

Group Data Project

Hunter Beyer, Jose Gonzalez, Brendan Voight
IS 160 - Database Management

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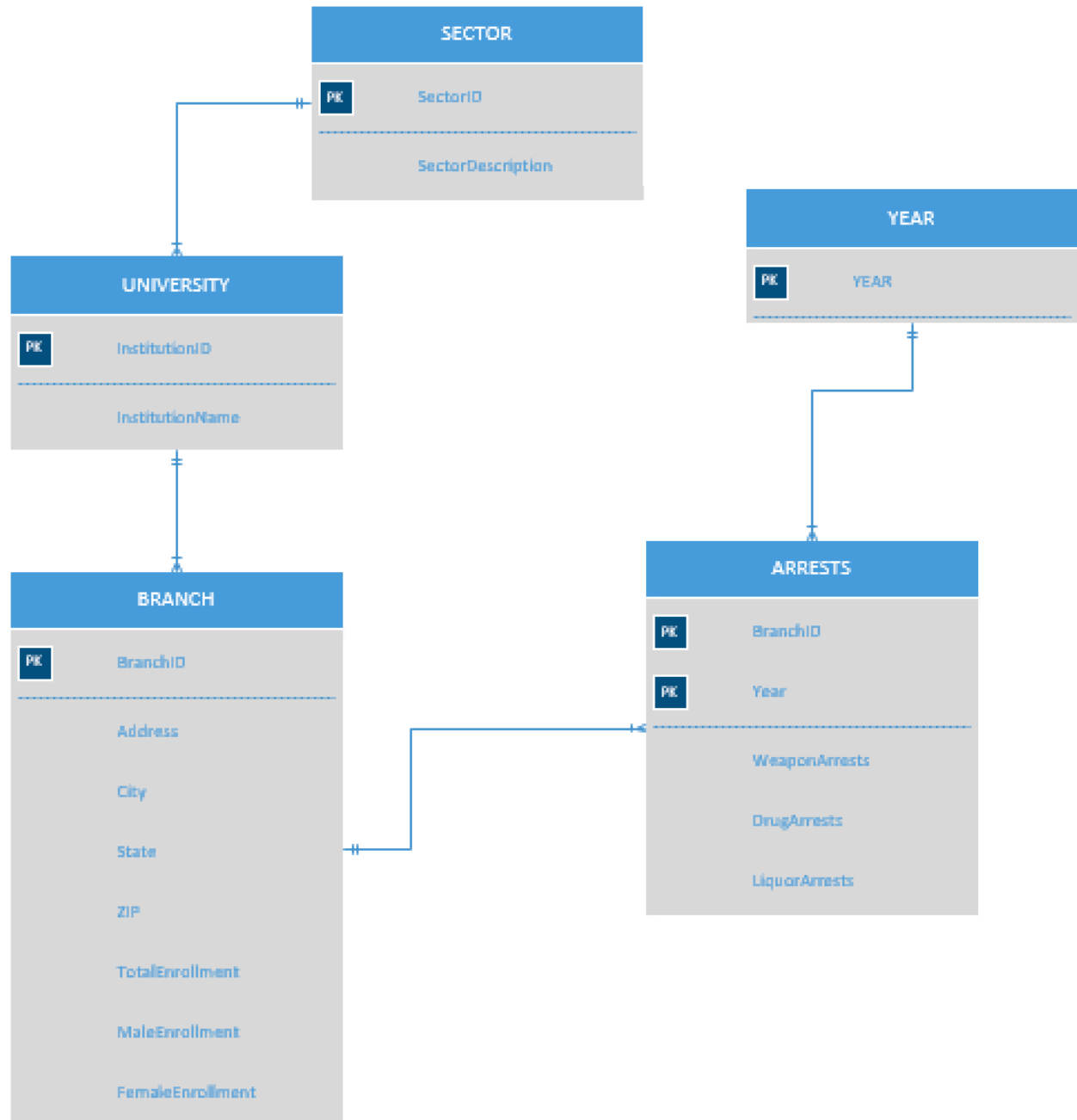
Deliverable #1

Introduction

The purpose of the database we will be developing is to keep track of, organize, and analyze the number of arrests related to alcohol, drug, and physical crimes that occur on college campuses all across the United States. It will be developed in such a way that the institutions, crimes, and numbers of arrests will be readily available and easy to make adjustments to.

