

# NBA Top Shot Database



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## Part 1

### Overview

NBA Top Shot is a digital collectable experience that leverages the power of the good ol' internet and the new innovative technology called blockchain to deliver the next generation of the collectables and marketplace experience that was established with trading cards. NBA Top Shot uses blockchain technology to create assets that are guaranteed limited edition and authentic, where users are able to buy "Packs" that contain "Moments," and those Moments are snippets of Sets that amount to a specific number. For example, a user can buy an Early Adopter Pack that Contains 5 total Moments (2 from the Early Adopters set and 3 from the Base Set), a user can continue to buy Early Adopter packs to collect all 10 Early Adopter Moments, or they can purchase these Moments from the Marketplace.

The Goal is to complete as many Sets as possible by purchasing Packs or buying the individual Moments contained in these Packs through the Marketplace, however, certain Packs are sold at a very limited number, and once those packs are sold out the only way to purchase Moments to complete Sets is to buy them in the Marketplace.

In Phase 1, we will be defining the NBA Topshot in terms of the entities and relationships by determining the business rules, providing a data glossary, identifying the questions we would like to answer and demonstrating both a conceptual and logical model of the NBA TopShot database.

## Stakeholders

- The NBA
- Investors
- Dapper Labs employees
- NBA Top Shot users
- Potential future businesses that hold collectible IP

The stakeholders included in this project are the investors, the NBA Licensing commission, the employees, users, and other potential leagues that would want to replicate this structure. If this Marketplace and user base can be scaled to a market equivalent to the physical NBA trading card marketplace, we will be able to replicate this model with other potential leagues by licensing their Intellectual Property (IP) to create the biggest online trading marketplace leveraging blockchain technology.

## Business Rules

- A user owns none or many Moments
- A User can buy one or more packs
- A User can have one or many showcases
- A User must have a username
- The marketplace contains many Moments
- A Pack contains one or more Moments
- A Moment has only one Edition Number
- A Moment has one Size
- A Moment must have Player Stats
- A User create a Collection
- A user may have one or more Showcases
- A User may purchase one or more Packs
- Packs are limited to a certain quantity
- There are more than one types of Packs

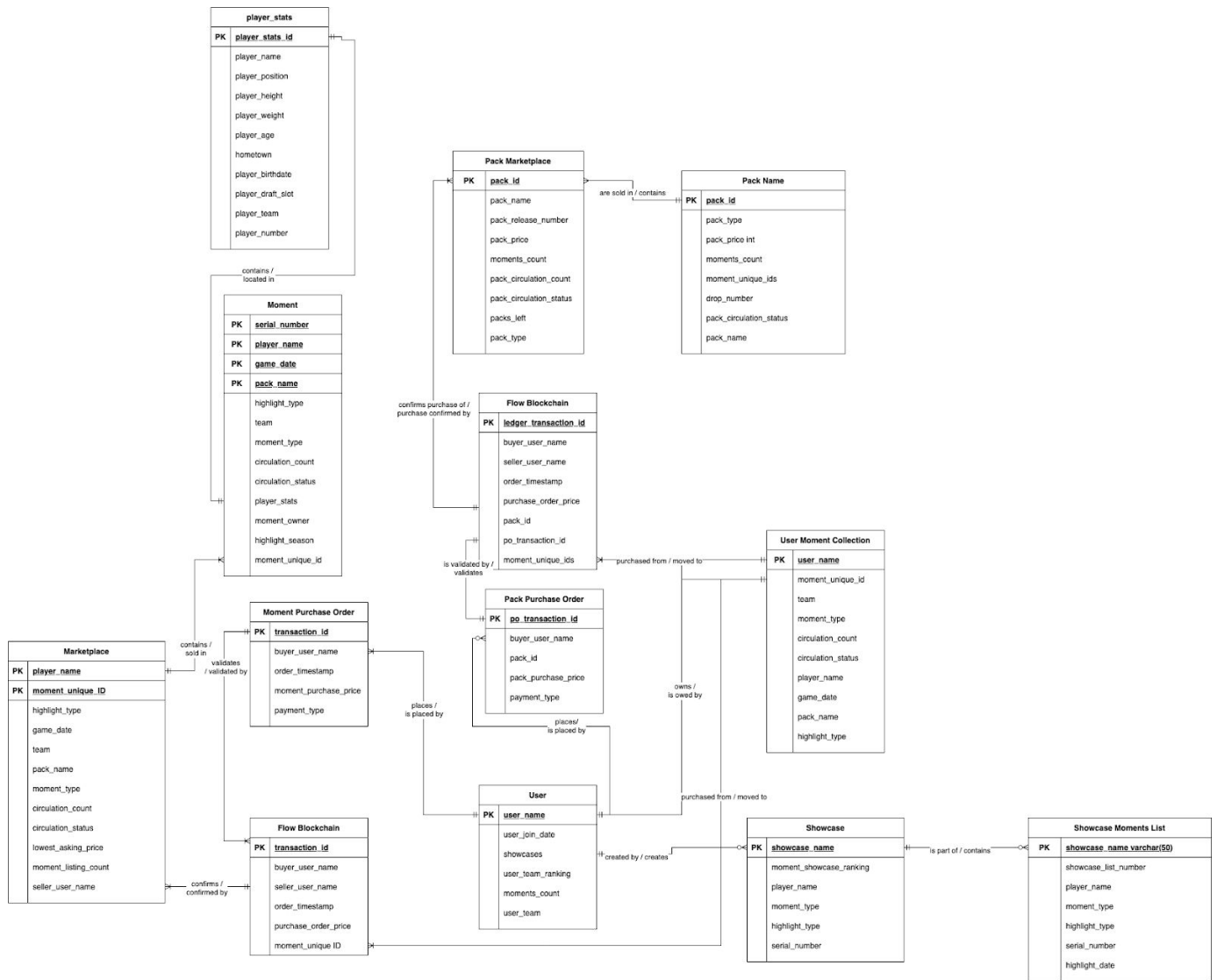
# Glossary

1. **User:** A person who can collect, buy, sell, and trade Moments or Packs
2. **Moment:** A digital collectible, in the form of an NBA video highlight minted on the blockchain. There are 4 different types of Moments: Common, Rare, Legendary, and Ultimate. Each Moment has a fixed circulation from 1-2xxx.
3. **Player Stats:** A collection of information about the player featured in the Moment
4. **Edition Number:** Each Moment has an ID number from 1-2xxx, this specific number is called the edition number
5. **Size:** Each Moment has a fixed circulation from 1-2xxx, the amount of circulation per Moment is the Size, the lower the Size of a Moment the rarer the Moment is
6. **Set:** Sets are a collection of Moments that revolve around a certain theme or event surrounding the NBA. Each set has a fixed number of Moments that are sold in Packs
7. **Packs:** Digital collection of a variable amount Moments that can be purchased.
8. **Showcases:** A digital shelf where users can pick certain Moments they would like to share or show off with other users.
9. **Marketplace:** Location where users can buy and sell Moments to each other.
10. **Collection:** A library of Moments currently owned by a User

