

# CPSC 304 Project Cover Page

Milestone #: 2

Date: October 20<sup>th</sup> 2022

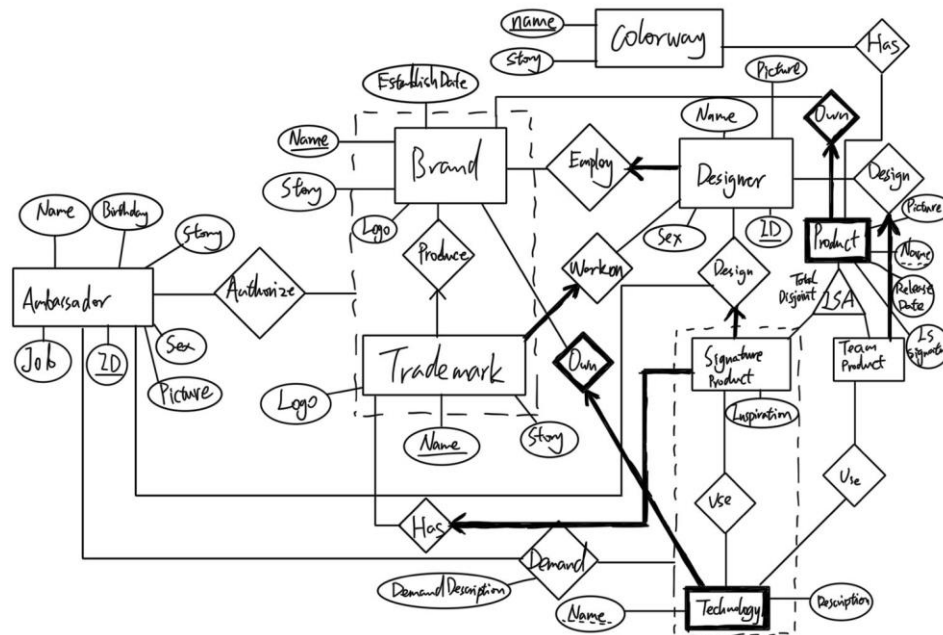
Group Number: 98

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By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above. (In the case of Project Milestone 0, the main purpose of this page is for you to let us know your e-mail address, and then let us assign you to a TA for your project supervisor.)

In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia

## ER Diagram



Comparing to our milestone 1 we have made some changes to the ER diagram based on the feedback we got. Added Entity Colorway, changed Technology. Name's underline to dashed line (weak entity), added Inspiration for SignatureProduct, moved Name attribute of SignatureProduct and TeamProduct under Product, added ReleaseDate attribute for Product.

**Note: For the following pages we have listed out: each relational scheme, the corresponding functional dependencies(And their normalization), SQL DDL, Table demonstration of queries that may be added into the tables of relation.**

## [BRAND]

### *Schema*

Brand(Name: char[20], EstablishDate: int, Story: char[2000], Logo: char[2048])

### *Functional dependency*

Name -> EstablishDate, Story, Logo

### *SQL DDL statment*

```
CREATE TABLE Brand (  
    Name CHAR[20] PRIMARY KEY,  
    EstablishDate INT,  
    Story CHAR[2000],  
    Logo CHAR[2048]  
)
```

