A. Feasibility Analysis

1. No, I do not have enough data to identify KPI to improve business, education, lifestyle, and safety of Halifax region. Data found on given websites, lacks connectivity between them, thus I am not able to analyse data to find KPIs. Few of the datasets can be linked to other datasets but doesn't provide enough insight.

2. I have listed of all the datasets used in the project [1][2][3].

Name: Business Establishment 2010 - 2011

URL: https://data.novascotia.ca/Business-and-Industry/-ARCHIVED-Business-Establishments-2010-2011/wa8g-ji9a

Reason: This dataset provides vital information related to employment in various industries, type and size of industries.

Name: Nova Scotia Public School Contact Information

URL: https://data.novascotia.ca/Education-Primary-to-Grade-12/Nova-Scotia-Public-School-Contact-Information/iyap-ttn5/data

Reason: This dataset provides contact information, board information and school code of all public schools in Nova Scotia.

Name: Nova Scotia Public School Enrolment by Board and School

URL: https://data.novascotia.ca/Education-Primary-to-Grade-12/Nova-Scotia-Public-School-Enrolment-by-Board-and-S/cjnf-ywvt

Reason: this dataset provides relationship between board and public school as well as number of students enrolled by year.

Name: HRM Parks

URL: http://catalogue-hrm.opendata.arcgis.com/datasets/3df29a3d088a42d890f11d027ea1c0be_0/data

Reason: This dataset contains all information related to parks like address, size of park, owner of that park, etc. Which is useful to know lifestyle of people.

Name: HRM Parks Recreation Features

URL: http://catalogue-hrm.opendata.arcgis.com/datasets/52127546a407426ba67c359640353ca7_0/data

Reason: This dataset provides detailed information of each park, like types of activities in park, address etc.

Name: Crime

URL: http://catalogue-hrm.opendata.arcgis.com/datasets/f6921c5b12e64d17b5cd173cafb23677_0

Reason: This dataset provides type and location of crimes happened, which is useful to measure safety level in that region.

Name: Hospitals

URL: https://data.novascotia.ca/Health-and-Wellness/Hospitals/2kxr-ajui

Reason: This dataset contains all the name and location of hospitals, which can be useful for improving emergency services, thus safer environment level.

Name: Accessible Parking Spots

URL: http://catalogue-hrm.opendata.arcgis.com/datasets/90be8d1040e54793a29a80d1f94d942e_0

Reason: This dataset provides parking spot and timing for people with disabilities, which is related safety and lifestyle of people.

Name: Annual Numbers and Rates of Accident Fatalities in NS by Zone of Residence

URL: https://data.novascotia.ca/Health-and-Wellness/Annual-Numbers-and-Rates-of-Accident-Fatalities-in/nbw4-zth5

Reason: This dataset contains accidents happened in different parts, which can be used as indicator of safety of that areas.

Name: Aquaculture Production, Value, Employment Data by County

URL: https://data.novascotia.ca/Business-and-Industry/Aquaculture-Production-Value-Employment-Data-by-Co/v2ex-ev63

Reason: This database provides employment and production involved with aquaculture industries, which provides business opportunities.

Name: Street Name Routes

URL: http://catalogue-hrm.opendata.arcgis.com/datasets/6d93ecf9e2a348b891e1d5f21c436fe1_0

Reason: This data set is very important to connect all other datasets and to provide locations with routes.

3. Programming languages/tools used are as follow:

- M formula language – to transform data
- Power BI Desktop/ DAX Query – to extract and transform data
- Microsoft Excel – to extract and load data

4. list of entity-set identified from datasets:

- From dataset <Aquaculture_Production__Value__Employment_Data_by_County> found 8 out of 8 attributes useful and created 2 entity sets <aquaculture> and <aqua county>.
- From dataset <Accessible_Parking_Spots> found 5 out of 21 attributes useful and created 2 entity sets <Accessible_Parking_Spots> and <Accessible_Parking_Qualifier>.
- From dataset <Annual_Numbers_and_Rates_of_Accident_Fatalities_in_NS_by_Zone_of_Residence> found 4 out of 4 attributes useful and created entity set <Annual_Accident_Fatalitie>.
- From dataset <Business_Establishments_2010-2011> found 7 out of 9 attributes useful and created 2 entity sets <Business_Establishments_2010-2011> and <Business geography>.
- From dataset <Crime> found 5 out of 10 attributes useful and created entity set <Crime>.
- From dataset <Hospitals> found 8 out of 9 attributes useful and created entity set <hospitals>.
- From dataset <HRM_Parks> found 4 out of 21 attributes useful and created entity set <HRM_Parks>.
- From dataset <HRM_Park_Recreation_Features> found 6 out of 28 attributes useful and created 2 entity sets <hrm_park_rec_type> and <hrm_park_recreation_features>.
- From dataset <Street_Name_Routes> found 6 out of 11 attributes useful and created entity set <Street_Name_Routes>.
- From dataset <Nova_Scotia_Public_School_Contact_Information> found 7 out of 14 attributes useful and created 2 entity set <Nova_Scotia_Public_School_Contact_Information> and <board_code_info>.
- From dataset <Nova_Scotia_Public_School_Enrolment_by_Board_and_School> found 3 out of 6 attributes useful and created entity set <school_total_by_year>.

5. All the entities are strong entities.

B. Data Modelling

Initial conceptual design:

1. Crime and Safety

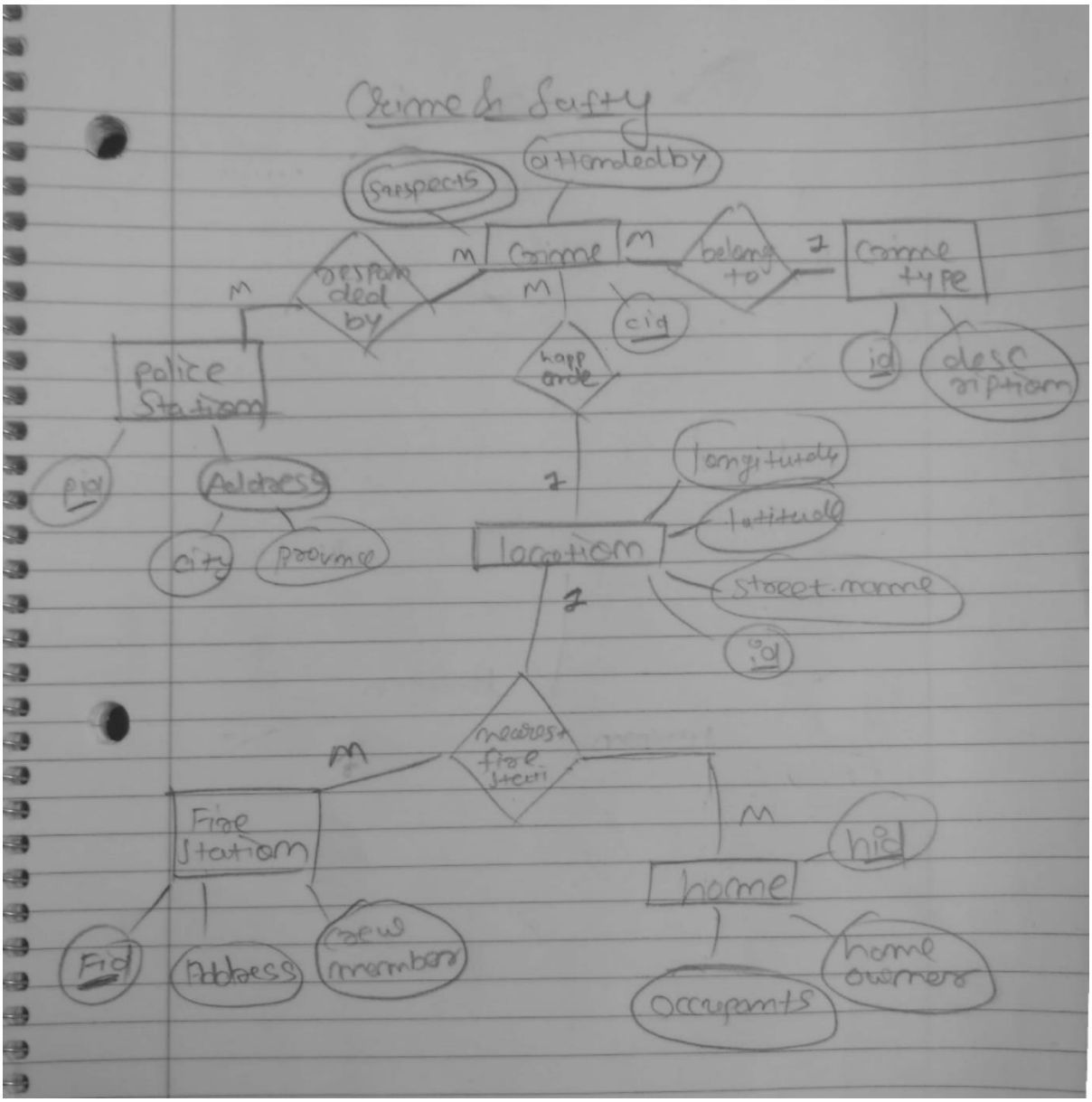


Figure 1: Crime and Safety

2. Education

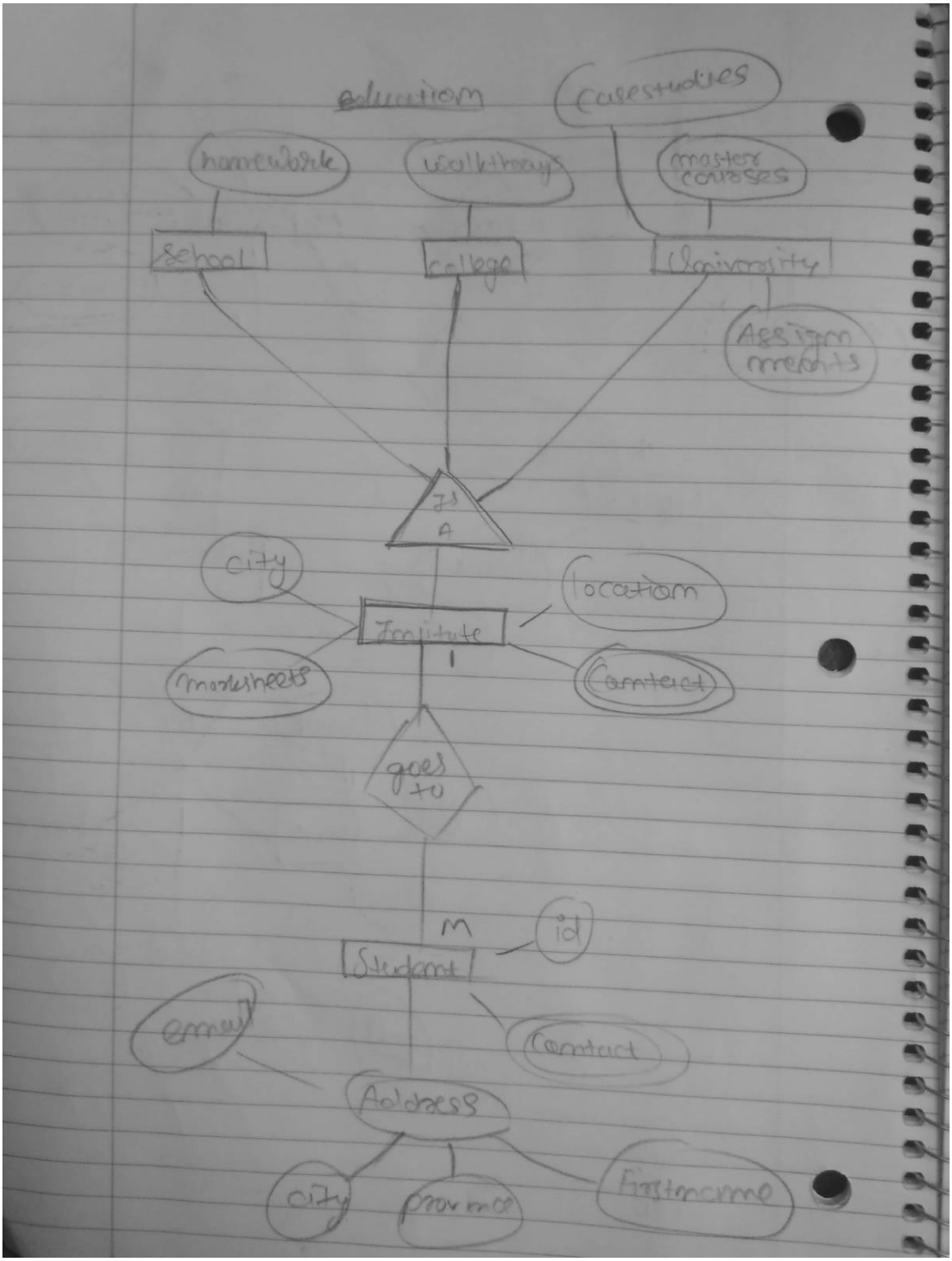


Figure 2: Education

3. Lifestyle