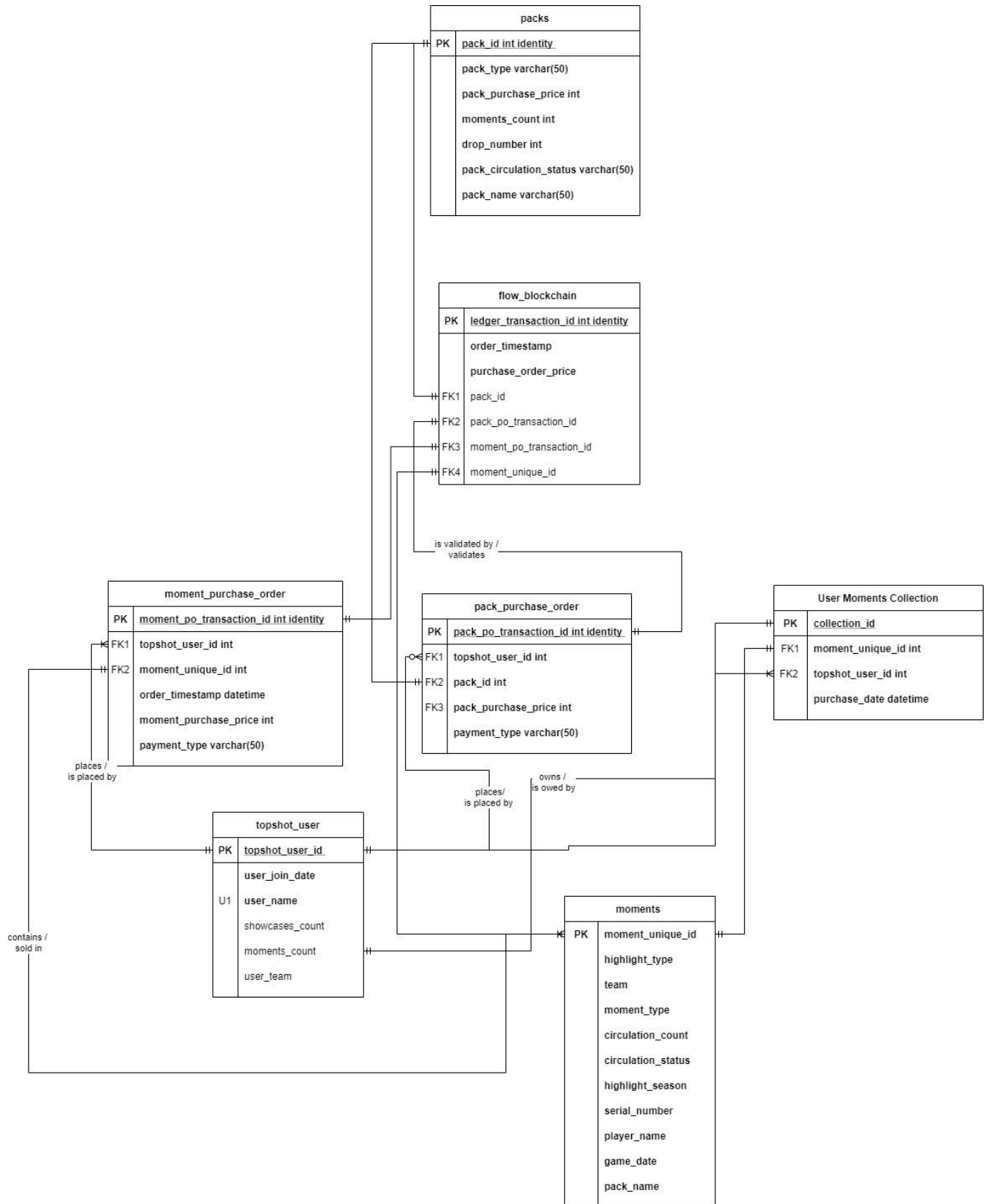
## Data Questions

- From the most recent pack purchase order transactions, what pack was the best selling?
- From most recent moment order transactions, who spent the most money and how much?
- From most recent moment order transactions, who spent the most money and how much?
- From our most recent moment purchases, what was the average transaction per moment type by each user?
- What was the most popular payment type from the most recent transactions?

# Conceptual Model



# Logical Model



# Physical Database Design

```
select 'hello, sql' as greeting
```

--creating the user table

```
CREATE TABLE topshot_user(  
    --create cols  
    topshot_user_id int identity  
    , topshot_username varchar(50) NOT NULL  
    , user_join_date datetime NOT NULL  
    , showcases_count int  
    , moments_count int  
    , user_team varchar(50)  
    --place constraints  
    , CONSTRAINT PK_topshot_user PRIMARY KEY (topshot_user_id)  
    , CONSTRAINT U1_topshot_user UNIQUE(topshot_username)  
)  
-- End Creating the User table
```

--Creating Moments table

```
CREATE TABLE moments(  
    --create cols  
    moment_unique_id int identity  
    , serial_number int NOT NULL  
    , player_name varchar(200) NOT NULL  
    , game_date datetime NOT NULL  
    , pack_name varchar(100) NOT NULL  
    , highlight_type varchar(100) NOT NULL  
    , moment_type varchar(100) NOT NULL  
    , circulation_count int NOT NULL  
    , circulation_status varchar(50) NOT NULL  
    , highlight_season varchar(50) NOT NULL  
    -- place constraints  
    , CONSTRAINT PK_moments PRIMARY KEY(moment_unique_id)  
)
```