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Table: Brand

Name	EstablishDate	Story	Logo
"Nike"	19640125	"The company was founded on January 25, 1964, as "Blue Ribbon Sports", by <a href="#">Bill Bowerman</a> and <a href="#">Phil Knight</a> , and officially became Nike, Inc. on May 30, 1971. The company takes its name from <a href="#">Nike</a> , the Greek goddess of victory. Nike markets its products under its own brand, as well as Nike Golf, Nike Pro, <a href="#">Nike+</a> , <a href="#">Air Jordan</a> , <a href="#">Nike Blazers</a> , <a href="#">Air Force 1</a> , Nike Dunk, <a href="#">Air Max</a> , Foamposite, <a href="#">Nike Skateboarding</a> , Nike CR7, and subsidiaries including <a href="#">Jordan Brand</a> and <a href="#">Converse</a> . Nike also owned Bauer Hockey from 1995 to 2008, and previously owned <a href="#">Cole Haan</a> , <a href="#">Umbro</a> , and <a href="#">Hurley International</a> . In addition to manufacturing sportswear and equipment, the company operates retail stores under the Niketown name. Nike sponsors many high-profile athletes and sports teams around the world, with the highly recognized trademarks of "Just Do It" and the <a href="#">Swoosh</a> logo."	<url>
"Adidas"	19490818	"Adidas is a <a href="#">German multinational corporation</a> , founded and headquartered in <a href="#">Herzogenaurach, Bavaria</a> , that designs and manufactures shoes, clothing and accessories. It is the largest <a href="#">sportswear</a> manufacturer in <a href="#">Europe</a> , and the second largest in the world, after <a href="#">Nike</a> . The company was started by <a href="#">Adolf Dassler</a> in his mother's house; he was joined by his elder brother <a href="#">Rudolf</a> in 1924 under the name <a href="#">Gebrüder Dassler Schuhfabrik</a> ("Dassler Brothers Shoe Factory"). Dassler assisted in the development of spiked running shoes ( <a href="#">spikes</a> ) for multiple athletic events. To enhance the quality of spiked athletic footwear, he transitioned from a previous model of heavy metal spikes to utilising canvas and rubber. Dassler persuaded U.S. sprinter <a href="#">Jesse Owens</a> to use his handmade spikes at the <a href="#">1936 Summer Olympics</a> . In 1949, following a breakdown in the relationship between the brothers, Adolf created Adidas and Rudolf established <a href="#">Puma</a> , which became Adidas's business rival. The <a href="#">three stripes</a> are Adidas's identity mark, having been used on the company's clothing and shoe designs as a marketing aid.	<Url>
"Air Jordan"	19841117	" <a href="#">Air Jordan</a> is a line of basketball shoes and athletic clothing produced by American corporation <a href="#">Nike</a> . The first Air Jordan shoe was produced for <a href="#">Hall of Fame</a> former basketball player <a href="#">Michael Jordan</a> during his time with the <a href="#">Chicago Bulls</a> in late 1984 and released to the public on April 1, 1985. The shoes were designed for Nike by <a href="#">Peter Moore</a> , <a href="#">Tinker Hatfield</a> , and Bruce Kilgore."	
"Li-Ning"	19900000	" <a href="#">Li-Ning Company Limited</a> is a Chinese <a href="#">sportswear</a> and <a href="#">sports equipment</a> company founded by former Olympic gymnast <a href="#">Li Ning</a> . The company endorses a number of athletes and teams worldwide."	
"Puma"	19840000	" <a href="#">Puma SE</a> , branded as <a href="#">Puma</a> , is a German <a href="#">multinational corporation</a> that designs and manufactures athletic and casual footwear, apparel and accessories, which is headquartered in <a href="#">Herzogenaurach, Bavaria, Germany</a> . Puma is the third largest <a href="#">sportswear</a> manufacturer in the world. The company was founded in 1948 by <a href="#">Rudolf</a>	

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		<p><a href="#">Dassler</a>. In 1924, Rudolf and his brother <a href="#">Adolf "Adi" Dassler</a> had jointly formed the company <i>Gebrüder Dassler Schuhfabrik</i> (Dassler Brothers Shoe Factory). The relationship between the two brothers deteriorated until the two agreed to split in 1948, forming two separate entities, <a href="#">Adidas</a> and Puma. Following the split, Rudolf originally registered the newly established company as <i>Ruda</i> (derived from <b>Rudolf Dassler</b>, as Adidas was based on Adi Dassler), but later changed the name to <i>Puma</i>. Puma's earliest logo consisted of a square and beast jumping through a <i>D</i>, which was registered, along with the company's name, in 1948. Puma's shoe and clothing designs feature the Puma logo and the distinctive "Formstrip" which was introduced in 1958."</p>	
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## [TRADEMARK]

### *Schema*

Trademark(Name: char[50], Story: char[2000], Logo: char[2048], **DesignerID: int**, **BrandName: char[20]**)

### *Functional Dependency*

FD: Name -> Story, Logo, DesignerID, BrandName

### *SQL DDL Statement*

```
CREATE TABLE Trademark (  
    BrandName CHAR[20],  
    Name CHAR[50] PRIMARY KEY,  
    Story CHAR[2000],  
    Logo CHAR[2048],  
    DesignerID INT NOT NULL,  
    FOREIGN KEY (DesignerID) REFERENCES Designer(ID) ON DELETE NO ACTION, ON  
    UPDATE CASCADE,  
    FOREIGN KEY (BrandName) REFERENCES Brand(Name)  
)
```