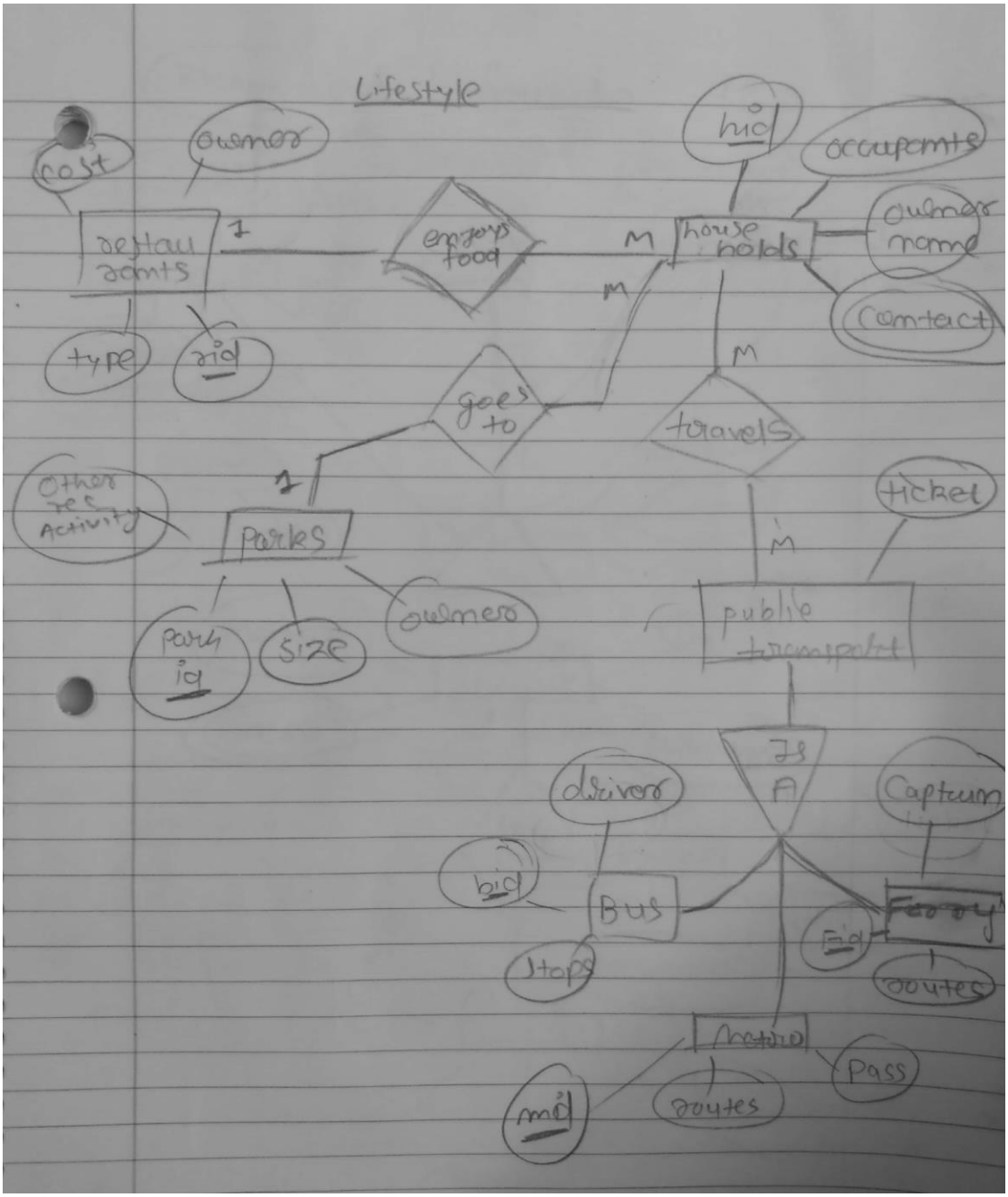


Figure 3: Lifestyle

4. Business

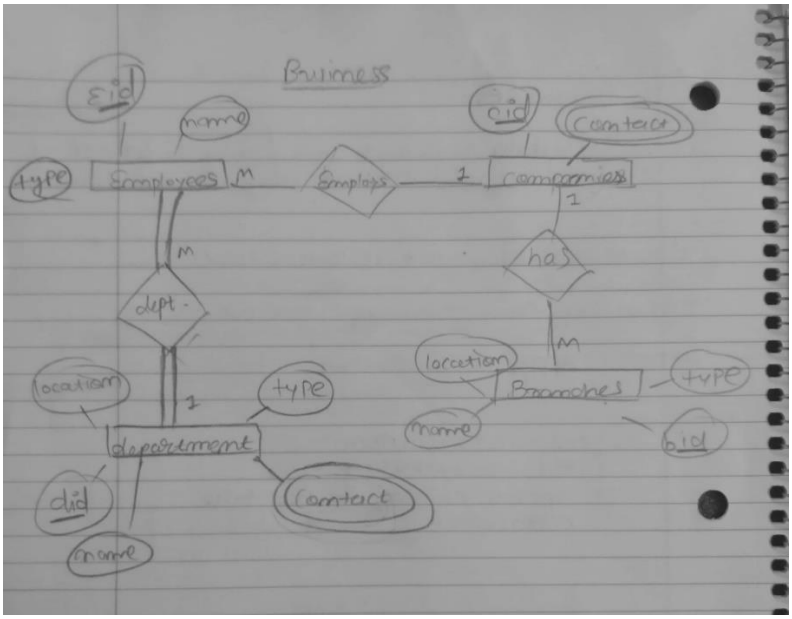


Figure 4: Business

Final design:

- Used Draw.io website to create ERD [4].