--Creating table with User's moments

```
CREATE TABLE user_moments_collection(  
    --creating cols  
    collection_id int identity  
    , topshot_user_id int NOT NULL  
    , moment_unique_id int NOT NULL  
    , purchase_date datetime NOT NULL  
    --place constraints  
    , CONSTRAINT PK_user_moments_collection PRIMARY KEY(collection_id) ,  
    CONSTRAINT FK1_user_moments_collection FOREIGN KEY(moment_unique_id)  
    REFERENCES moments(moment_unique_id)  
    , CONSTRAINT FK2_user_moments_collection FOREIGN KEY(topshot_user_id)  
    REFERENCES topshot_user(topshot_user_id)
```

```
, CONSTRAINT U1_user_moments_collection UNIQUE(moment_unique_id)
```

--Creating purchase order table for Moments

```
CREATE TABLE moments_purchase_order(  
    moment_po_transaction_id int identity  
    , topshot_user_id int NOT NULL  
    , moment_unique_id int NOT NULL  
    , moment_purchase_price int NOT NULL  
    , payment_type varchar(50) NOT NULL  
    --place constraints  
    , CONSTRAINT PK_moments_purchase_order PRIMARY KEY (moment_po_transaction_id) ,  
    CONSTRAINT FK1_moments_purchase_order FOREIGN KEY(topshot_user_id) REFERENCES  
    topshot_user(topshot_user_id)  
    , CONSTRAINT FK2_moments_purchase_order FOREIGN KEY(moment_unique_id)  
    REFERENCES moments(moment_unique_id)  
)
```

--Creating table for Packs

```
CREATE TABLE packs(  
    pack_id int identity  
    , pack_type varchar(50) NOT NULL  
    , moments_count int NOT NULL  
    , drop_number int NOT NULL  
    , pack_circulation_status varchar(50)  
    , pack_name varchar(50)  
    -- place constraints  
    CONSTRAINT PK_packs PRIMARY KEY(pack_id)  
)
```

-- Creating table for Packs Purchase Order

```
CREATE TABLE pack_purchase_order(  
    pack_po_transaction_id int identity  
    , topshot_user_id int NOT NULL  
    , pack_id int NOT NULL  
    , pack_purchase_price int NOT NULL  
    , payment_type varchar(50) NOT NULL  
    --place constraints  
    , CONSTRAINT PK_pack_purchase_order PRIMARY KEY (pack_po_transaction_id) ,  
    CONSTRAINT FK1_pack_purchase_order FOREIGN KEY(topshot_user_id) REFERENCES  
    topshot_user(topshot_user_id)  
    , CONSTRAINT FK2_pack_purchase_order FOREIGN KEY(pack_id) REFERENCES packs  
    (pack_id)  
)
```

--Creating table for Flow blockchain that validates all transactions CREATE TABLE

```
flow_blockchain(  
    ledger_transaction_id int identity  
    C:\Users\josep\Documents\IST 659_2\Project\SQLQuery1.sql 3 , order_timestamp datetime NOT NULL  
    , pack_id int  
    , pack_po_transaction_id int  
    , moment_po_transaction_id int
```



```

, moment_unique_id int
--place constraints
, CONSTRAINT PK_flow_blockchain PRIMARY KEY(ledger_transaction_id) , CONSTRAINT
FK1_flow_blockchain FOREIGN KEY(pack_id) REFERENCES packs(pack_id)

, CONSTRAINT FK2_flow_blockchain FOREIGN KEY(pack_po_transaction_id) REFERENCES
pack_purchase_order(pack_po_transaction_id)
, CONSTRAINT FK3_flow_blockchain FOREIGN KEY(moment_po_transaction_id)
REFERENCES moments_purchase_order(moment_po_transaction_id)
, CONSTRAINT FK4_flow_blockchain FOREIGN KEY(moment_unique_id) REFERENCES
moments(moment_unique_id)
)

```

-- There is a bug in our payment system that need to be resolved, -- it's only affecting the base set packs so we have to change these from available to unavailable.

```
SELECT * FROM packs
```

	pack_id	pack_type	pack_purchase_price	moments_count	drop_number	pack_circulation_status	pack_name
1	1	common	20	8	3	available	base set
2	2	rare	99	10	1	sold out	lace em up
3	3	common	20	8	1	available	base set
4	4	rare	99	10	3	sold out	lace em up
5	5	common	20	8	2	available	base set
6	6	rare	99	10	3	sold out	lace em up
7	7	common	20	8	1	available	base set
8	8	common	20	8	1	available	base set
9	9	common	20	8	1	available	base set
10	10	rare	99	10	1	sold out	lace em up
11	11	common	20	8	2	available	base set
12	12	common	20	8	1	available	base set
13	13	common	20	8	3	available	base set
14	14	common	20	8	1	available	base set
15	15	common	20	8	3	available	base set

-- We do not have the unavailable pack circulation status so we have to insert that into our table first

--adding unavailable status, so we know which packs are not sold out, and available for purchase once we fix the bug

```
UPDATE packs SET pack_circulation_status = 'unavailable' WHERE
pack_circulation_status = 'available'
```

```
SELECT * FROM packs
```

	pack_id	pack_type	pack_purchase_price	moments_count	drop_number	pack_circulation_status	pack_name
1	1	common	20	8	3	unavailable	base set
2	2	rare	99	10	1	sold out	lace em up
3	3	common	20	8	1	unavailable	base set
4	4	rare	99	10	3	sold out	lace em up
5	5	common	20	8	2	unavailable	base set
6	6	rare	99	10	3	sold out	lace em up
7	7	common	20	8	1	unavailable	base set
8	8	common	20	8	1	unavailable	base set
9	9	common	20	8	1	unavailable	base set
10	10	rare	99	10	1	sold out	lace em up
11	11	common	20	8	2	unavailable	base set
12	12	common	20	8	1	unavailable	base set
13	13	common	20	8	3	unavailable	base set
14	14	common	20	8	1	unavailable	base set
15	15	common	20	8	3	unavailable	base set

--cool, now our ecommerce platform has marked our available base set cards to unavailable,  
--that way once the bug is fixed we can switch the unavails back to avail