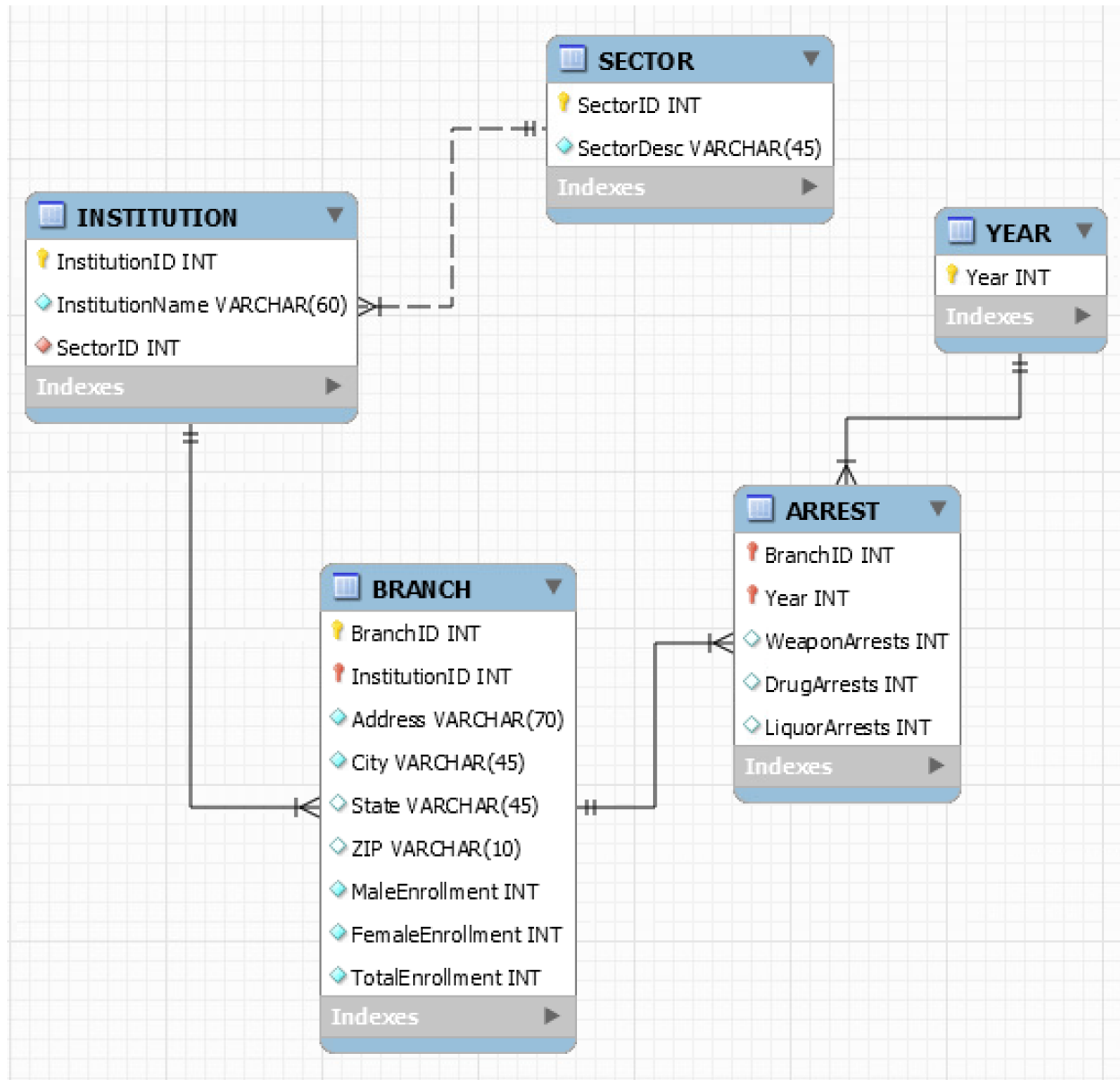
The dataset we will be using was found on data.gov and was provided by IT Innovative Solutions on January 31st of this year. It is organized by each college branch's unique ID number, and contains their addresses, enrollment of both men and women, what type of institution they are, and the total number of arrests for the years 2014, 2015, and 2016 organized by type of crime.