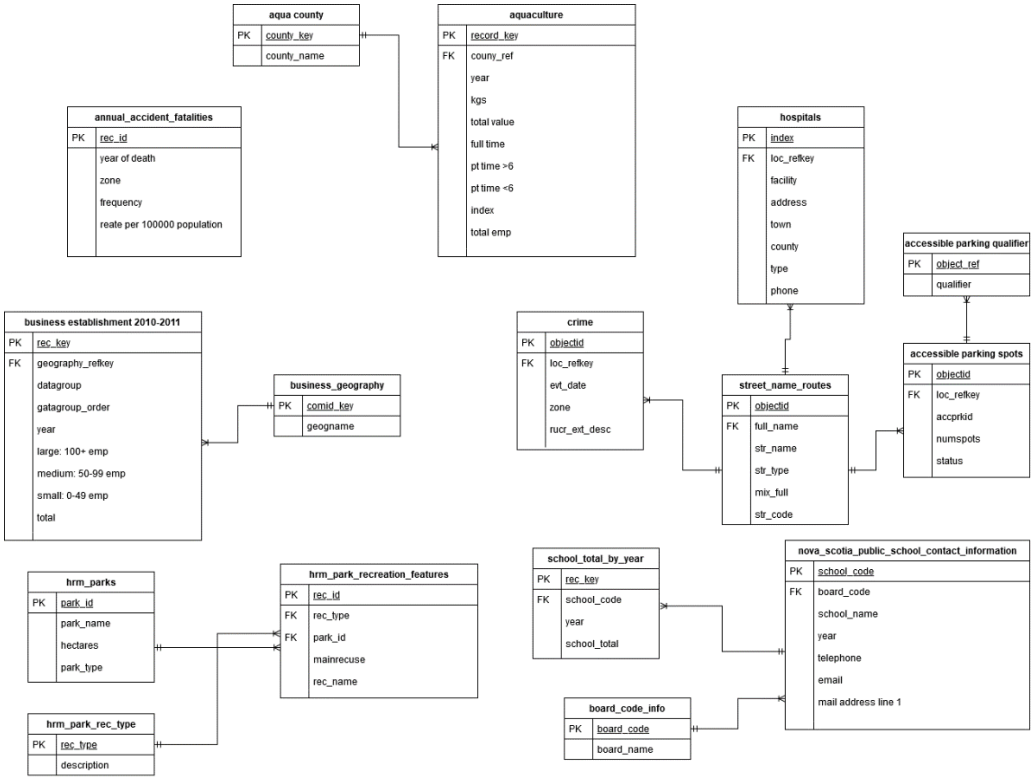


Figure 5: Final design

C. Query

1. Which business organization or type of business organization has highest employees?

Query: "select *datagroup, year, sum(total) as totalemp FROM assignment1.`business_establishments_2010-2011` where Geography_refkey <> 'can' group by year, Datagroup order by totalemp desc; "*

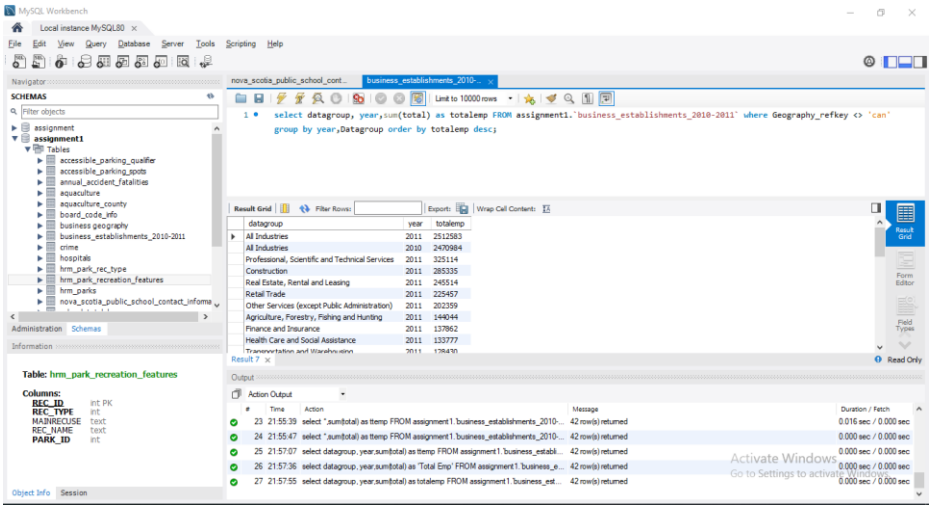


Figure 6: Organization that has highest number of employees

2. Provide the name of the park that has most recreational features?

Query: "*SELECT REC_NAME,PARK_ID,count(REC_TYPE) as count_of_recreation_features FROM assignment1.hrm_park_recreation_features group by PARK_ID order by count_of_recreation_features desc;*"

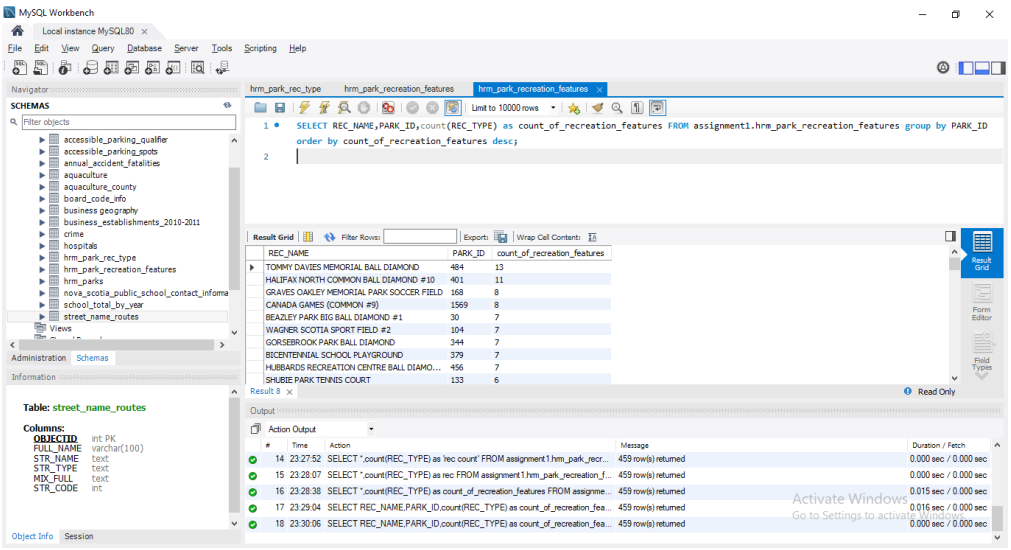


Figure 7: Park name that has the greatest number of features

3. Which street in Halifax region has more number of reported crimes?

Query: "*SELECT count(crime.OBJECTID) as crimes ,street_name_routes.FULL_NAME FROM assignment1.crime inner join street_name_routes on crime.loc_refkey = street_name_routes.OBJECTID group by loc_refkey order by crimes desc;*"

