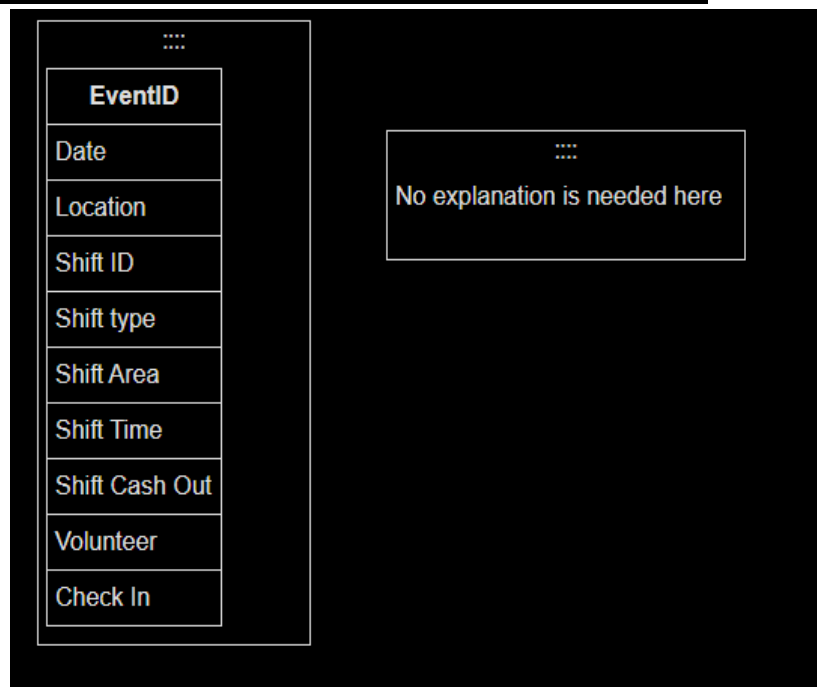


## Ezekiel Enns DATABASE normalization

ONF									
Raw data TBL									
Event ID	Date	Location	Shift ID	Shift Type	Shift Area	Shift Time	Shift Cash Out	Volunteer	Check In
2017-12	20Apr2020	Century Casino Edmonton	M01	SFA01	Slot Floor A	800+4	11000	A20:Jim Kirk:555 - 2344	No
2017-12	20Apr2020	Century Casino Edmonton	M01	SFA01	Slot Floor A	800+4	11000	A21:Red Shirt:555-2345	No
2017-12	20Apr2020	Century Casino Edmonton	M02	CRA05	Cash Room A	1600+4	22000	A55:John Picard:555-1701	Yes
2017-12	20Apr2020	Century Casino Edmonton	M02	CRA05	Cash Room A	1600+4	22000	C32:Bill Riker:555-0009	No
2017-12	20Apr2020	Century Casino Edmonton	M03	PRE11	Poker Room E	1200+4	33000	B88:Harry Mudd:555-3525	No