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Table: TradeMark

Name	Story	Logo	BrandName	DesignerID
"Air Jordan"	" <b>Air Jordan</b> is a line of basketball shoes and athletic clothing produced by American corporation <a href="#">Nike</a> . The first Air Jordan shoe was produced for <a href="#">Hall of Fame</a> former basketball player <a href="#">Michael Jordan</a> during his time with the <a href="#">Chicago Bulls</a> in late 1984 and released to the public on April 1, 1985. The shoes were designed for Nike by <a href="#">Peter Moore</a> , <a href="#">Tinker Hatfield</a> , and Bruce Kilgore."	<url>	"Air Jordan"	1
"Kobe Signature"	"In 2003 the official logotype for the Nike collection was introduced, and this symbol became truly iconic and recognizable across the globe, staying a symbol of the sport's legend till the end. The Kobe Bryant logo is composed of an abstract geometric symbol, consisting of six segments, which make up a figure, resembling a sword. Though its official color palette is monochrome, the emblem can be seen in different combinations, depending on the needs and background. Their strictness of the lines and unusual shape of the emblem gives endless opportunities to stylize it, it looks sharp and serious in 2D, when drawn in white on a black background, and sleek and futuristic when used with a three-dimensional effect."	<url>	"Nike"	2
"Lebron Signature 2003-2011"	"The first shoe, called Air Zoom Generation, was created in 2003. On it, you could see the original LeBron James logo. It consisted of two parts: a small crown at the bottom left corner and an intricate symbol, representing the athlete's interlacing initials."	<url>	"Nike"	3
"Lebron Signature 2011-Now"	"The current logo is a lockup consisting of an "L" with a "J" joined by a crown, which was taken from the previous logo. The negative spaces are supposed to resemble a basketball court key."	<url>	"Nike"	4
"Adidas Yeezy"	" <b>Adidas Yeezy</b> is a fashion collaboration between German sportswear company <a href="#">Adidas</a> and American rapper, designer, entrepreneur and personality <a href="#">Kanye West</a> . The collaboration has become notable for its high-end limited edition <a href="#">colorways</a> and general releases offered by the Yeezy Boost <a href="#">sneakers</a> lineup. The collaboration has also produced shirts, jackets, track pants, socks, slides, women's shoes, lingerie and slippers. The first shoe model ("Boost 750") was released in February 2015."	<url>	"Adidas"	5

## [Ambassador]

### *Schema*

Ambassador(ID: int, Name: char[50], Job: char[50], Birthday: int, Story: char[2000], Sex: char[1],  
Picture: char[2048])

### *Functional Dependency*

FD: ID -> Name, Job, Birthday, Story, Sex, Picture

### *SQL DDL Statement*

```
CREATE TABLE Ambassador (  
    ID INT PRIMARY KEY,  
    Name CHAR[50],  
    Job CHAR[50],  
    Birthday INT,  
    Story CHAR[2000],  
    Sex CHAR[1],  
    Picture CHAR[2048]  
)
```