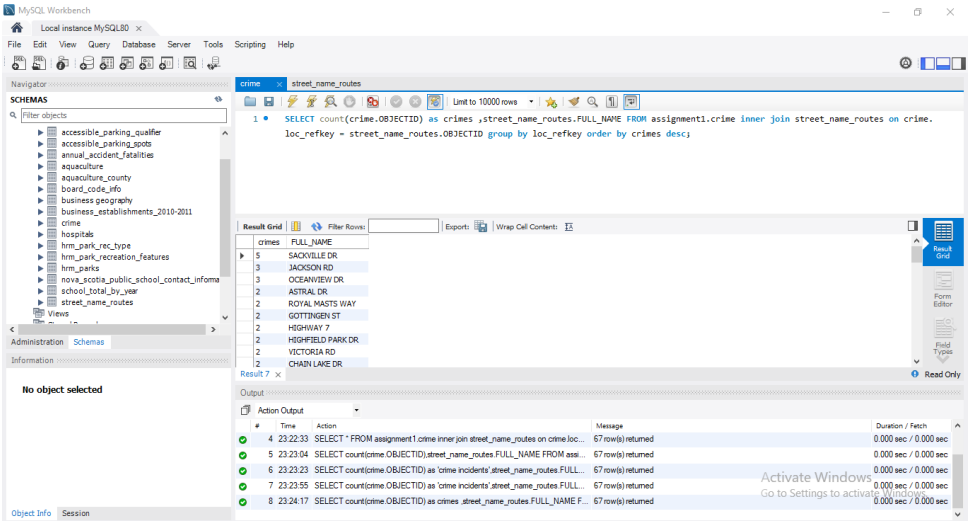


Figure 8: Street name that has most reported number of crimes

D. Normalization:

After applying normalization all entity-sets are in 3NF. Following are the steps, performed on each entity-set to convert them into 3NF.

1. Dataset <Aquaculture_Production__Value__Employment_Data_by_County>
   - No primary key defined.
   - Not in 1NF.

County	Year	KGS	Total Value	Full Time	PT Employ. (< 6 Mth)	PT Employ. (> 6 Mth)	Total Employ.
Annapolis	2017						
Annapolis	2018						
Antigonish	2017	8752	64982.78	1	6	0	7
Antigonish	2018						
Cape Breton	2017						
Cape Breton	2018						
Colchester	2017	45641	375097.58	5	5	6	16
Colchester	2018	40963	211864.63	6	8	2	16
Cumberland	2017	157422	487317	20	16	5	41
Cumberland	2018	193704	1626901.4	19	11	3	33

After normalization:

- Primary key “Record_key” is added in entity-set.

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap

Record_key	County_ref	Year	KGS	Total Value	Full Time	PT Employ. (< 6 Mth)	PT Mt
1	2	2017	8752	64982.78	1	6	0
2	4	2017	45641	375097.58	5	5	6
3	5	2017	157422	487317	20	16	5
4	10	2017	320865	2002983	14	17	3
5	12	2017	1205938	10323356.2	10	5	1
6	13	2017	212872	2957485.52	18	30	7
7	15	2017	19390	227435	3	25	3
8	16	2017	5680773	57437181.8	34	4	63
9	17	2017	862970	1494112	6	29	16
10	19	2017	13355926	116046956.5	185	192	158
11	4	2018	40963	211864.63	6	8	2
12	5	2018	193704	1626901.4	19	11	3
13	10	2018	230887	614387	21	38	2

- Created new entity-set <Aquaculture_County> to remove rows with null values.

Result Grid | Filter Rows:

County_Key	County
1	Annapolis
2	Antigonish
3	Cape Breton
4	Colchester
5	Cumberland
6	Digby
7	Guysbrough
8	Halifax
9	Hants
10	Inverness

- Entity-set <Aquaculture_County> and <Aquaculture_Production_Value_Employment_Data_by_County> are now in 3NF.

2. Dataset <accessible_parking_spots>
   - "OBJECTID" is not defined as primary key.
   - Not in 1FN.

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

OBJECTID	ACCPRKID	STREET_NAME	NUMSPOTS	QUALIFIER	STATUS
10951	AP52	HESTER ST	1		In Service
10952	AP74	ARGYLE ST	2		In Service
10953	AP81	BAUER ST	1		In Service
10954	AP79	BARRINGTON ST	3	Sunday Only	In Service
10955	AP50	DUNDAS ST	2	Sunday Only	In Service
10956	AP48	HAWTHORNE ST	2		In Service
10957	AP76	ARGYLE ST	1		In Service
10958	AP69	REGENCY DR	2		In Service
10959	AP56	QUEEN ST	1		In Service
10960	AP51	WYSE RD	1		In Service
10961	AP60	PORTLAND ST	2		In Service
10962	AP70	ELMWOOD AVE	1		In Service
10963	AP58	QUEEN ST	1		In Service
10964	AP82	BEDFORD ROW	2		In Service
10965	AP77	BARRINGTON ST	2		In Service

After normalization:

- Defined "OBJECTID" as primary key.

Result Grid | Filter Rows: | Edit:

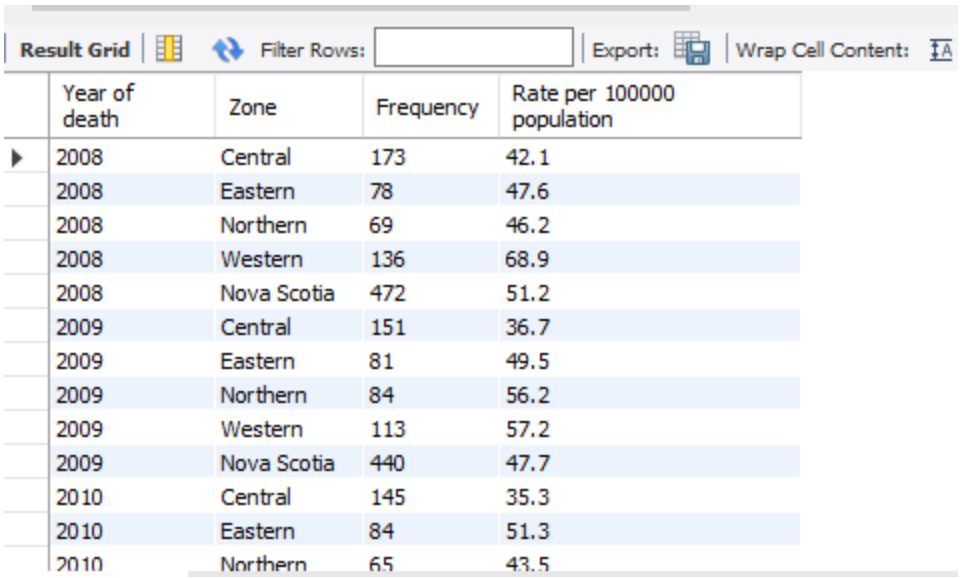
OBJECTID	ACCPRKID	STREET_NAME	NUMSPOTS	STATUS
10951	AP52	HESTER ST	1	In Service
10952	AP74	ARGYLE ST	2	In Service
10953	AP81	BAUER ST	1	In Service
10954	AP79	BARRINGTON ST	3	In Service
10955	AP50	DUNDAS ST	2	In Service
10956	AP48	HAWTHORNE ST	2	In Service
10957	AP76	ARGYLE ST	1	In Service
10958	AP69	REGENCY DR	2	In Service
10959	AP56	QUEEN ST	1	In Service
10960	AP51	WYSE RD	1	In Service
10961	AP60	PORTLAND ST	2	In Service
10962	AP70	ELMWOOD AVE	1	In Service
10963	AP58	QUEEN ST	1	In Service

- Separated column “Qualifier” and created new entity-set <accessible_parking_qualifier> having foreign key “OBJECT_ref”.

Result Grid | Filter Rows:

OBJECT_ref	QUALIFIER
10954	Sunday Only
10955	Sunday Only
10968	Saturday & Sunday Only
10971	8am-6pm Mon-Fri
11010	Sunday Only
11054	6am-6pm Mon-Fri
11056	Sunday Only
11072	8am-6pm Mon-Fri
11089	Sunday Only
11093	Sunday Only
11095	Sunday Only
11107	Sunday Only

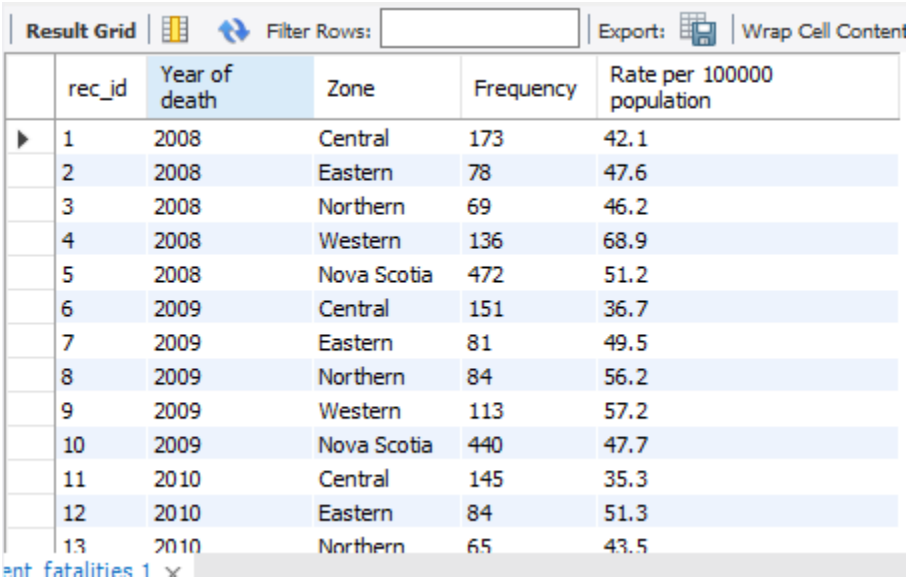
3. Dataset <annual_accident_fatalities>
   - No primary key defined.



Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Year of death	Zone	Frequency	Rate per 100000 population
2008	Central	173	42.1
2008	Eastern	78	47.6
2008	Northern	69	46.2
2008	Western	136	68.9
2008	Nova Scotia	472	51.2
2009	Central	151	36.7
2009	Eastern	81	49.5
2009	Northern	84	56.2
2009	Western	113	57.2
2009	Nova Scotia	440	47.7
2010	Central	145	35.3
2010	Eastern	84	51.3
2010	Northern	65	43.5

- Primarr key “rec_id” is created in entity-set <annual_accident_fatalities>.



Result Grid | Filter Rows: | Export: | Wrap Cell Content

rec_id	Year of death	Zone	Frequency	Rate per 100000 population
1	2008	Central	173	42.1
2	2008	Eastern	78	47.6
3	2008	Northern	69	46.2
4	2008	Western	136	68.9
5	2008	Nova Scotia	472	51.2
6	2009	Central	151	36.7
7	2009	Eastern	81	49.5
8	2009	Northern	84	56.2
9	2009	Western	113	57.2
10	2009	Nova Scotia	440	47.7
11	2010	Central	145	35.3
12	2010	Eastern	84	51.3
13	2010	Northern	65	43.5

ent_fatalities 1

4. Dataset <business_establishments_2010-2011>
   - No primary key defined.
   - “ComID” repeated for each year as well as “GeogName”.

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

ComID	GeogName	Datagroup	Datagroup_Order	Year	Large: 100+ Employees	Medium: 50-99 Employees	Small: 0-49 Employees
pro9046	Manitoba	Retail Trade	8	2011	93	150	6503
can	Canada	All Industries	1	2010	22250	29196	2311414
can	Canada	All Industries	1	2011	21527	28801	2354995
cnt1201	Shelburne County	All Industries	1	2011	5	13	1313
cnt1201	Shelburne County	All Industries	1	2010	3	12	1357
cnt1202	Yarmouth County	All Industries	1	2011	17	21	2028
cnt1202	Yarmouth County	All Industries	1	2010	18	23	2031
cnt1203	Digby County	All Industries	1	2010	9	9	1330
cnt1203	Digby County	All Industries	1	2011	8	12	1277
cnt1204	Queens County	All Industries	1	2010	8	6	542
cnt1204	Queens County	All Industries	1	2011	8	7	528
cnt1205	Annapolis County	All Industries	1	2011	6	9	1294

After Normalization:

- Primary key “Rec_key” and “Geography_refkey”is created.