Data Modeling



Deliverable #2

Database Design



Deliverable #3

Tables & Data

YEAR Table

```
CREATE TABLE YEAR(
    Year          INT          NOT NULL,
    CONSTRAINT    YEARPK      PRIMARY KEY(Year));
```

```
INSERT INTO YEAR
(Year)
VALUES('2014');

INSERT INTO YEAR
(Year)
VALUES('2015');

INSERT INTO YEAR
(Year)
VALUES('2016');
```

Year
2014
2015
2016
NULL

SECTOR Table

```
CREATE TABLE SECTOR(
    SectorID      INT          NOT NULL,
    SectorDesc    VARCHAR(30)  NOT NULL,
    CONSTRAINT    SECTORPK     PRIMARY KEY(SectorID));
```

```
INSERT INTO SECTOR
(SectorID, SectorDesc)
VALUES('1', 'Public 4-year');

INSERT INTO SECTOR
(SectorID, SectorDesc)
VALUES('2', 'Private non-profit 4-year');

INSERT INTO SECTOR
(SectorID, SectorDesc)
VALUES('3', 'Private for-profit 4-year');

INSERT INTO SECTOR
(SectorID, SectorDesc)
VALUES('4', 'Public 2-year');

INSERT INTO SECTOR
(SectorID, SectorDesc)
VALUES('5', 'Private non-profit 2-year');

INSERT INTO SECTOR
(SectorID, SectorDesc)
VALUES('6', 'Private for-profit 2-year');

INSERT INTO SECTOR
(SectorID, SectorDesc)
VALUES('7', 'Public <2-year');

INSERT INTO SECTOR
(SectorID, SectorDesc)
VALUES('8', 'Private non-profit <2-year');

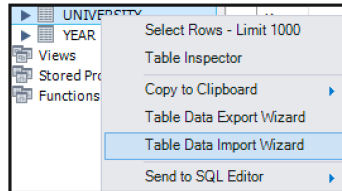
INSERT INTO SECTOR
(SectorID, SectorDesc)
VALUES('9', 'Private for-profit <2-year');
```

SectorID	SectorDesc
1	Public 4-year
2	Private non-profit 4-year
3	Private for-profit 4-year
4	Public 2-year
5	Private non-profit 2-year
6	Private for-profit 2-year
7	Public <2-year
8	Private non-profit <2-year
9	Private for-profit <2-year
NULL	NULL

UNIVERSITY Table

```
CREATE TABLE UNIVERSITY(
  InstitutionID INT NOT NULL AUTO_INCREMENT,
  SectorID INT NOT NULL,
  InstitutionName VARCHAR(45) NOT NULL,

  CONSTRAINT UNIVERSITYPK PRIMARY KEY(InstitutionID),
  CONSTRAINT UNIVERSITYFK FOREIGN KEY(SectorID)
  REFERENCES SECTOR(SectorID) ON UPDATE CASCADE);
```