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Table: Ambassador

ID	Name	Job	Birthday	Story	Sex	Puicture
1	"Kobe Bryant"	"NBA Player"	19780823	" <b>Kobe Bean Bryant</b> was an American professional <a href="#">basketball</a> player. A shooting guard, he <a href="#">spent his entire 20-year career</a> with the <a href="#">Los Angeles Lakers</a> in the National Basketball Association (NBA). Widely regarded as one of the greatest basketball players of all time, Bryant won five NBA championships, was an 18-time <a href="#">All-Star</a> , a 15-time member of the <a href="#">All-NBA Team</a> , a 12-time member of the <a href="#">All-Defensive Team</a> , the 2008 <a href="#">NBA Most Valuable Player</a> (MVP), and a two-time <a href="#">NBA Finals MVP</a> . Bryant also <a href="#">led the NBA in scoring</a> twice, and ranks fourth in <a href="#">league all-time regular season</a> and <a href="#">postseason scoring</a> . He was posthumously voted into the <a href="#">Naismith Memorial Basketball Hall of Fame</a> in 2020 and named to the <a href="#">NBA 75th Anniversary Team</a> in 2021. Kobe died in a helicopter accident on January 26 <sup>th</sup> 2020."	"M"	<url>
2	"Lebron James"	"NBA Player"	19841230	" <b>LeBron Raymone James Sr.</b> is an American professional <a href="#">basketball</a> player for the <a href="#">Los Angeles Lakers</a> of the <a href="#">National Basketball Association</a> (NBA). Nicknamed " <b>King James</b> ", he is widely considered one of the greatest players ever and is often compared to <a href="#">Michael Jordan</a> in debates over the greatest basketball player of all time. James has won four <a href="#">NBA championships</a> , four <a href="#">NBA MVP</a> awards, four <a href="#">NBA Finals MVP</a> awards, three <a href="#">All-Star MVP</a> awards, and two <a href="#">Olympic gold medals</a> . James has scored the most points in the playoffs, the most career points (playoffs and regular seasons combined), the second most regular seasons points, and has the seventh most career assists. He has been selected an <a href="#">NBA All-Star</a> 18 times, to the <a href="#">All-NBA Team</a> a record 18 times, and to the <a href="#">NBA All-Defensive First Team</a> five times. He has competed in ten <a href="#">NBA Finals</a> , the third most all time, including eight consecutively between 2011 and 2018. In 2021, James was selected to the <a href="#">NBA 75th Anniversary Team</a> , and in 2022 became the first player in NBA history to accumulate 10,000 or more career points, rebounds, and assists."	"M"	
3	"Michael Jordan"	"NBA Player"	19630217	" <b>Michael Jeffrey Jordan</b> also known by his initials <b>MJ</b> , is an American businessman and former professional <a href="#">basketball</a> player. His biography on the official NBA website states: "By acclamation, Michael Jordan is the greatest basketball player of all time." He played fifteen seasons in the <a href="#">National Basketball Association</a> (NBA), winning six <a href="#">NBA championships</a> with the <a href="#">Chicago Bulls</a> . Jordan is the principal owner and chairman of the <a href="#">Charlotte Hornets</a> of the NBA and of <a href="#">23XI Racing</a> in the <a href="#">NASCAR Cup Series</a> . He was integral in popularizing the NBA around the world in the 1980s and 1990s, becoming a global <a href="#">cultural icon</a> in the process."	"M"	
4	"Damian Lillard"	"NBA Player"	19900715	" <b>Damian Lamonte Ollie Lillard Sr.</b> is an American professional <a href="#">basketball</a> player for the <a href="#">Portland Trail Blazers</a> of the <a href="#">National Basketball Association</a> (NBA). He played <a href="#">college basketball</a> for the <a href="#">Weber State Wildcats</a> and earned third-team <a href="#">All-American</a> honors in 2012. After being selected by Portland with the sixth overall pick in the <a href="#">2012 NBA draft</a> , Lillard was unanimously voted the <a href="#">NBA Rookie of the Year</a> . Nicknamed "Dame Time" for his history of making big shots in the clutch, he has received six <a href="#">NBA All-Star</a> and <a href="#">All-NBA Team</a> selections, the only player in Trail Blazers franchise history to do so. In October 2021, Lillard was honored as one of the league's greatest players of all time by being named to the <a href="#">NBA 75th Anniversary Team</a> . He also won a gold medal on the <a href="#">2020 U.S. Olympic team</a> in Tokyo."	"M"	
5	"Kanye"	"Designer"	19770608	" <b>Kanye Omari West</b> is an American rapper, singer, songwriter,	"M"	

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	West"			record producer, and fashion designer. He is one of the most critically acclaimed & influential artists of the 21st century, and is regarded as one of the most influential <a href="#">hip hop</a> artists of all time. Designing the most recognized series of 'yeezy' for adidas since 2015."		
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## [AmbassdorAuthorize]

### Schema

AmbassdorAuthorize(**BrandName: char[20]**, **TrademarkName: char[50]**, **AmbassadorID: int**)