this is a example of the data in 0 normal form the schema for it

as you can see its pretty nasty so lets fix that with first normal form

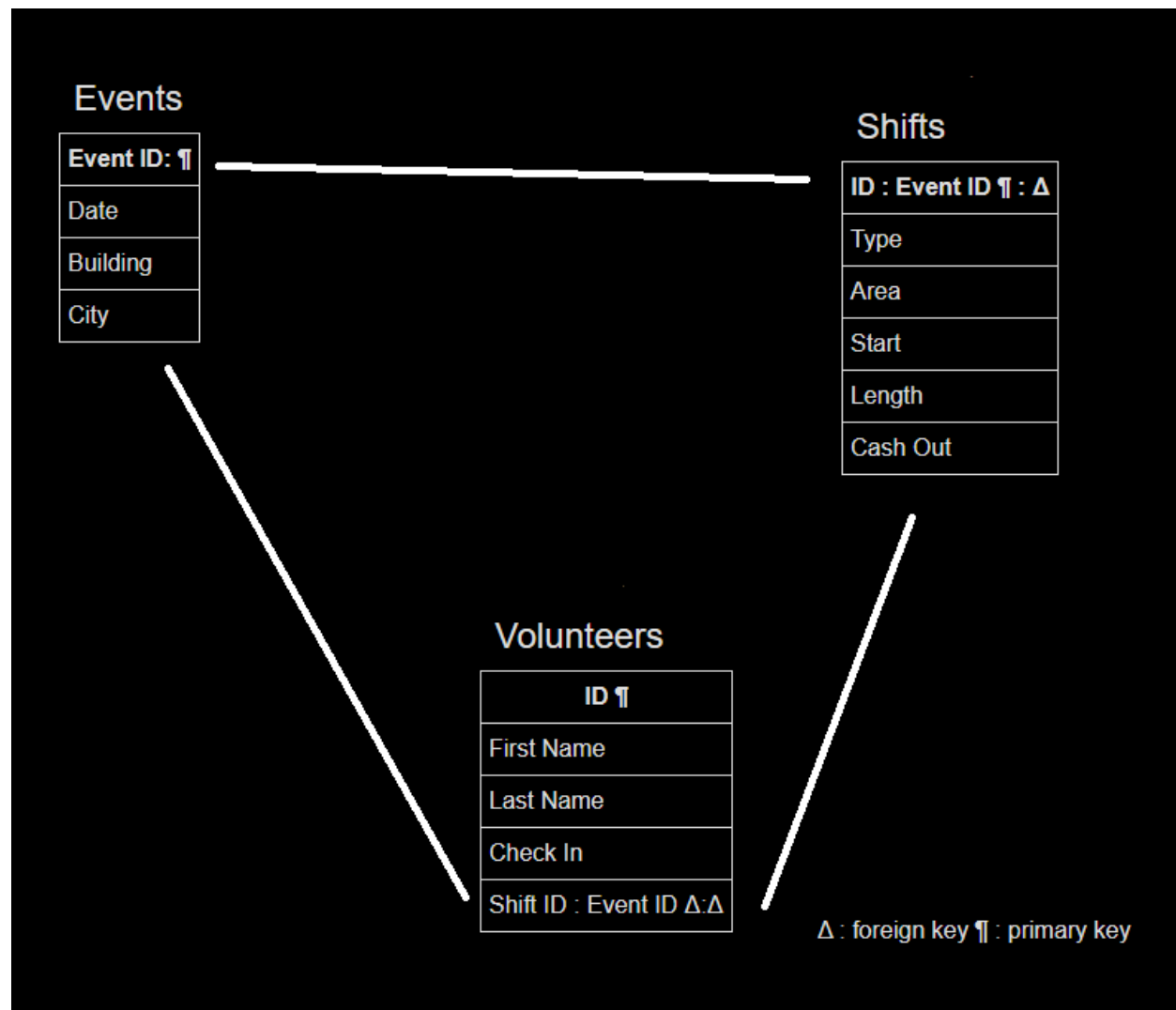


## First Normal Form

1NF violations found in ONF Include:

- Composite data found in location and volunteer
- Repeating data found in event, shift and volunteer columns

After breaking down the composite data to atomic values, I created 3 tables to represent that event data, the shift data and volunteer data, using a compound key as the primary key to link both shift to events and volunteers to events and shifts, bellow is the schema representing my changes



And in practice here is a example of using the data you gave us

Events			
Event ID	Date	Building	City
2017-12	20-Apr-2020	Century Casino	Edmonton

Shifts per Event					
Shift ID: Event ID	Type	Area	Start	Length	Cash Out
M01:2017-12	SFA01	Slot Floor A	08:00	4	11000
M02:2017-12	CRA05	Cash Room A	16:00	4	22000
M03:2017-12	PRE11	Poker Room E	12:00	4	33000

Volunteers					
ID	First name	Last Name	Phone	Check in	Shift ID: Event ID
A20	Jim	Kirk	555-2344	No	M01:2017-12
A21	Red	Shirt	555-2345	No	M01:2017-12
A55	John	Picard	555-1701	Yes	M02:2017-12
C32	Bill	Riker	555-0009	No	M02:2017-12
B88	Harry	Mudd	555-3525	No	M03:2017-12

