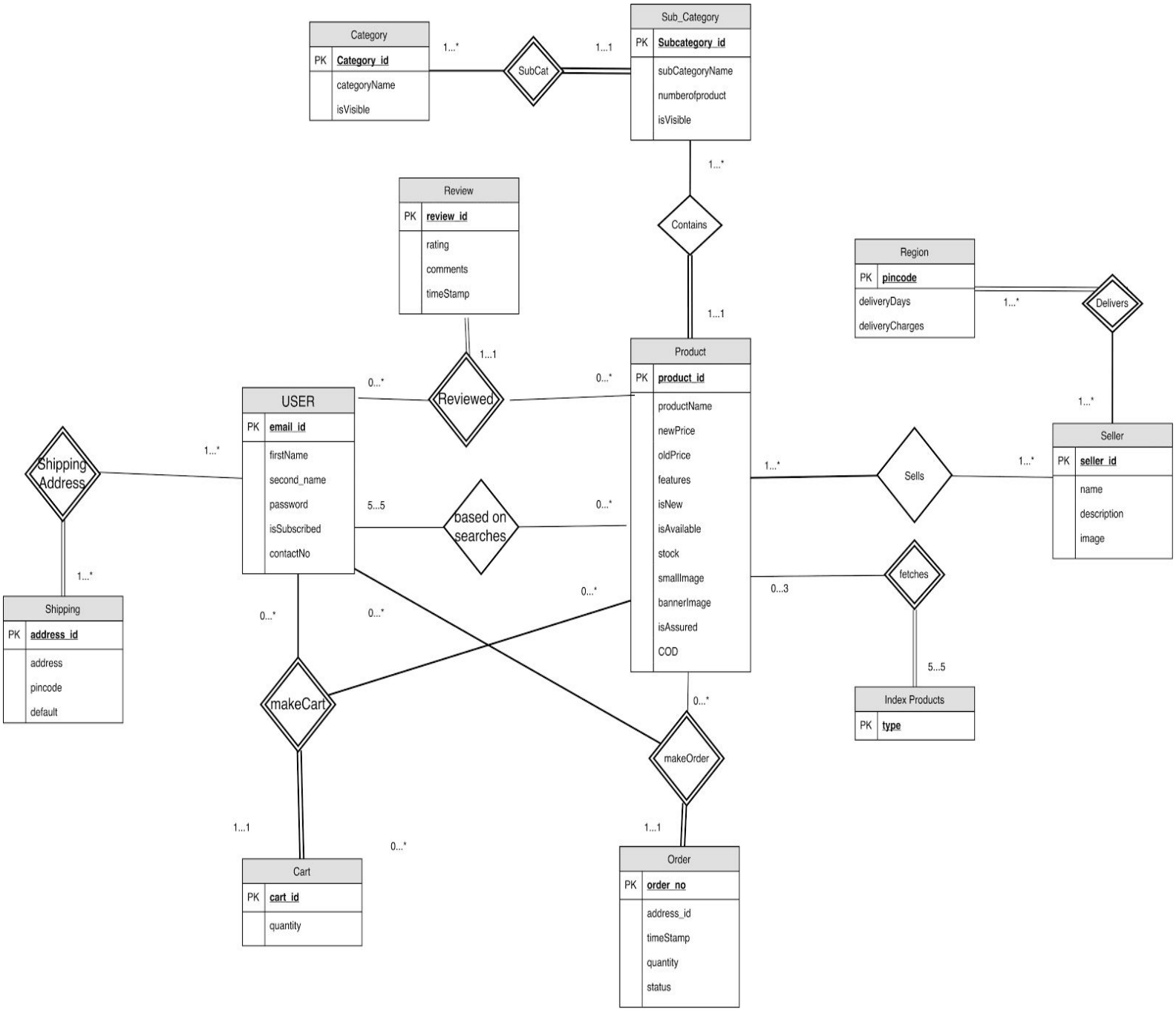
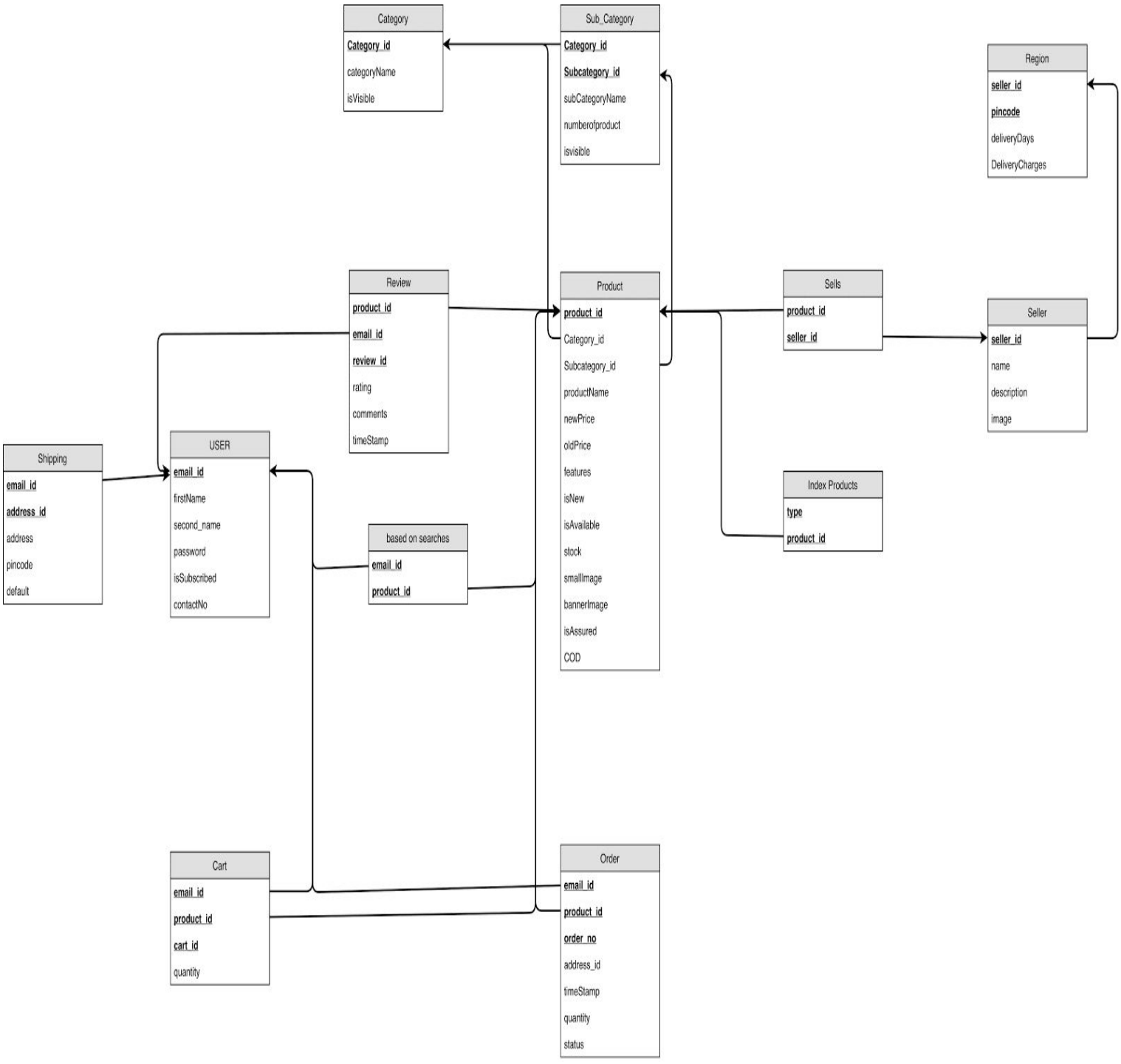
Report Of DataBase Structure