### SQL DDL Statement

```
CREATE TABLE AmbassadorAuthorize (  
    BrandName CHAR[20],  
    TrademarkName CHAR[50],  
    AmbassadorID INT,  
    PRIMARY KEY (AmbassadorID, TrademarkName),  
    FOREIGN KEY (BrandName) REFERENCES Brand(Name, EstablishDate, Story),  
    FOREIGN KEY (AmbassadorID) REFERENCES Ambassador(ID),  
    FOREIGN KEY (TrademarkName) REFERENCES Trademark(Name)  
)
```

### Table: AmbassadorAuthorize

BrandName	TrademarkName	AmbassadorID
"Nike"	"Kobe Signature"	1
"Nike"	"Lebron Signature"	2
"Air Jordan"	"Air Jordan"	3
"Adidas"	"Dame"	4
"Adidas"	"Yeezy"	5

## [Designer]

### *Schema*

Designer(ID: int, Sex: char[1], Name: char[50], Picture: char[2048], **Employer: char[20]**)

### *Functional Dependency*

FD: ID -> Sex, Name, Employer, Picture

### *SQL DDL Statement*

```
CREATE TABLE Desginer (  
    ID INT PRIMARY KEY,  
    Sex CHAR[1]  
    Name CHAR[50],  
    Picture CHAR[2048] NOT NULL,  
    Employer CHAR[20] NOT NULL,  
    FOREIGN KEY (Employer) REFERENCES Brand(Name, EstablishDate, Story) ON  
    DELETE DO NOTHING, ON UPDATE CASCADE  
)
```

### *Table:Designer*

ID	Sex	Name	Employer	Picture
1	"M"	"Tinker Hatfield"	"Nike"	<url>
2	"M"	"Eric Avar"	"Nike"	
3	"M"	"Darrin Crescenziwhile"	"Nike"	
4	"M"	"David Creech"	"Nike"	
5	"M"	"Kanye West"	"Adidas"	

## [SignatureProduct]

### *Schema*

SignatureProduct(**BrandName: char[20]**, Name: char[50], Inspiration: char[2000], Picture: char[2048], **TrademarkName: char[50]**, **DesignerID: int**, **AmbassadorID: int**) FD:  
BrandName, Name -> Inspiration, TrademarkName, DesignerID, AmbassadorID, Picture

### *SQL DDL Statement*

```
CREATE TABLE SignatureProduct (  
    BrandName CHAR[20],  
    Name CHAR[50],  
    Inspiration CHAR[2000],  
    Picture CHAR[2048] NOT NULL,  
    TrademarkName CHAR[50] NOT NULL,  
    DesignerID INT NOT NULL,  
    AmbassadorID INT NOT NULL,  
    PRIMARY KEY (BrandName, Name),  
    FOREIGN KEY (BrandName) REFERENCES Brand(Name) ON DELETE CASCADE,  
    FOREIGN KEY (BrandName, Name) REFERENCES Product(BrandName, Name) ON  
DELETE CASCADE,  
    FOREIGN KEY (TrademarkName) REFERENCES Trademark(Name) ON DELETE DO  
NOTHING, ON UPDATE CASCADE,  
    FOREIGN KEY (DesignerID) REFERENCES Designer(ID) ON DELETE DO NOTHING,  
ON UPDATE CASCADE,  
    FOREIGN KEY (AmbassadorID) REFERENCES Ambassador(ID) ON DELETE DO  
NOTHING, ON UPDATE CASCADE  
)
```

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Table: SignatureProduct

BrandName	Name	Inspiration	TrademarkName	DesignerID	AmbassadorID	Picture
"Nike"	"Zoom Kobe 11 Tinker"	"Using old design philosophies taken from the original Air Jordan 3 and 4s, using the combination of retro colorways to create newer product."	"Kobe Signature"	1	1	<url>
"Air Jordan"	"Air Jordan 1 Banned"	"This specific shoe that MJ was wearing was banned by the NBA and Nike had to pay for the fines for each game that MJ wears it."	"Air Jordan"	1	3	
"Air Jordan"	"Air Jordan 4 Royal"	"Luxurious image"	"Air Jordan"	1	3	
"Adidas"	"Yeezy Boost 350 V2 Cream"	"Pure white, clean"	"Adidas Yeezy"	5	5	
"Nike"	"Air Yeezy 2 Red October"	"There's the monochromatic scarlet finish, contrasted only by metallic gold lace tips."	"Air Yeezy"	5	5	