-- insert our users into the topshot\_user table

```
insert into topshot_user (user_join_date, topshot_username, showcases_count,
moments_count, user_team)
```

values

```
('2020-06-15 02:06:31', 'rbrownsmith0', 6, 1184, null)
,('2020-02-06 02:32:01', 'anesbeth1', 6, 54, 'Phoenix Suns')
,('2019-08-26 20:40:08', 'tcustance2', null, 1261, 'Milwaukee Bucks') , ('2020-11-17
20:10:35', 'glamey3', 10, 903, 'San Antonio Spurs') , ('2020-04-04 16:43:18', 'braffels4',
null, 293, 'Indiana Pacers') , ('2020-08-26 07:04:01', 'lwessing5', 9, 1030, 'Washington
Wizards')
, ('2019-09-05 14:18:15', 'anazer6', 2, 974, null)
, ('2019-08-03 20:25:05', 'llawey7', 4, 552, 'Golden State Warriors') , ('2019-08-26
02:46:36', 'mbosward8', 6, 1234, null)
, ('2019-08-27 09:19:55', 'hhasted9', null, 354, 'Phoenix Suns')
, ('2020-01-27 01:50:29', 'gaugustea', null, 678, 'Oklahoma City Thunder') , ('2020-10-03
07:46:36', 'cponcefordb', null, 605, 'Portland Trail Blazers') , ('2020-01-15 14:50:08', 'tsperac',
null, 635, 'San Antonio Spurs') , ('2020-07-16 21:52:48', 'hnandd', 10, 460, 'Phoenix Suns')
, ('2019-07-15 17:54:12', 'tmullingere', 10, 893, 'Los Angeles Lakers') , ('2020-10-21
04:18:11', 'dhearnef', null, 1093, 'New York Knicks') , ('2019-10-21 00:41:34', 'murlingg',
null, 1006, null)
, ('2020-09-08 10:57:29', 'tskinh', 1, 212, 'Utah Jazz')
, ('2020-08-22 06:19:17', 'ldoughtyi', 3, 789, 'Atlanta Hawks')
, ('2020-09-03 16:17:18', 'cberthomierj', null, 893, 'Utah Jazz') , ('2020-03-19 12:46:33',
'zvelak', 4, 866, 'Cleveland Cavaliers') , ('2020-10-15 20:29:09', 'leynaldi', null, 216, 'Los
Angeles Clippers') , ('2019-10-12 19:57:04', 'pbarnwallm', null, 240, 'Dallas Mavericks')
```

--Let's check our data!

```
SELECT * FROM topshot_user
```

Results Messages

	topshot_user_id	topshot_username	user_join_date	showcases_count	moments_count	user_team
1	1	agilburt0	2019-11-16 00:00:00.000	2	NULL	NULL
2	2	rpickett0	2020-11-30 21:33:12.000	NULL	1128	Orlando Magic
3	3	rbrownsmith0	2020-06-15 02:06:31.000	6	1184	NULL
4	4	anesbeth1	2020-02-06 02:32:01.000	6	54	Phoenix Suns
5	5	tcustance2	2019-08-26 20:40:08.000	NULL	1261	Milwaukee Bucks
6	6	glamey3	2020-11-17 20:10:35.000	10	903	San Antonio Spurs
7	7	braffels4	2020-04-04 16:43:18.000	NULL	293	Indiana Pacers
8	8	lwessing5	2020-08-26 07:04:01.000	9	1030	Washington Wizards
9	9	anazer6	2019-09-05 14:18:15.000	2	974	NULL
10	10	llawey7	2019-08-03 20:25:05.000	4	552	Golden State Warriors
11	11	mbosward8	2019-08-26 02:46:36.000	6	1234	NULL
12	12	hhasted9	2019-08-27 09:19:55.000	NULL	354	Phoenix Suns
13	13	gaugustea	2020-01-27 01:50:29.000	NULL	678	Oklahoma City Thunder
14	14	cponcefordb	2020-10-03 07:46:36.000	NULL	605	Portland Trail Blazers
15	15	tsperac	2020-01-15 14:50:08.000	NULL	635	San Antonio Spurs

--We have users now! Lot's of them have not created showcases, some have not selected their favorite team, and one has not purchases any moments!

-- Insert data officially licensed nba highlights into the moments table

```
insert into moments (serial_number, player_name , game_date , pack_name , highlight_type
, moment_type , circulation_count, circulation_status , highlight_season)
values (39, 'Steven Adams', '07/29/2020', 'base set', 'layup', 'rare', 3326, 'cc', '2019-2020')
,(94, 'Paul Millsap', '08/20/2020', 'metallic hold le', 'block', 'common', 3326, 'cc', '2018-2019')
,(171, 'OG Anunoby', '10/02/2020', 'metallic hold le', 'steal', 'common', 299, 'le', '2019-2020')
,(8, 'Royce O'Neale', '08/31/2020', 'so fresh', 'steal', 'common', 299, 'cc', '2019-2020')
,(90, 'Joe Harris', '10/07/2020', 'so fresh', 'handles', 'rare', 299, 'cc', '2019-2020')
,(180, 'Nemanja Bjelica', '10/16/2020', 'metallic hold le', 'handles', 'common', 275, 'le', '2019-2020')
,(74, 'Miles Bridges', '08/08/2020', 'premium pack', 'handles', 'common', 2343, 'le', '2019-2020')
,(55, 'Caris LeVert', '07/28/2020', 'metallic hold le', 'handles', 'common', 3326, 'cc', '2019-2020')
,(242, 'Jonathan Isaac', '08/09/2020', 'base set', 'dunk', 'common', 345, 'cc', '2019-2020')
,(6, 'Tyler Herro', '10/16/2020', 'metallic hold le', 'steal', 'common', 3134, 'le', '2019-2020')
,(138, 'Patty Mills', '07/27/2020', 'premium pack', 'layup', 'common', 3134, 'cc', '2019-2020')
,(123, 'OG Anunoby', '08/08/2020', 'lace em" up', 'handles', 'common', 1232, 'cc', '2019-2020')
,(79, 'Derrick White', '08/07/2020', 'so fresh', 'steal', 'common', 150, 'cc', '2018-2019')
,(12, 'Willie Cauley-Stein', '09/28/2020', 'premium pack', 'assist', 'common', 3134, 'le', '2019-2020')
,(20, 'Seth Curry', '07/30/2020', 'so fresh', 'dunk', 'common', 3134, 'cc', '2019-2020')
,(173, 'Doug McDermott', '10/10/2020', 'lace em" up', 'block', 'common', 3326, 'cc', '2018-2019')
,(30, 'Brandon Clarke', '10/02/2020', 'premium pack', 'dunk', 'common', 299, 'le', '2019-2020')
,(240, 'John Henson', '09/20/2020', 'base set', 'steal', 'common', 3134, 'le', '2018-2019')
,(295, 'Bogdan Bogdanovic', '08/11/2020', 'premium pack', 'dunk', 'common', 3134, 'cc', '2019-2020')
,(255, 'Patty Mills', '08/21/2020', 'base set', 'steal', 'common', 2343, 'le', '2019-2020')
,(238, 'Bojan Bogdanovic', '07/23/2020', 'base set', 'handles', 'rare', 150, 'cc', '2019-2020')
,(114, 'Donovan Mitchell', '07/22/2020', 'lace em" up', 'assist', 'rare', 299, 'cc', '2019-2020')
,(137, 'Pascal Siakam', '10/09/2020', 'metallic hold le', 'jump shot', 'common', 3134, 'cc', '2019-2020')
,(46, 'Jae Crowder', '08/07/2020', 'metallic hold le', 'block', 'common', 150, 'cc', '2019-2020')
```