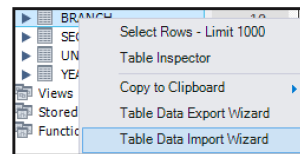


InstitutionID	InstitutionName	SectorID
1	Alabama A & M University	1
2	University of Alabama at Birmingham	1
3	Amridge University	2
4	University of Alabama in Huntsville	1
5	Alabama State University	1
6	The University of Alabama	1
7	Central Alabama Community College	4
8	Athens State University	1
9	Auburn University at Monticello	1
10	Auburn University	1
11	Birmingham Southern College	2
12	Chattahoochee Valley Community College	4
13	Concordia College Alabama	2
14	South University-Monticello	3
15	Enterprise State Community College	4
16	James H. Faulkner State Community College	4
17	Faulkner University	2
18	Gadsden State Community College	4

BRANCH Table

```
CREATE TABLE BRANCH(
  BranchID INT NOT NULL,
  BranchName VARCHAR(100) NOT NULL,
  BranchCampus VARCHAR(100) NOT NULL,
  Address VARCHAR(100) NOT NULL,
  City VARCHAR(50) NOT NULL,
  State VARCHAR(30),
  ZIP VARCHAR(11),
  SectorID INT NOT NULL,
  MaleEnrollment INT NOT NULL,
  FemaleEnrollment INT NOT NULL,
  TotalEnrollment INT NOT NULL,

  CONSTRAINT BRANCHPK PRIMARY KEY(BranchID),
  CONSTRAINT BRANCHFK FOREIGN KEY(SectorID)
  REFERENCES SECTOR(SectorID) ON UPDATE CASCADE);
```



BranchID	BranchName	BranchCampus	Address	City
100654001	Alabama A & M University	Main Campus	4900 MERIDIAN ST	NORMAL
100663001	University of Alabama at Birmingham	Main Campus	ADMINISTRATION BLDG SUITE 1070, 701 20th ...	BIRMINGHAM
100663002	University of Alabama at Birmingham	Huntsville Regional Medical Campus	301 Governors Drive SW	Huntsville
100690001	Amridge University	Main Campus	1200 TAYLOR RD	MONTGOMERY
100706001	University of Alabama in Huntsville	Main Campus	301 SPARKMAN DR	HUNTSVILLE
100724001	Alabama State University	Main Campus	915 SOUTH JACKSON ST	MONTGOMERY
100751001	The University of Alabama	Main Campus	1110 Jackson Ave	TUSCALOOSA
100751002	The University of Alabama	University of Alabama Gadsden Center	P.O. Box 1280	Gadsden
100760001	Central Alabama Community College	Alexander City Campus	1675 Cherokee Rd	Alexander City

State	ZIP	SectorID	MaleEnrollment	FemaleEnrollment	TotalEnrollment
AL	35762	1	2413	3446	5859
AL	352940110	1	7590	11945	19535
AL	35801	1	7590	11945	19535
AL	361173553	2	233	364	597
AL	35899	1	4833	3635	8468
AL	361040271	1	1952	3366	5318
AL	354870180	1	16589	21074	37663
AL	359021280	1	16589	21074	37663
AL	35010	4	769	1000	1769

ARRESTS Table

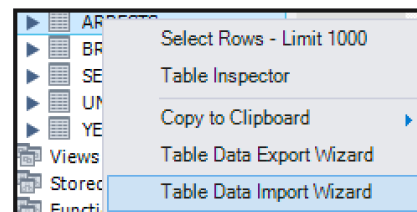
```

CREATE TABLE ARRESTS(
  BranchID      INT      NOT NULL,
  Year          INT      NOT NULL,
  WeaponArrests INT,
  DrugArrests   INT,
  LiquorArrests INT,

  CONSTRAINT ARRESTSPK PRIMARY KEY(BranchID, Year),
  CONSTRAINT ARRESTSFK01 FOREIGN KEY(BranchID)
    REFERENCES BRANCH(BranchID) ON UPDATE CASCADE,
  CONSTRAINT ARRESTSFK02 FOREIGN KEY(Year)
    REFERENCES YEAR(Year) ON UPDATE CASCADE);