## [SignatureProductUseTechnology]

### *Schema:*

SignatureProductUseTechnology(**BrandName: char[20]**, **ProductName: char[50]**,  
**TechnologyName: char[50]**, **AmbassadorID: int**)

### *Functional Dependency*

FD: BrandName, ProductName -> TechnologyName, AmbassadorID

### *SQL DDL Statement*

```
CREATE TABLE SignatureProductUseTechnology (  
    BrandName CHAR[20],  
    ProductName CHAR[50],  
    TechnologyName CHAR[50],  
    AmbassadorID INT,  
    PRIMARY KEY (BrandName, ProductName),  
    FOREIGN KEY (BrandName) REFERENCES Brand(Name) ON DELETE CASCADE,  
    FOREIGN KEY (BrandName, ProductName) REFERENCES  
SignatureProduct(BrandName, Name),  
    FOREIGN KEY (BrandName, TechnologyName) REFERENCES Technology(BrandName,  
Name),  
    FOREIGN KEY (AmbassadorID) REFERENCES Ambassador(ID)  
)
```

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*Table:SignatureProductUseTechnology*

BrandName	ProductName	TechnologyName	AmbassadorID
"Nike"	"Zoom Kobe 11"	"Zoom Heel"	1
"Nike"	"Kobe 9"	"Lunarlon Fullfoot"	1
"Adidas"	"Yeezy Boost 350"	"Boost Fullfoot"	5
"Air Jordan"	"Air Jordan XXXVI"	"Zoom Air Strobel fullfoot"	3
"Nike"	"Lebron 17"	"Zoom Fullfoot"	2

## [ProductHasColorway]

### *Schema*

ProductHasColorway(BrandName: char[20], ProductName:char[50], ReleaseDate: int, Picture: char[2048], IsSignature: bit, ColorwayName: char[50], ColorwayStory: char[2000])

### *Functional Dependency*

FD: (BrandName, ProductName-> ReleaseDate, Picture, IsSignature) (ColorwarName -> ColorwayStory)

**This relation is not in 3NF or BCNF**

### **Normalization:**

ProductHasColorway(BrandName: char[20], ProductName: char[50], ReleaseDate: int, Picture: char[2048], IsSignature: bit, ColorwayName: char[50], ColorwayStory: char[2000]) ->

Product(**BrandName: char[20]**, Name: char[50], ReleaseDate: int, Picture: char[2048], IsSignature: bit) + R1(**BrandName: char[20]**, **ProductName: char[50]**, ColorwayName: char[50], ColorwayStory: char[2000])

R1(**BrandName: char[20]**, **ProductName: char[50]**, ColorwayName: char[50], ColorwatStory: char[2000]) -> ProductColorway(**BrandName: char[50]**, **ProductName: char[50]**, **ColorwayName: char[50]**) + Colorway(Name: char[50], Story: char[2000])



## Result:

### [Product]

#### Schema:

Product(**BrandName: char[20]**, Name: char[50], ReleaseDate: int, Picture: char[2048],  
IsSignature: bit)

#### Functional Dependency

FD: BrandName, Name -> ReleaseDate, Picture, IsSignature

#### SQL DDL Statement

```
CREATE TABLE Product (  
    BrandName CHAR[20],  
    Name CHAR[50],  
    ReleaseDate INT NOT NULL,  
    Picture CHAR[2048] NOT NULL,  
    IsSignature BIT NOT NULL,  
    PRIMARY KEY (BrandName, Name),  
    FOREIGN KEY (BrandName) REFERENCES Brand(Name) ON DELETE CASCADE  
)
```

#### Table:Product

BrandName	Name	ReleaseDate	Picture	IsSignature
"Nike"	"Zoom Kobe 11"	20160109	<url>	1
"Nike"	"Kobe 9"	20131204		1
"Adidas"	"Dame 1"	20151019		1
"Adidas"	"Yeezy Boost 350 V2"	20170225		1

"Air Jordan"	"Air Jordan 4"	19890213	1	批注 [华然1]: Add TeamProducts
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## [ProductColorway]

### *Schema*

ProductColorway(BrandName: char[20], ProductName: char[50], ColorwayName: char[50])