, (36, 'Ish Smith', '07/28/2020', 'so fresh', 'dunk', 'common', 1232, 'cc', '2018-2019')  
 ,(280, 'P.J. Tucker', '10/12/2020', 'lace em" up', 'dunk', 'rare', 345, 'le', '2019-2020')  
 ,(138, 'RJ Barrett', '10/12/2020', 'metallic hold le', 'layup', 'common', 2343, 'le', '2019-2020')  
 ,(281, 'Pascal Siakam', '09/15/2020', 'metallic hold le', 'block', 'common', 3134, 'cc', '2019-2020')  
 ,(249, 'Doug McDermott', '09/24/2020', 'metallic hold le', 'block', 'common', 2432, 'cc', '2019-2020')  
 ,(121, 'Aron Baynes', '09/03/2020', 'so fresh', 'handles', 'common', 2343, 'cc', '2019-2020')  
 ,(79, 'Kenneth Faried', '07/29/2020', 'so fresh', 'jump shot', 'common', 1232, 'cc', '2019-2020')  
 ,(138, 'Kosta Koufos', '09/27/2020', 'so fresh', 'layup', 'common', 345, 'cc', '2019-2020')  
 ,(275, 'Pascal Siakam', '09/09/2020', 'lace em" up', 'steal', 'rare', 275, 'cc', '2019-2020')  
 ,(223, 'Dejounte Murray', '09/11/2020', 'premium pack', 'dunk', 'common', 2432, 'le', '2019-2020')  
 ,(292, 'Tyler Zeller', '08/26/2020', 'base set', 'assist', 'rare', 2432, 'cc', '2019-2020')  
 ,(65, 'Denzel Valentine', '10/08/2020', 'base set', 'assist', 'common', 345, 'cc', '2018-2019')

--Lots of rows, but that's bc we want a large inventory of highlights for users to purchase!

	moment_unique_id	serial_number	player_name	game_date	pack_name	highlight_type	moment_type	circulation_count	circulation_status	highlight_season
1	2001	39	Steven Adams	2020-07-29 00:00:00.000	base set	layup	rare	3326	cc	2019-2020
2	2002	94	Paul Millsap	2020-08-20 00:00:00.000	metallic hold le	block	common	3326	cc	2018-2019
3	2003	171	OG Anunoby	2020-10-02 00:00:00.000	metallic hold le	steal	common	299	le	2019-2020
4	2004	8	Royce O'Neale	2020-08-31 00:00:00.000	so fresh	steal	common	299	cc	2019-2020
5	2005	90	Joe Harris	2020-10-07 00:00:00.000	so fresh	handles	rare	299	cc	2019-2020
6	2006	180	Nemanja Bjelica	2020-10-16 00:00:00.000	metallic hold le	handles	common	275	le	2019-2020
7	2007	74	Miles Bridges	2020-08-08 00:00:00.000	premium pack	handles	common	2343	le	2019-2020
8	2008	55	Caris LeVert	2020-07-28 00:00:00.000	metallic hold le	handles	common	3326	cc	2019-2020
9	2009	242	Jonathan Isaac	2020-08-09 00:00:00.000	base set	dunk	common	345	cc	2019-2020
10	2010	6	Tyler Herro	2020-10-16 00:00:00.000	metallic hold le	steal	common	3134	le	2019-2020
11	2011	138	Patty Mills	2020-07-27 00:00:00.000	premium pack	layup	common	3134	cc	2019-2020
12	2012	123	OG Anunoby	2020-08-08 00:00:00.000	lace em" up	handles	common	1232	cc	2019-2020
13	2013	79	Derrick White	2020-08-07 00:00:00.000	so fresh	steal	common	150	cc	2018-2019
14	2014	12	Willie Cauley-Stein	2020-09-28 00:00:00.000	premium pack	assist	common	3134	le	2019-2020
15	2015	20	Seth Curry	2020-07-30 00:00:00.000	so fresh	dunk	common	3134	cc	2019-2020

--Now let's insert moments to user's collections that were already purchased from July - November 2020

```
insert into user_moments_collection (topshot_user_id, moment_unique_id,
  purchase_date)
values (25, 2953, '8/8/2020')
,(18, 2007, '11/19/2020')
,(4, 2534, '10/30/2020')
,(10, 2505, '7/21/2020')
,(1, 2216, '7/13/2020')
,(1, 2783, '11/24/2020')
,(3, 2385, '11/18/2020')
,(14, 2524, '8/7/2020')
,(6, 2373, '11/29/2020')
,(8, 2155, '11/1/2020')
,(1, 2744, '8/20/2020')
,(6, 2168, '11/5/2020')
,(12, 2204, '7/25/2020')
,(10, 2419, '8/27/2020')
,(12, 2876, '7/18/2020')
,(12, 2737, '8/15/2020')
,(4, 2082, '8/8/2020')
,(3, 2332, '10/3/2020')
```