```

BranchID	Year	WeaponArrests	DrugArrests	LiquorArrests
100654001	2014	6	17	0
100654001	2015	14	38	2
100654001	2016	6	22	0
100663001	2014	0	29	0
100663001	2015	5	27	0
100663001	2016	0	16	0
100663002	2014	0	0	0
100663002	2015	0	0	0
100663002	2016	0	0	0
100690001	2014	0	0	0
100690001	2015	0	0	0



Deliverable #4

Queries

The dataset can be used to view the total arrests from year to year for any specific US college campus - this can be useful for calculating averages + to see if arrests are going up/down/staying steady at a particular school.

```
SELECT A.BranchId, BranchName, Year, WeaponArrests, DrugArrests, LiquorArrests
FROM ARRESTS AS A JOIN BRANCH AS B
ON A.BranchID = B.BranchID
WHERE BranchName = 'Drake University'
```

BranchId	BranchName	Year	WeaponArrests	DrugArrests	LiquorArrests
153269001	Drake University	2014	1	9	3
153269001	Drake University	2015	0	1	3
153269001	Drake University	2016	0	2	4

Sectors are the “type” of school - private 4-year for-profit, public 2-year non-profit, etc. A user of this database may want to see if the sector of a campus and the average number of arrests have any correlation.

```
SELECT DISTINCT SectorID, AVG(WeaponArrests) AS AvgWeaponArrests, AVG(DrugArrests) AS AvgDrugArrests,
AVG(LiquorArrests) AS AvgLiquorArrests
FROM BRANCH AS B JOIN ARRESTS AS A
ON B.BranchID = A.BranchID
GROUP BY SectorID
ORDER BY SectorID;
```

SectorID	AvgWeaponArrests	AvgDrugArrests	AvgLiquorArrests
1	0.4166	9.1678	10.3773
2	0.0622	0.8004	0.9360
3	0.0164	0.1057	0.0314
4	0.1009	0.6626	0.4877
5	0.0784	0.3786	0.1759
6	0.0093	0.0419	0.0066
7	0.0816	0.5765	0.0969
8	0.0045	0.0090	0.0090
9	0.0021	0.0108	0.0030

Database users may want to view the average enrollment of males and females per sector to see if the type of college influences what gender decides on which sector type.

```
SELECT DISTINCT SectorID, AVG(MaleEnrollment) AS AvgMale, AVG(FemaleEnrollment) AS AvgFemale
FROM BRANCH
WHERE MaleEnrollment > FemaleEnrollment
GROUP BY SectorID
ORDER BY SectorID
```

SectorID	AvgMale	AvgFemale
1	13591.0302	11571.8113
2	3602.7711	1605.0228
3	1981.2750	1427.9313
4	3040.3320	2368.5270
5	331.9737	158.8947
6	478.0705	88.7436
7	322.1125	174.2750
8	118.6800	35.2000
9	209.8697	56.5172

This query displays the arrests per year for each institution in alphabetical order. A database user may want to use something similar to this in order to see if, proportionally, larger universities are prone to more arrests.

```
SELECT BRANCH.BranchID, BranchName, Year, WeaponArrests, DrugArrests, LiquorArrests, TotalEnrollment
FROM BRANCH JOIN ARRESTS ON
BRANCH.BranchID = ARRESTS.BranchID
WHERE FemaleEnrollment > MaleEnrollment AND
LiquorArrests+DrugArrests+WeaponArrests <> 0
```

BranchID	BranchName	Year	WeaponArrests	DrugArrests	LiquorArrests	TotalEnrollment
100654001	Alabama A & M University	2014	6	17	0	5859
100654001	Alabama A & M University	2015	14	38	2	5859
100654001	Alabama A & M University	2016	6	22	0	5859
100663001	University of Alabama at Birmingham	2014	0	29	0	19535
100663001	University of Alabama at Birmingham	2015	5	27	0	19535
100663001	University of Alabama at Birmingham	2016	0	16	0	19535
100724001	Alabama State University	2014	3	35	0	5318
100724001	Alabama State University	2015	6	33	0	5318
100724001	Alabama State University	2016	1	31	0	5318
100751001	The University of Alabama	2014	1	109	25	37663
100751001	The University of Alabama	2015	1	84	10	37663