E-R Diagram



Link:- ClassroomShoppers/dataStructureDocumentation/mockShoppersERD.pdf

Relational Schema



Link :- ClassroomShoppers/dataStructureDocumentation/mockShopperSchema.pdf

ATTRIBUTES AND NOTATION

Attribute	Notation
Category_id	A
categoryName	B
isVisible	C
Subcategory_id	D
SubCategoryName	E
numberofproducts	F
isVisible	G
product_id	H
productName	I
newPrice	J
oldPrice	K
features	L
isNew	M
isAvailaible	N
stock	O
COD	P
isAssured	Q
smallImage	R
bannerImage	S
isAssured	Q
seller_id	T
seller.name	U
description	V

image	W
pincode	X
deliveryDays	Y
deliveryCharges	Z
firstName	a
second_Name	b
email_id	c
password	d
isSubcribed	e
contactNo	f
addess_id	g
address	h
pincode	i
default	j
review_id	k
review.timeStamp	l
rating	m
comments	n
cart_id	o
cart.quantity	p
order_no	q
address_id	r
order.timeStamp	s
order.quantity	t
status	u
type	v

Functional Dependencies of tables:

For Category table
A->BC
B->AC
Candidate Keys: A,B

For Sub_category table
AD->EFG
BD->EFG
AE->DFG
BE->DFG
Candidate Keys: AD, BD, AE, BE.