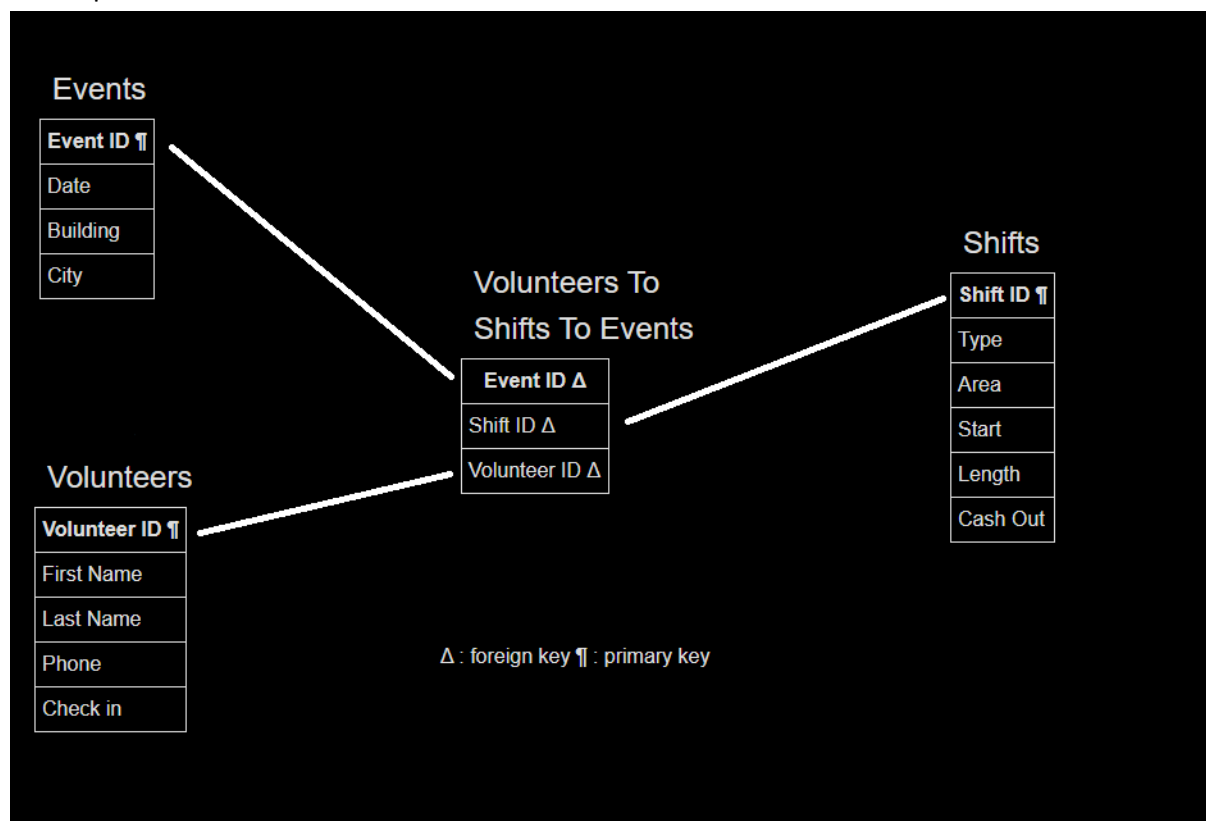
As you can see its better then 0NF but the composite key makes me feel queasy so lets fix it in 2NF, but it is nice to have keys..

## Second Normal Form

2NF violations found in 1NF Include:

- Composite keys!!!! Found in in shifts primary key

So in order to fix the awful composite key I made a 4<sup>th</sup> table that pairs the Volunteer ID with the Shift ID and the Event ID creating a nice way to query what event a shift a volunteer has since shift ID's are not unique for events



And an example of its inaction with your raw data is below

Events

Event ID	Date	Building	City
2017-12	20-Apr-2020	Century Casino	Edmonton

## 2NF

Volunteer To Shift and Event

Volunteer ID	Shift ID	Event ID
A20	M01	2017-12
A21	M01	2017-12
A55	M02	2017-12
C32	M02	2017-12
B88	M03	2017-12

Volunteers

ID	First name	Last Name	Phone	Check in
A20	Jim	Kirk	555-2344	No
A21	Red	Shirt	555-2345	No
A55	John	Picard	555-1701	Yes
C32	Bill	Riker	555-0009	No
B88	Harry	Mudd	555-3525	No

Shifts

Shift ID	Type	Area	Start	Length	Cash Out
M01	SFA01	Slot Floor A	08:00	4	11000
M02	CRA05	Cash Room A	16:00	4	22000
M03	PRE11	Poker Room E	12:00	4	33000