The database is also able to display particular campuses/colleges with a simple keyword search. This can be useful in searching for the college with the fewest arrests in a particular area/state.

```
SELECT A.BranchId, BranchName, Year, WeaponArrests, DrugArrests, LiquorArrests
FROM ARRESTS AS A JOIN BRANCH AS B
ON A.BranchID = B.BranchID
WHERE BranchName = 'Drake University' OR BranchName = 'Grand View University'
OR BranchName = 'Iowa State University';
```

BranchId	BranchName	Year	WeaponArrests	DrugArrests	LiquorArrests
153269001	Drake University	2014	1	9	3
153269001	Drake University	2015	0	1	3
153269001	Drake University	2016	0	2	4
153375001	Grand View University	2014	0	0	0
153375001	Grand View University	2015	0	0	0
153375001	Grand View University	2016	0	1	0
153603001	Iowa State University	2014	1	112	181
153603001	Iowa State University	2015	1	96	175
153603001	Iowa State University	2016	2	128	173
153603002	Iowa State University	2014	0	0	0

Views

Users may want to view the total arrests for the three years per state rather than school, to see if the state has an impact on the number of arrests. A view was created to combine these values together.

```
CREATE VIEW ArrestsPerState AS
SELECT Br.State, SUM(Ar.WeaponArrests) AS TotalWeaponArrests, SUM(Ar.DrugArrests) AS TotalDrugArrests,
SUM(Ar.LiquorArrests) AS TotalLiquorArrests
FROM BRANCH AS Br, ARRESTS AS Ar
WHERE Br.BranchID = Ar.BranchID
GROUP BY Br.State;
```

AK	5	33	105
AL	87	936	238
AR	48	577	577
AS	0	0	0
AZ	15	1787	2066
CA	656	3045	1787
CO	63	1942	2123
CT	36	1144	594
DC	18	52	14
DE	12	206	228
FL	112	2250	1108
FM	1	2	67
GA	186	1747	1477
GU	0	0	0

This database also has the capability to display the arrests per year in order by the name of each campus. This can be useful to compare overall crime in the US by year and college.

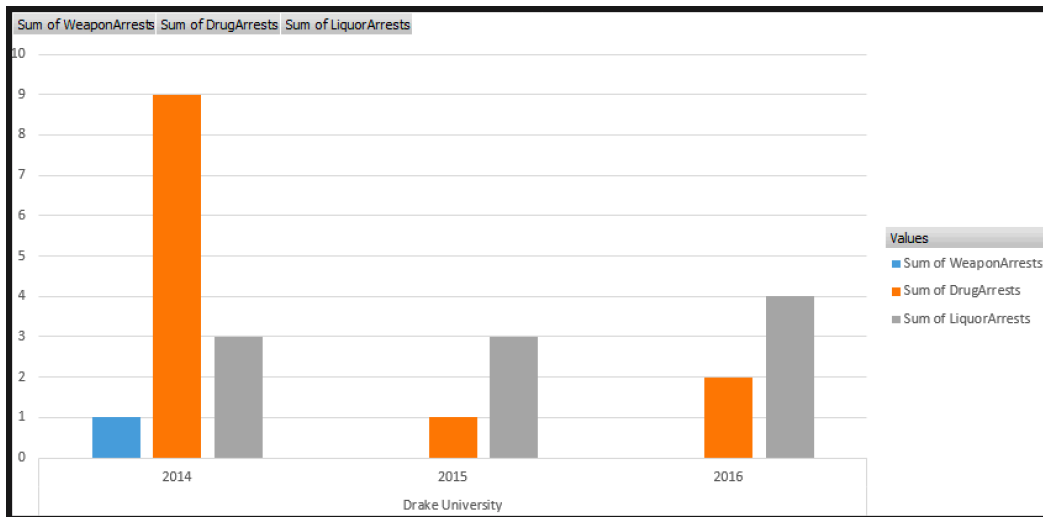
```
CREATE VIEW ArrestsPerYear AS
SELECT DISTINCT Br.BranchName, Ar.Year, SUM(Ar.WeaponArrests) AS TotalWeaponArrests, SUM(Ar.DrugArrests) AS TotalDrugArrests, SUM(Ar.LiquorArrests) AS TotalLiquorArrests
FROM BRANCH AS Br, ARRESTS AS Ar
WHERE Br.BranchID = Ar.BranchID
GROUP BY Ar.Year, Br.BranchName;
```