,(7, 2063, '8/15/2020')  
,(18, 2925, '9/5/2020')  
,(18, 2962, '9/14/2020')  
,(5, 2681, '7/24/2020')  
,(16, 2420, '7/15/2020')  
,(1, 2916, '8/5/2020')  
,(25, 2150, '7/23/2020')  
,(18, 2794, '11/19/2020')  
,(18, 2578, '7/20/2020')  
,(4, 2675, '8/5/2020')  
,(8, 2046, '9/28/2020')  
,(14, 2278, '10/9/2020')  
,(6, 2686, '10/2/2020')  
,(14, 2712, '7/13/2020')  
,(12, 2410, '9/29/2020')  
,(17, 2395, '7/4/2020')  
,(10, 2615, '11/23/2020')  
,(15, 2110, '11/13/2020')  
,(19, 2283, '11/14/2020')  
,(3, 2209, '7/6/2020')  
,(17, 2493, '10/27/2020')  
,(11, 2132, '10/15/2020')  
,(21, 2343, '8/6/2020')  
,(12, 2428, '11/8/2020')  
,(4, 2279, '8/25/2020')  
,(23, 2223, '11/26/2020')  
,(3, 2695, '11/24/2020')  
,(7, 2259, '9/15/2020')  
,(9, 2598, '9/25/2020')  
,(6, 2701, '10/22/2020')  
,(18, 2420, '11/11/2020')  
,(12, 2681, '11/26/2020')  
,(6, 2449, '7/12/2020')  
,(10, 2885, '9/30/2020')  
,(23, 2299, '11/11/2020')  
,(7, 2277, '8/1/2020')  
,(24, 2942, '9/30/2020')  
,(19, 2353, '8/10/2020')  
,(3, 2395, '9/21/2020')  
,(12, 2187, '11/28/2020')  
,(25, 2383, '8/31/2020')  
,(2, 2064, '9/27/2020')  
,(11, 2278, '10/31/2020')  
,(5, 2130, '9/23/2020')  
,(20, 2395, '9/2/2020')  
,(23, 2980, '9/4/2020')  
,(12, 2207, '8/14/2020')  
,(15, 2065, '9/16/2020')  
,(5, 2763, '11/2/2020')  
,(21, 2085, '11/7/2020')  
,(12, 2058, '9/15/2020')  
,(23, 2459, '10/25/2020')

```
, (12, 2360, '11/24/2020')
, (3, 2519, '8/25/2020')
, (6, 2297, '7/18/2020')
, (1, 2269, '10/4/2020')
, (14, 2467, '9/10/2020')
, (13, 2274, '11/27/2020')
, (8, 2211, '10/28/2020')
, (15, 2346, '8/23/2020')
, (9, 2661, '10/2/2020')
, (25, 2846, '9/8/2020')
, (10, 2257, '10/19/2020')
, (14, 2359, '7/6/2020')
, (17, 2568, '9/18/2020')
, (11, 2667, '11/22/2020')
, (2, 2164, '7/18/2020')
, (8, 2298, '10/21/2020')
, (1, 2798, '9/6/2020')
, (13, 2688, '7/30/2020')
, (20, 2537, '9/8/2020')
, (20, 2779, '9/7/2020')
, (19, 2010, '9/23/2020')
, (5, 2707, '10/3/2020')
, (11, 2382, '10/23/2020')
, (10, 2021, '8/1/2020')
, (5, 2690, '10/14/2020')
, (17, 2984, '8/20/2020')
, (8, 2054, '8/3/2020')
, (15, 2314, '10/3/2020')
, (7, 2372, '7/3/2020')
, (21, 2254, '9/24/2020')
```

```
SELECT * FROM user_moments_collection
```

	collection_id	topshot_user_id	moment_unique_id	purchase_date
1	1	25	2953	2020-08-08 00:00:00.000
2	2	18	2007	2020-11-19 00:00:00.000
3	3	4	2534	2020-10-30 00:00:00.000
4	4	10	2505	2020-07-21 00:00:00.000
5	5	1	2216	2020-07-13 00:00:00.000
6	6	1	2783	2020-11-24 00:00:00.000
7	7	3	2385	2020-11-18 00:00:00.000
8	8	14	2524	2020-08-07 00:00:00.000
9	9	6	2373	2020-11-29 00:00:00.000
10	10	8	2155	2020-11-01 00:00:00.000
11	11	1	2744	2020-08-20 00:00:00.000
12	12	6	2168	2020-11-05 00:00:00.000
13	13	12	2204	2020-07-25 00:00:00.000
14	14	10	2419	2020-08-27 00:00:00.000
15	15	12	2876	2020-07-18 00:00:00.000

--Now let's insert information about packs available for purchase where users can buy their moments  
insert into packs (pack\_type, pack\_purchase\_price , moments\_count , drop\_number ,



```

    pack_circulation_status , pack_name)
values ('common', '20', '8', 3, 'available', 'base set')
,('rare', '99', '10', 1, 'sold out', 'lace em up')
,('common', '20', '8', 1, 'available', 'base set')
,('rare', '99', '10', 3, 'sold out', 'lace em up')
,('common', '20', '8', 2, 'available', 'base set')
,('rare', '99', '10', 3, 'sold out', 'lace em up')
,('common', '20', '8', 1, 'available', 'base set')
,('common', '20', '8', 1, 'available', 'base set')
,('common', '20', '8', 1, 'available', 'base set')
,('rare', '99', '10', 1, 'sold out', 'lace em up')
,('common', '20', '8', 2, 'available', 'base set')
,('common', '20', '8', 1, 'available', 'base set')
,('common', '20', '8', 3, 'available', 'base set')
,('common', '20', '8', 1, 'available', 'base set')
,('common', '20', '8', 3, 'available', 'base set')
,('common', '20', '8', 2, 'available', 'base set')
,('common', '20', '8', 3, 'available', 'base set')
,('common', '20', '8', 3, 'available', 'base set')
,('common', '20', '8', 3, 'available', 'base set')
,('common', '20', '8', 2, 'available', 'base set')

```

--Now that we have our packs for sale, let's add most recent Pack transactions

```

insert into pack_purchase_order (topshot_user_id, pack_id, payment_type)

```

```

values (13, 16, 'debit card')
, (1, 16, 'paypal')
, (17, 15, 'ethereum')
, (4, 10, 'ethereum')
, (5, 9, 'paypal')
, (13, 16, 'credit card')
, (17, 14, 'paypal')
, (1, 7, 'ethereum')

```

--Now let's add moments that were most recently purchased

```

insert into moments_purchase_order (topshot_user_id, moment_unique_id,
    moment_purchase_price , payment_type)

```

```

values (14, 2591, 1457, 'ethereum')
, (10, 2694, 943, 'debit card')
, (23, 2277, 1987, 'paypal')
, (23, 2865, 2145, 'debit card')
, (23, 2660, 1488, 'ethereum')
, (15, 2899, 2166, 'paypal')
, (11, 2684, 1943, 'credit card')
, (19, 2436, 1972, 'credit card')

```

-- finally, let's add data to the flow blockchain which validates all our transactions

```

insert into flow_blockchain (order_timestamp , pack_id, pack_po_transaction_id,
    moment_po_transaction_id, moment_unique_id)