### *SQL DDL Statement*

```
CREATE TABLE ProductColorWay (  
    BrandName CHAR[20],  
    ProductName CHAR[50],  
    ColorwayName CHAR[50],  
    PRIMARY KEY (BrandName, ProductName, ColorwayName),  
    FOREIGN KEY (BrandName) REFERENCES Brand(Name) ON DELETE CASCADE,  
    FOREIGN KEY (BrandName, ProductName) REFERENCES Product(BrandName, Name),  
    FOREIGN KEY (ColorwayName) REFERENCES Colorway(Name)  
)
```

*Table:ProductColorWay*

BrandName	ProductName	ColorwayName
"Nike"	"Zoom kobe 11"	"Tinker"
"Nike"	"Kobe 9"	"Black History Month"
"Adidas"	"Yeezy Boost 350 V2"	"Zebra"
"Air Jordan"	"Air Jordan IV"	"Comet"
"Nike"	"Air Yeezy 2"	"Red October"

## [Colorway]

### *Schema*

Colorway(Name: char[50], Story: char[2000])

### *Functional Dependencies*

FD: Name -> Story

### *SQL DDL Statement*

```
CREATE TABLE Colorway (  
    Name CHAR[50] PRIMARY KEY,  
    Story CHAR[2000]  
)
```

### *Table:Colorway*

Name	Story
"All Star"	"Colorway designed for NBA All-Star game"
"Black History Month"	"Colorway designed for the annual Black history Month"
"Tinker"	"Specific retro design by famous designer Tinker Hatfield."
"Zebra"	"One of the most iconic black/white colorway for yeezys, higher market price on average."
"Black Cat"	"All black no matter what, from toe to heel the whole shoe must be completely black!"

## TeamProductUseTechnology

### *Schema*

TeamProductUseTechnology(**BrandName: char[20]**, ProductName: char[50],  
TechnologyName: char[50], TechnologyDescription: char[2000], TeamProductName: char[50],  
DesignerID: int)

### *Functional Dependency*

FD: (BrandName, ProductName -> TechnologyName), (BrandName, TechnologyName ->  
TechnologyDescription), (BrandName, TeamProductName -> DesignerID)

**This relation is not in 3NF or BCNF**

### **Normalization:**

TeamProductUseTechnology(**BrandName: char[20]**, ProductName: char[50],  
TechnologyName: char[50], TechnologyDescription: char[2000], TeamProductName: char[50],  
DesignerID: int) -> Technology(**BrandName: char[20]**, Name: char[50], Description: char[2000])  
+ R1(**BrandName: char[20]**, ProductName: char[50], **TechnologyName: char[50]**,  
TeamProductName: char[50], DesignerID: int)

R1(**BrandName: char[20]**, ProductName: char[50], **TechnologyName: char[50]**,  
TeamProductName: char[50], DesignerID: int) -> TeamProductUseTechnology(**BrandName:**  
**char[20]**, **ProductName: char[50]**, **TechnologyName: char[50]**) + TeamProduct(**BrandName:**  
**char[20]**, **Name: char[50]**, DesignerID: int)

**Result:**

**[TeamProductUseTechnology]**

*Schema*

TeamProductUseTechnology(BrandName: char[20], ProductName: char[50],

**TechnologyName: char[50]**)

*Functional Dependency*

FD: BrandName, ProductName -> TechnologyName

*SQL DDL Statement*

```
CREATE TABLE TeamProductUseTechnology (  
    BrandName CHAR[20],  
    ProductName CHAR[50],  
    TechnologyName CHAR[50],  
    BrandName CHAR[20],  
    ProductName CHAR[50],  
    TechnologyName CHAR[50],  
    PRIMARY KEY (BrandName, ProductName),  
    FOREIGN KEY (BrandName) REFERENCES Brand(Name) ON DELETE CASCADE,  
    FOREIGN KEY (BrandName, ProductName) REFERENCES TeamProduct(BrandName,  
Name),  
    FOREIGN KEY (BrandName, TechnologyName) REFERENCES Technology(BrandName,  
Name)  
)
```

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*Table: TeamProductUseTechnology*

BrandName	ProductName	TechnologyName
"Nike"	"Zoom Live 2"	"Zoom Air Forefoot"
"Nike"	"Hyperdunk 2017"	"React Fullfoot"
"Nike"	"Kyrie Flytrap 6"	"Zoom Air Forefoot"
"Adidas"	"Harden Stepback 3"	"Bounce Midsole"
"Adidas"	"Dame Extply 2.0"	"Bounce Midsole"