BranchName	Year	TotalWeaponArrests	TotalDrugArrests	TotalLiquorArrests
A T Still University of Health Sciences	2014	0	0	0
Aaniiih Nakoda College	2014	0	0	0
Abcott Institute	2014	0	0	0
Abdill Career College Inc	2014	0	0	0
Abilene Christian University	2014	0	4	2
Abington Memorial Hospital Dixon School of Nur...	2014	0	0	0
Abraham Baldwin Agricultural College	2014	1	6	9
Academia Serrant Inc	2014	0	0	0
Academv College	2014	0	0	0
Academv Di Capelli-School of Cosmetoloov	2014	0	0	0
Academv di Firenze	2014	0	0	0
Academv for Careers and Technoloov	2014	0	0	0
Academv for Five Element Acupuncture	2014	0	0	0
Academv for Jewish Religion-California	2014	0	0	0
Academv for Nursing and Health Occupations	2014	0	1	0

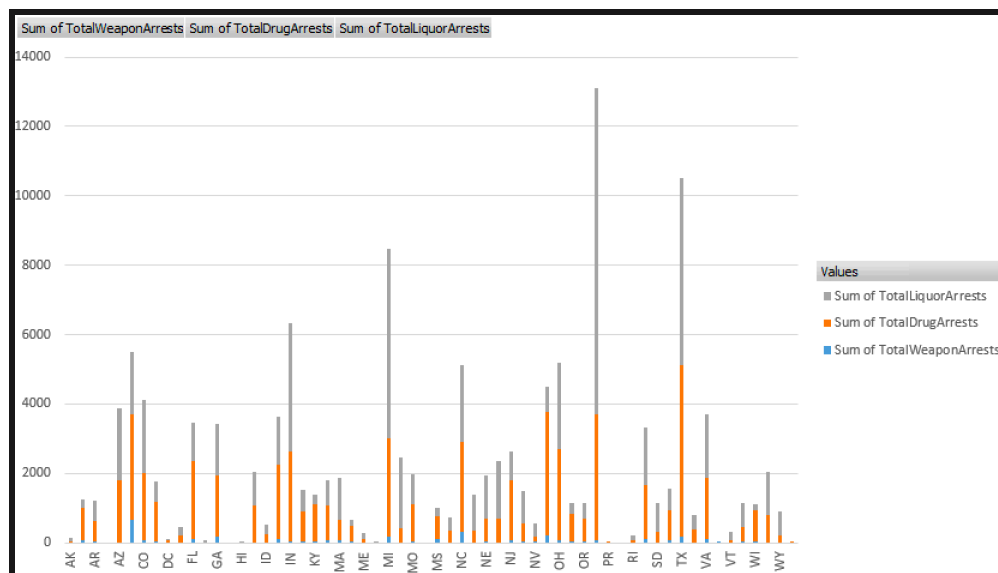
Deliverable #5

Visualization

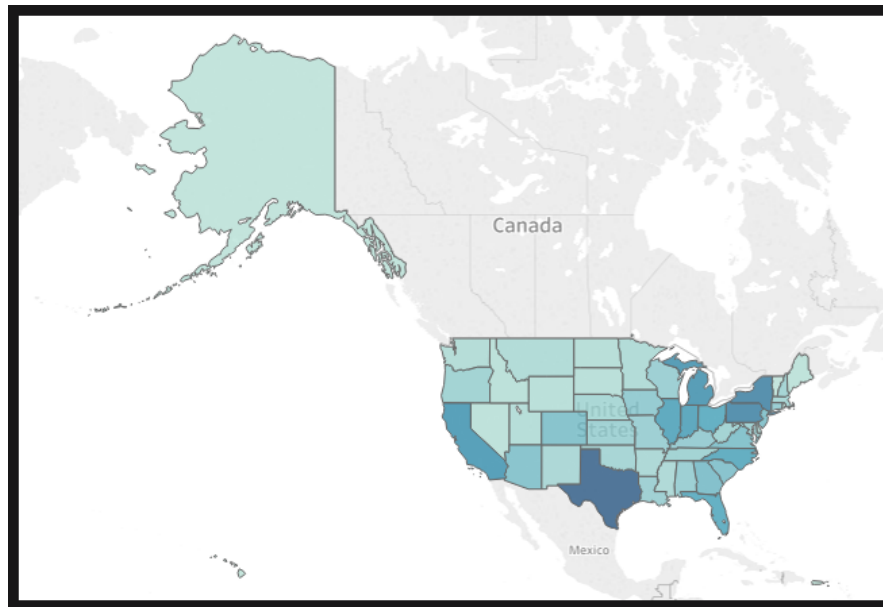