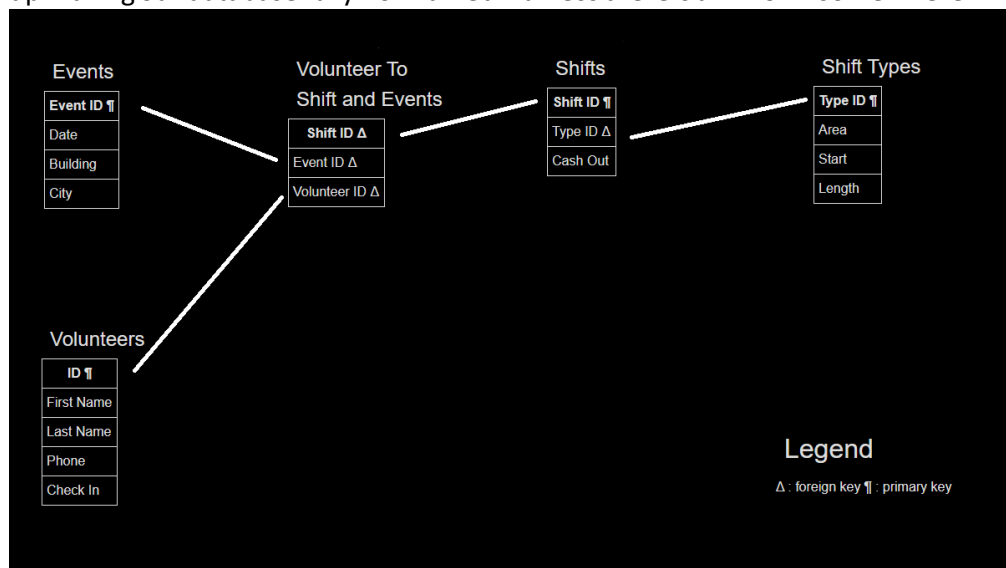
Oooh aaah, its still not perfect yet so we need to make it better

## Third Normal Form

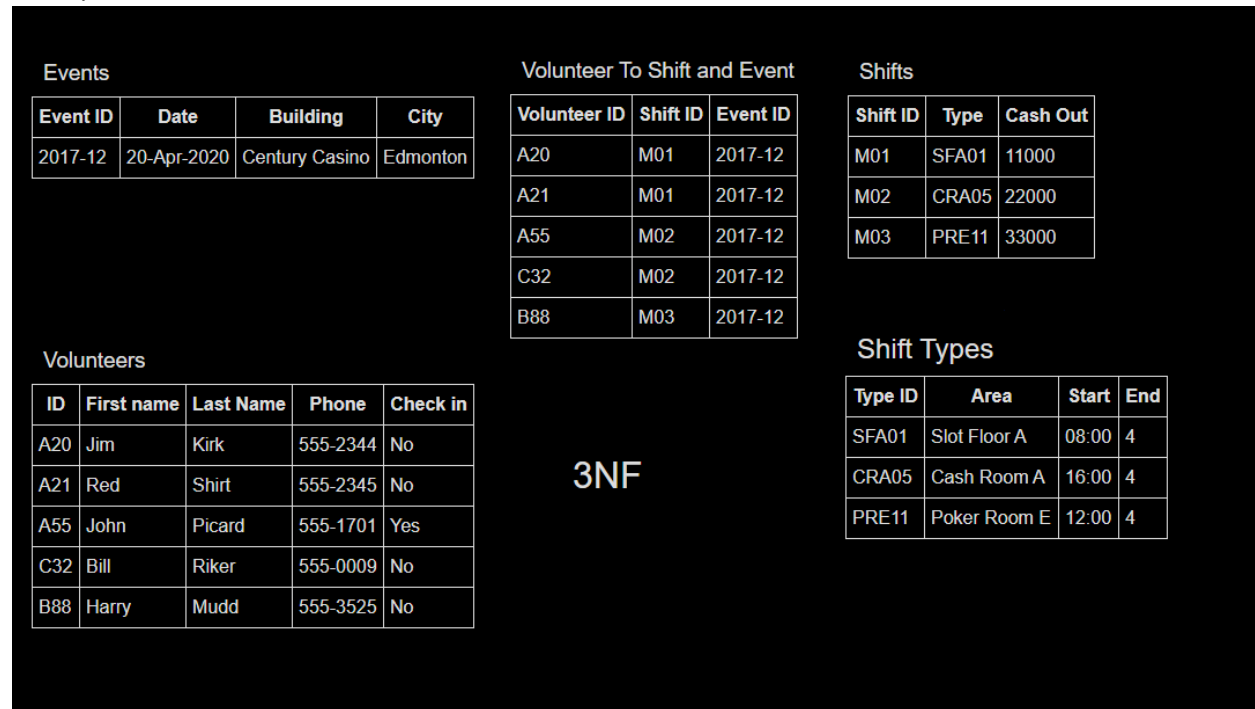
3NF violations found in 2NF Include:

- None primary columns, rely on each other, particularly shift Type defines the area, start and the length

And that leads me to make a table that defines shift types by a id allowing for the data to be nicely split up making our database fully normalized... unless there's a 4<sup>th</sup> form somewhere...



And like all the others here is a example



HAPPY HOLIDAYS and have a wonderful break!!!!