For Product table
H->IJKLMNOPQRS
Candidate Keys: H

For Seller
T->UVW
Candidate Keys:T

For Region table
TX->YZ
Candidate keys: T,X

For USER table
c->abdef
Candidate Keys: c

For Shipping table
cg->hi
h->i
Candidate Keys: cg

For Review table
cHl->kmn
cHk->lmn
Candidate Keys: cHl,cHk

For Cart table
cHo->p
Candidate Keys: cHo

For Order table
cHq->rstu
cHs->qrtu
Candidate Keys: cHq, cHs.

Steps for finding minimal cover of these dependencies:

Step 1: Decomposing RHS:

A->B
A->C
B->A
B->C
AD->E
AD->F
AD->G
BD->E
BD->F
BD->G
AE->D
AE->F
AE->G
BE->D
BE->F
BE->G
H->I
H->J
H->K
H->L
H->M
H->N
H->O
H->P
H->Q
H->R
H->S
T->U
T->V
T->W
TX->Y
TX->Z
c->a

c->b
c->d
c->e
c->f
cg->h
cg->i
cg->j
h->i
cHl->k
cHl->m
cHl->n
cHk->l
cHk->m
cHk->n
cHo->p
cHq->r
cHq->s
cHq->t
cHq->u
cHs->r
cHs->q
cHs->t
cHs->u

Step 2: Cancelling redundant dependencies.Cancelled dependencies are:

A->C
AD->E
AD->F
AD->G
BD->F
BD->G
AE->D
AE->F
AE->G
cg->i
cHl->m
cHl->n
cHq->r
cHq->t
cHq->u

Step 3: Checking left side of the dependencies if they can be reduced.
Dependencies that are reduced :

BD->E to B->E
cHl->k to cH->k
cHk->l to cH->l
cHk->m to cH->m
cHk->n to cH->n
cHq->s to cH->s
cHs->q to cH->q
cHs->r to cH->r
cHs->t to cH->t
cHs->u to cH->u

Therefore final minimal cover:

A->B
B->ACE
BE->DFG
H->IJKLMNOPQRS
T->UVW
TX->YZ
c->abdef
cg->hj
h->i
cH->klmnqrstu
cHo->p

TABLES:

Category(A,B,C)
Sub_category(A,D,E,F,G)
Product(H,I,J,K,L,M,N,O,P,Q,R,S)
Seller(T,U,V,W)
Region(T,X,Y,Z)
Sells(T,H)
User(a,b,c,d,e,f)
Shipping(c,g,h,i,j)
Review(c,H,k,l,n,m)
Cart(c,H,o,p)
Order(c,H,q,r,s,t,u)
basedOnSearches(c,H)
indexProduct(v,H)

Final functional dependecies:

A->B
B->ACE
BE->DFG
H->IJKLMNOPQRS
T->UVW
TX->YZ
c->abdef
cg->hj
h->i
cH->klmnqrstu
cHo->p

Prime Attributes: A,B,D,E,H,T,U,V,W,X,c,g,l,k,o,q,s
Non Prime Attributes: C,F,G,I,J,K,L,M,N,O,P,Q,R,S,Y,Z,a,b,d,e,f,h,i,j,m,n,p,r,t,u,v

Normalization of tables:

1NF normalisation

All the above given tables are already in 1NF, because all are in atomic form.

2NF normalisation

All the tables are already in 2NF because there is no partial dependencies among FDs.

3NF normalisation

There is transitive dependency in table **Shipping(c,g,h,i,j)**

cg->h,

h->i (both h and i are non-prime attribute so it is transitive dependency)

So we decompose this table as.,
Shipping_address(c,g,h,j)
address_pincode(h,i)

All others Tables are already in 3NF because there is no transitive dependency.

After decomposition 3NF forms of all tables are:

Category(A,B,C)
Sub_category(A,D,E,F,G)
Product(H,I,J,K,L,M,N,O,P,Q,R,S)
Seller(T,U,V,W)
Region(T,X,Y,Z)
Sells(T,H)
User(a,b,c,d,e,f)
Shipping_address(c,g,h,j)
address_pincode(h,i)
Review(c,H,k,l,n,m)
Cart(c,H,o,p)
Order(c,H,q,r,s,t,u)
basedOnSearches(c,H)
indexProduct(v,H)

BCNF Normalisation

All the new formed tables are in BCNF because the left side of the dependencies of all the tables are superkeys.

Since there is no multi-valued dependency and join dependency, so the given tables are already in 5NF.

So, final tables are:

Category(A,B,C)
Sub_category(A,D,E,F,G)
Product(H,I,J,K,L,M,N,O,P,Q,R,S)
Seller(T,U,V,W)
Region(T,X,Y,Z)
Sells(T,H)
User(a,b,c,d,e,f)
Shipping_address(c,g,h,j)
address_pincode(h,i)
Review(c,H,k,l,n,m)
Cart(c,H,o,p)
Order(c,H,q,r,s,t,u)
basedOnSearches(c,H)
indexProduct(v,H)