Excel



Total arrests on Drake's campus for each available year



Proportions of each kind of arrest by state

PowerBI

Density/quantity of arrests for each state with available data (Did not provide a key)

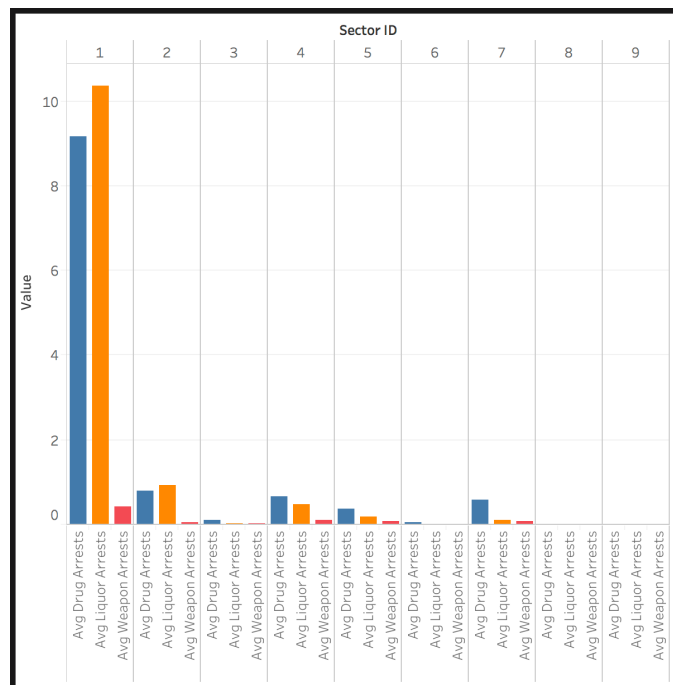


Proportions of each kind of arrest by year

Tableau

Branch Name					
Drake University	Year	2017			
		2016	2.0	4.0	0.0
		2015	1.0	3.0	0.0
		2014	9.0	3.0	1.0
		2013			
Grand View University	Year	2017			
		2016	1.0	0.0	0.0
		2015	0.0	0.0	0.0
		2014	0.0	0.0	0.0
		2013			
Iowa State University	Year	2017			
		2016	128.0	173.0	2.0
		2015	96.0	175.0	1.0
		2014	112.0	181.0	1.0
		2013			
		Drug Arrests	Liquor Arrests	Weapon Arrests	

Total number of arrests for various campuses in central Iowa



Average for each type of arrest organized by sector