```

```

values ('2020-06-09 08:04:02', 9, 7, null, null)

```

```
, ('2020-03-12 07:15:13', 18, 4, 101, 2079)
, ('2020-06-26 11:01:18', 20, 2, 102, 2748)
, ('2020-07-24 01:03:28', 4, 3, 105, 2179)
, ('2019-12-05 20:20:28', 15, 1, null, null)
, ('2020-01-22 08:41:14', 2, 6, 107, 2160)
, ('2020-06-05 15:30:05', 19, 3, 104, 2497)
, ('2020-07-18 02:33:49', 2, 1, 107, 2576)
, ('2020-07-14 11:47:55', 16, 8, 104, 2149)
, ('2019-12-15 22:47:53', 6, 4, 104, 2764)
, ('2020-07-09 22:57:31', 10, 2, 107, 2554)
, ('2020-07-29 11:35:46', 18, 6, 102, 2581)
, ('2020-11-21 15:19:31', 13, 8, 103, 2202)
, ('2020-08-31 04:04:07', 4, 7, 104, 2236)
, ('2020-06-12 06:11:02', 3, 7, 102, 2430)
, ('2019-12-18 16:00:18', 6, 4, 101, 2133)
, ('2020-01-23 09:10:47', 17, 7, 105, 2825)
, ('2020-08-16 14:53:31', 6, 4, 108, 2092)
```

--Create view of User and their moments

CREATE VIEW TopShotUserMomentsLibrary

AS

SELECT

topshot\_user.topshot\_username AS UserName

, moments.moment\_unique\_id as MOMENT

FROM user\_moments\_collection

INNER JOIN user\_moments\_collection ON user\_moments\_collection.topshot\_user\_id =

topshot\_user.topshot\_user\_id

GO

## Data Question #1: From our early adopter cohort, who owns the highest amount of Moments?

-- Data Question #1: From our early adopters cohort, who owns the most moments and how many?

SELECT topshot\_user.user\_join\_date, topshot\_user.topshot\_username,

topshot\_user.user\_team, topshot\_user.moments\_count

FROM topshot\_user

WHERE moments\_count > 1000

ORDER BY topshot\_user.moments\_count DESC;

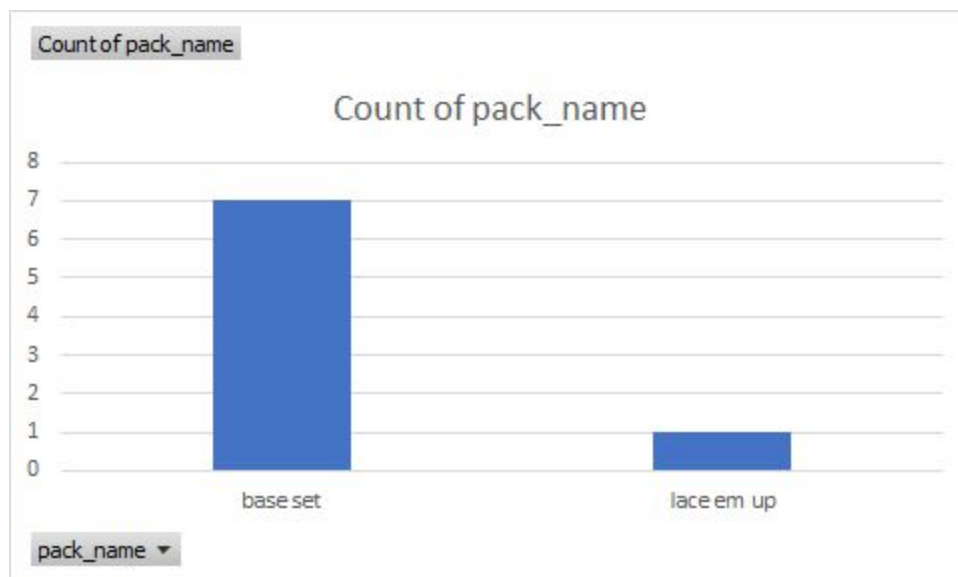


user_join_date	topshot_user	user_team	moments_count
8/26/2019 8:40:08 PM	tcustance2	Milwaukee Bucks	1261
8/26/2019 2:46:36 AM	mbosward8		1234
6/15/2020 2:06:31 AM	rbrownsmith0		1184
11/30/2020 9:33:12 PM	rpickett0	Orlando Magic	1128
10/21/2020 4:18:11 AM	dhearnef	New York Knicks	1093
8/26/2020 7:04:01 AM	lwessing5	Washington Wizards	1030
10/21/2019 12:41:34 AM	murlingg		1006

Data Question #2: From the most recent transactions added, what pack was the best selling?

-- Data Question #2: From the most recent pack purchase order transactions, what pack was the best selling?

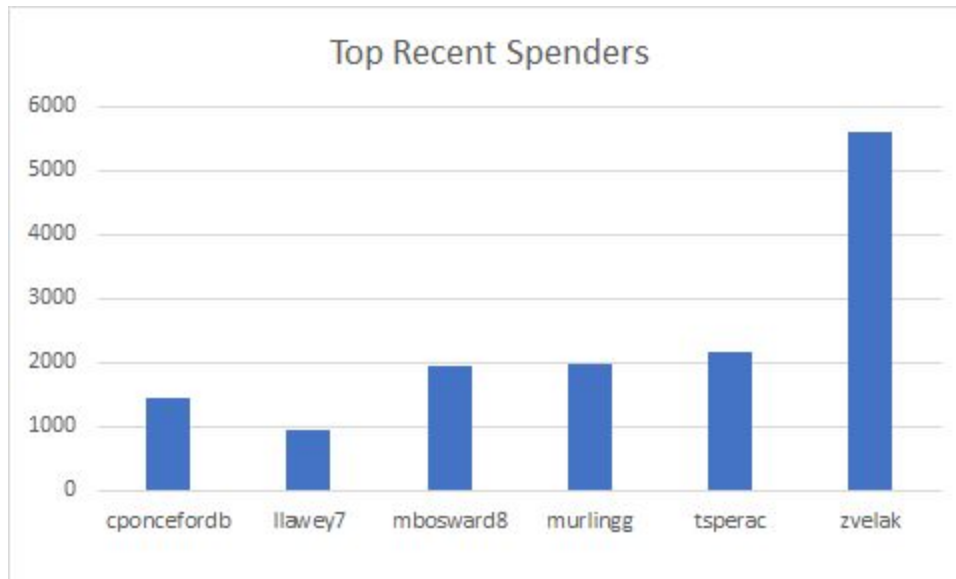
```
SELECT packs.pack_name, packs.pack_purchase_price, topshot_user.topshot_username FROM
topshot_user
INNER JOIN (packs INNER JOIN pack_purchase_order
ON packs.pack_id = pack_purchase_order.pack_id)
ON topshot_user.topshot_user_id = pack_purchase_order.topshot_user_id;
```



Data Question #3: From the most recent moment order transactions, who spend the most money and how much?