## [Technology]

### *Schema*

Technology(BrandName: char[20], Name: char[50], Description: char[2000])

### *Functional Dependency*

FD: BrandName, Name -> Description

### *SQL DDL Statement*

```
CREATE TABLE Technology (  
    BrandName CHAR[20],  
    Name CHAR[50],  
    Description CHAR[2000],  
    PRIMARY KEY (BrandName, Name),  
    FOREIGN KEY (BrandName) REFERENCES Brand(Name) ON DELETE CASCADE  
)
```

### *Table: Technology*

BrandName	Name	Description
"Nike"	"Zoom"	"Air insole with knit inside to designed for speed and agility, tighly stretched fibers absorbs impact and then snap back to fast movement and reduced stress on muscles."
"Nike"	"Zoom Forefoot"	"Zoom air insole but only for a fraction of the fore foot, different too full foot zoom."
"Nike"	"React"	"Seriously Durable and soft support, "rocker" shape for more response."
"Adidas"	"Boost"	"BOOST midsole for endless energy, with a Linear Energy Push system, The pellets consist of proprietary thermoplastic urethane (TPU) that is formed into a small pill shape."
"Air Jordan"	"Zoom Air Strobel fullfoot"	"Variant version of the Nike Zoom, which is designed with higher tension and faster bounce back specifically for high performance in Basketball."



## [TeamProduct]

### *Schema*

TeamProduct(**BrandName: char[20]**, **Name: char[50]**, DesignerID: int)

### *Functional Dependency*

FD: BrandName, Name -> DesignerID

### *SQL DDL Statement*

```
CREATE TABLE TeamProduct (  
    BrandName CHAR[20],  
    Name CHAR[50],  
    DesignerID INT NOT NULL,  
    PRIMARY KEY (BrandName, Name),  
    FOREIGN KEY (BrandName) REFERENCES Brand(Name) ON DELETE CASCADE,  
    FOREIGN KEY (BrandName, Name) REFERENCES Product(BrandName, Name) ON  
DELETE CASCADE,  
    FOREIGN KEY (DesignerID) REFERENCES Designer(ID) ON DELETE DO NOTHING,  
ON UPDATE CASCADE  
)
```

### *Table: TeamProduct*

BrandName	Name	DesignerID
"Nike"	"Zoom Live 2"	2
"Nike"	"Hyperdunk 2017"	2
"Nike"	"Kyrie Flytrap 6"	3
"Nike"	"Hyperdunk 2018"	4
"Air Jordan"	"Jordan One Take 4"	1

## AmbassadorDemandTechUse

### Schema

AmbassadorDemandTechUse(**BrandName: char[20]**, **TechnologyName: char[50]**,  
**SignatureProductName: char[50]**, **AmbassadorID: int**)

### SQL DDL Statement

```
CREATE TABLE AmbassadorDemandTechUse (  
    BrandName CHAR[20],  
    TechnologyName CHAR[50],  
    SPName: CHAR[50],  
    AmbassadorID: INT,  
    DemandDescription: CHAR[2000],  
    PRIMARY KEY (BrandName, TechnologyName, SPName, AmbassadorID),  
    FOREIGN KEY (BrandName) REFERENCES Brand(Name) ON DELETE CASCADE,  
    FOREIGN KEY (BrandName, SPName) REFERENCES SignatureProduct(BrandName,  
Name)  
    FOREIGN KEY (AmbassadorID) REFERENCES Ambassador(ID)  
    FOREIGN KEY (BrandName, TechnologyName) REFERENCES Technology(BrandName,  
Name)  
)
```

Table: AmbassadorDemandTechUse

BrandName	TechnologyName	SignatureProductName	AmbassadorID
"Nike"	"Zoom Heels"	"Zoom Kobe 11"	1
"Nike"	"Lunarlon fullfoot"	"Zoom Kobe 9"	1
"Nike"	"Zoom Fullfoot"	"Lebron 17"	2
"Adidas"	"Boost"	"Yeezy Boost 350 V2"	5
"Air Jordan"	"Zoom Air Strobel fullfoot"	"Air Jordan XXXVI	3