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

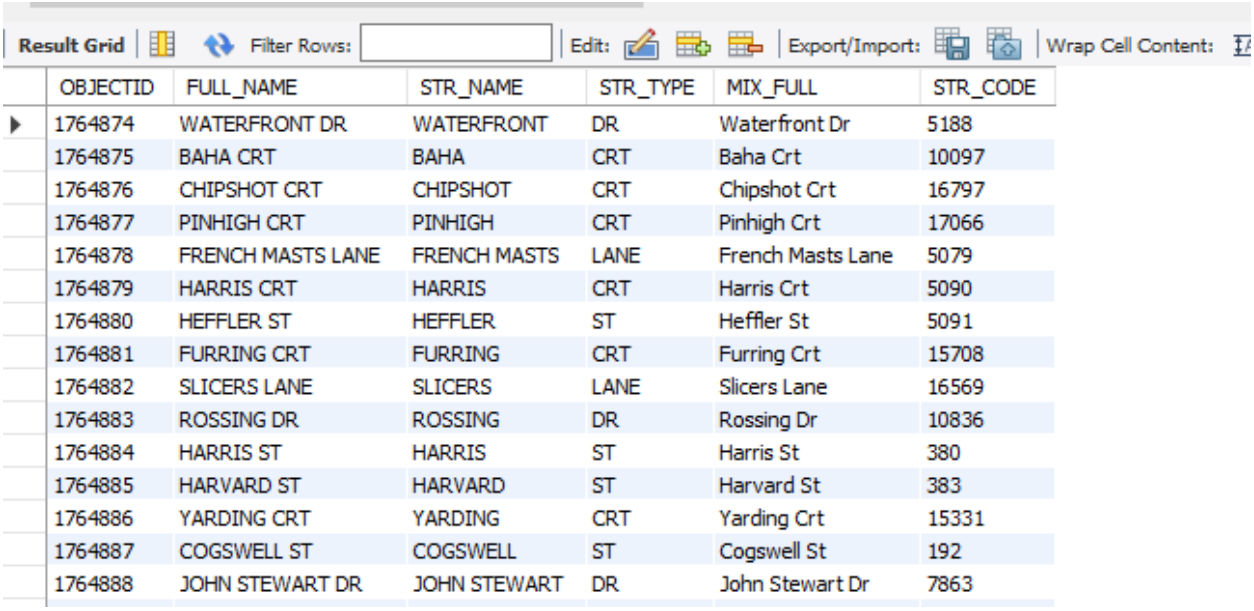
rec_key	Geography_refkey	Datagroup	Datagroup_Order	Year	Large: 100+ Employees	Medium: 50-99 Employees	Small: 0-49 Employees
1	pro9046	Retail Trade	8	2011	93	150	6503
2	can	All Industries	1	2010	22250	29196	2311414
3	can	All Industries	1	2011	21527	28801	2354995
4	cnt1201	All Industries	1	2011	5	13	1313
5	cnt1201	All Industries	1	2010	3	12	1357
6	cnt1202	All Industries	1	2011	17	21	2028
7	cnt1202	All Industries	1	2010	18	23	2031
8	cnt1203	All Industries	1	2010	9	9	1330
9	cnt1203	All Industries	1	2011	8	12	1277
10	cnt1204	All Industries	1	2010	8	6	542
11	cnt1204	All Industries	1	2011	8	7	528
12	cnt1205	All Industries	1	2011	6	9	1294
13	cnt1205	All Industries	1	2010	6	10	1021

- “GeogName” is moved to separate entity-set <business geography>.

Result Grid | Filter Rows:

ComID_key	GeogName
can	Canada
cnt1201	Shelburne County
cnt1202	Yarmouth County
cnt1203	Digby County
cnt1204	Queens County
cnt1205	Annapolis County
cnt1206	Lunenburg County
cnt1207	Kings County
cnt1208	Hants County
cnt1209	Halifax County
cnt1210	Colchester County
cnt1211	Cumberland County
cnt1212	Pictou County
cnt1213	Guysborough Cou...
cnt1214	Antigonish County