-- Data Question #3: From most recent moment order transactions, who spent the most money and how much?

```
SELECT topshot_user.topshot_username, Count(moments_purchase_order.payment_type) AS
CountOfpayment_type
,Sum(moments_purchase_order.moment_purchase_price) AS SumOfmoment_purchase_price
FROM topshot_user INNER JOIN moments_purchase_order
ON topshot_user.topshot_user_id = moments_purchase_order.topshot_user_id GROUP
BY topshot_user.topshot_username
ORDER BY Count(moments_purchase_order.payment_type);
```



Data question #4: From our most recent moment purchases, what was the average transaction per moment type by each user?

-- Data Question #4: From our most recent moment purchases, what was the average transaction per moment type by each user?

```
SELECT topshot_user.topshot_username,
Avg(moments_purchase_order.moment_purchase_price) AS AvgOfmoment_purchase_price,
moments.moment_type
FROM moments INNER JOIN (topshot_user INNER JOIN moments_purchase_order ON
topshot_user.topshot_user_id = moments_purchase_order.topshot_user_id) ON
moments.moment_unique_id = moments_purchase_order.moment_unique_id GROUP BY
topshot_user.topshot_username, moments.moment_type
ORDER BY topshot_user.topshot_username;
```



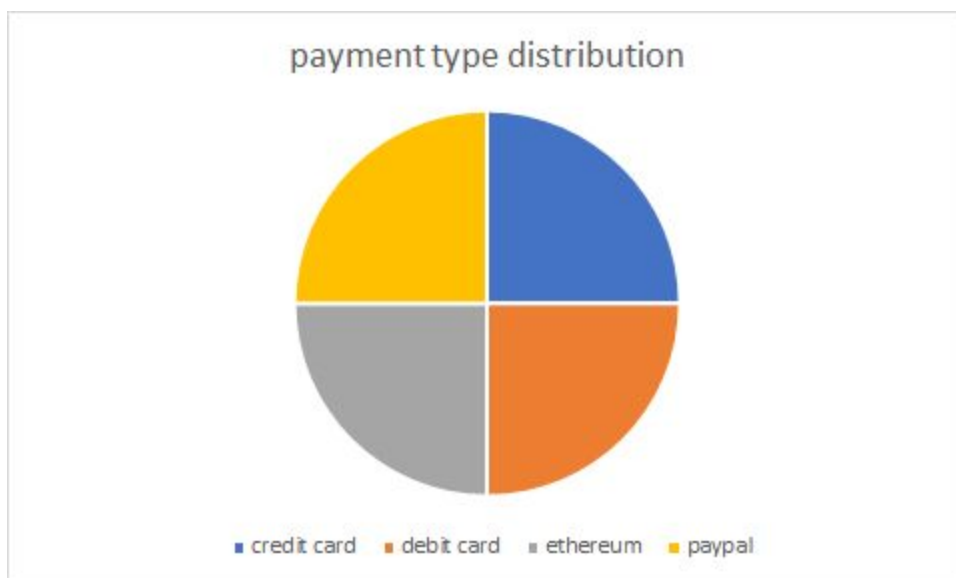
Data Question #5: What was the most popular payment type from the most recent transactions?

--Data Question #5: What was the most popular payment type from the most recent transactions?

SELECT Count(moments\_purchase\_order.moment\_po\_transaction\_id)

AS CountOfmoment\_po\_transaction\_id, moments\_purchase\_order.payment\_type FROM  
moments\_purchase\_order

GROUP BY moments\_purchase\_order.payment\_type;



## Reflection

My biggest assumption in this class was that, given the fact that I had never coded a single line of SQL, that it would be impossible for me to plan, design, and code an entire database.

My honest assumption was that I would drop the class and have to start over again next terms because it would be too difficult; however, the class format was very helpful as we started from the very beginning of DBMS. Understanding how tables, data formats, and relationships through foreign keys really helped me understand what was going on in relation to actually coding the database.

Understanding the concept of foreign keys and relational databases has helped me in my professional work so much. I no longer think of datasets as two separate entities, but rather one full set of data that can be combined through a common identifier. This has saved me so much time and plenty of mistakes when it comes to reporting and analysis of my work.

Understanding the concept of primary keys has also helped me understand why so many SAAS and even HR softwares use, what I use to think were random numbers, but are actually primary and foreign keys that help the software end-users identify and combine certain pieces of information.

Next time, if I do end up going through these steps again, one thing that I would do differently is really dig into the business to understand what are the most important data questions, and then build a schema and database that will help me answer or explore these questions. Given that my project was based on a business that's still in beta, it was kind of hard to understand what is most important to them in terms of the data questions they would possibly ask a Database Manager.

## Summary

The two interface tools I decided to use for this project worked well hand in hand with each other given that they are both Microsoft products. One of the advantages to using the Access tool was that the interactive relationships tool where you have to map out your table relationships, was really helpful to visualize how these tables would join or how the group by features worked. The Access tool provided a great front-end type UX where you can visualize more clearly the relationships that are happening between tables and columns in the tables.

Most of the data questions were fairly straightforward, one thing I realized once I started creating the tables in SQL was that a lot of the NBA player information was very hard to find and I was not able to match specific players to their highlight dates because I would have to look through hundreds of moments to match the date, player, moment type, highlight type, etc. Given this project, I mostly used generic info and quickly went through the TopShot website, looked at the moment and highlight types and then randomly assigned them to players. Also the highlight information was hard to get, because certain highlights happened on certain days, and I would not be able to find all of that information without going through a lot of highlights.

Overall I feel like Topshot's partnership with the NBA was immensely useful because the NBA most likely carries all that information in their databases and TopShot most likely is able to more easily match and cross reference data and information that has already been collected. I had to start from scratch so much of the data in my database is randomized.