5. Dataset <Street_Name_Routes>
   - No primary key defined.

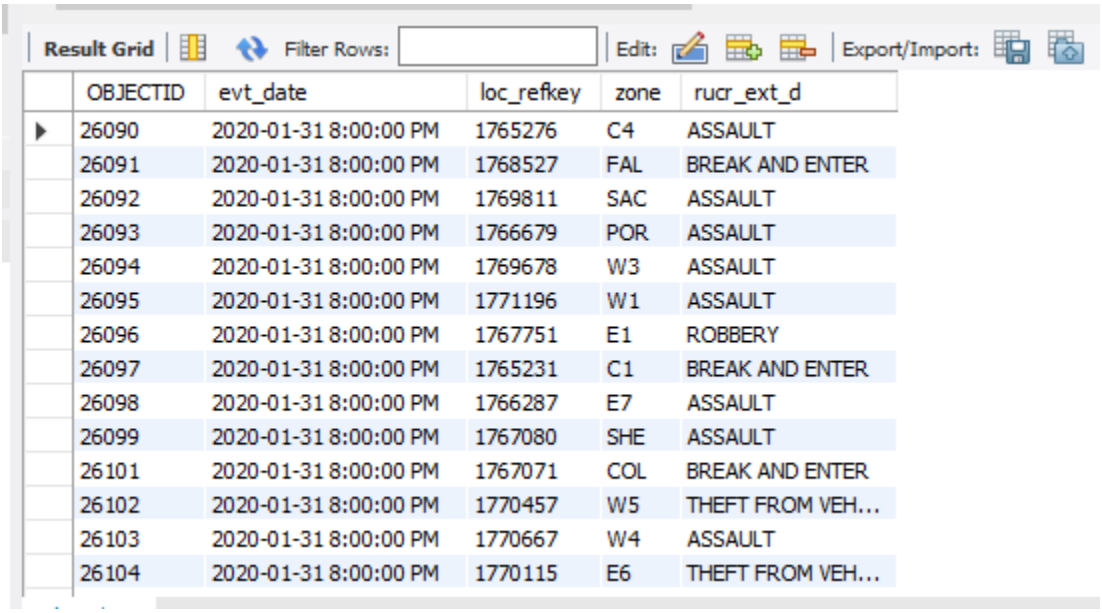


Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

OBJECTID	FULL_NAME	STR_NAME	STR_TYPE	MIX_FULL	STR_CODE
1764874	WATERFRONT DR	WATERFRONT	DR	Waterfront Dr	5188
1764875	BAHA CRT	BAHA	CRT	Baha Crt	10097
1764876	CHIPSHOT CRT	CHIPSHOT	CRT	Chipshot Crt	16797
1764877	PINHIGH CRT	PINHIGH	CRT	Pinhigh Crt	17066
1764878	FRENCH MASTS LANE	FRENCH MASTS	LANE	French Masts Lane	5079
1764879	HARRIS CRT	HARRIS	CRT	Harris Crt	5090
1764880	HEFFLER ST	HEFFLER	ST	Heffler St	5091
1764881	FURRING CRT	FURRING	CRT	Furring Crt	15708
1764882	SLICERS LANE	SLICERS	LANE	Slicers Lane	16569
1764883	ROSSING DR	ROSSING	DR	Rossing Dr	10836
1764884	HARRIS ST	HARRIS	ST	Harris St	380
1764885	HARVARD ST	HARVARD	ST	Harvard St	383
1764886	YARDING CRT	YARDING	CRT	Yarding Crt	15331
1764887	COGSWELL ST	COGSWELL	ST	Cogswell St	192
1764888	JOHN STEWART DR	JOHN STEWART	DR	John Stewart Dr	7863

   - "OBJECTID" is defined as primary key.

6. Dataset <Crime>
   - No primary key defined.

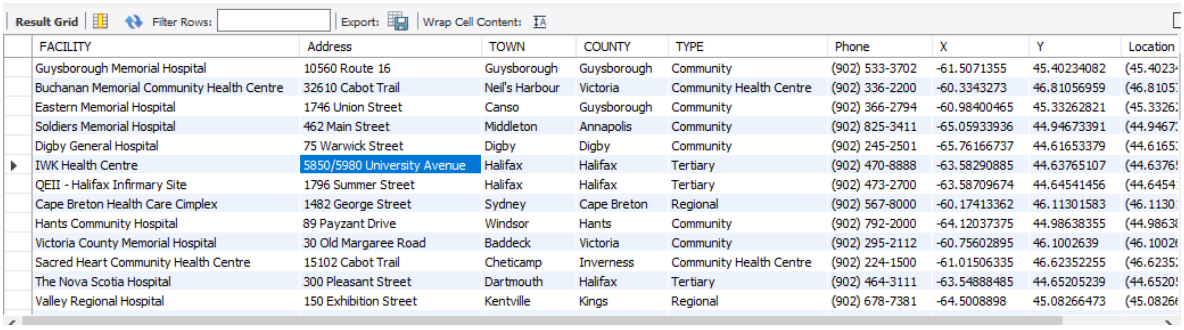


Result Grid | Filter Rows: | Edit: | Export/Import:

OBJECTID	evt_date	loc_refkey	zone	rucr_ext_d
26090	2020-01-31 8:00:00 PM	1765276	C4	ASSAULT
26091	2020-01-31 8:00:00 PM	1768527	FAL	BREAK AND ENTER
26092	2020-01-31 8:00:00 PM	1769811	SAC	ASSAULT
26093	2020-01-31 8:00:00 PM	1766679	POR	ASSAULT
26094	2020-01-31 8:00:00 PM	1769678	W3	ASSAULT
26095	2020-01-31 8:00:00 PM	1771196	W1	ASSAULT
26096	2020-01-31 8:00:00 PM	1767751	E1	ROBBERY
26097	2020-01-31 8:00:00 PM	1765231	C1	BREAK AND ENTER
26098	2020-01-31 8:00:00 PM	1766287	E7	ASSAULT
26099	2020-01-31 8:00:00 PM	1767080	SHE	ASSAULT
26101	2020-01-31 8:00:00 PM	1767071	COL	BREAK AND ENTER
26102	2020-01-31 8:00:00 PM	1770457	W5	THEFT FROM VEH...
26103	2020-01-31 8:00:00 PM	1770667	W4	ASSAULT
26104	2020-01-31 8:00:00 PM	1770115	E6	THEFT FROM VEH...

   - "OBJECTID" defined as primary key.
   - Defined "loc_refkey" is foreign key for <Street_Name_Routes>.

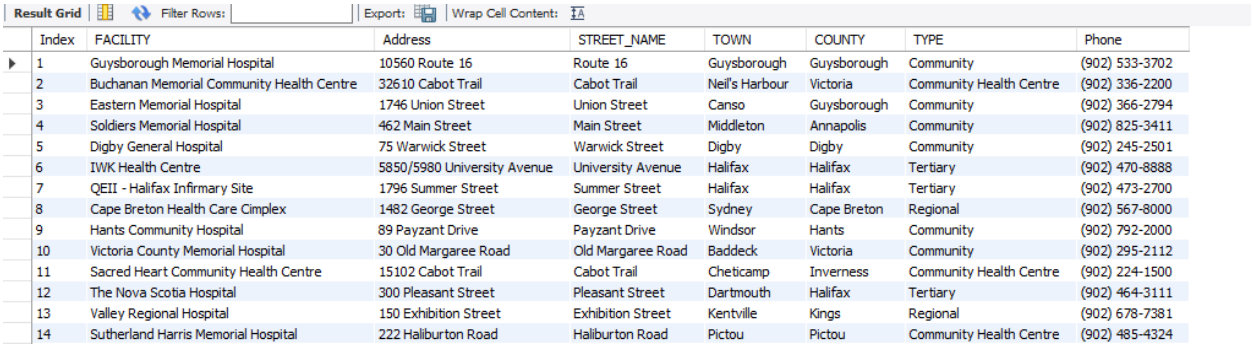
7. Dataset <Hospital>
   - No primary key defined.
   - “Address” is multivalve attribute.



FACILITY	Address	TOWN	COUNTY	TYPE	Phone	X	Y	Location
Guysborough Memorial Hospital	10560 Route 16	Guysborough	Guysborough	Community	(902) 533-3702	-61.5071355	45.40234082	(45.4023
Buchanan Memorial Community Health Centre	32610 Cabot Trail	Neil's Harbour	Victoria	Community Health Centre	(902) 336-2200	-60.3343273	46.81056959	(46.8105
Eastern Memorial Hospital	1746 Union Street	Canso	Guysborough	Community	(902) 366-2794	-60.98400465	45.33262821	(45.3326
Soldiers Memorial Hospital	462 Main Street	Middleton	Annapolis	Community	(902) 825-3411	-65.05933936	44.94673391	(44.9467
Digby General Hospital	75 Warwick Street	Digby	Digby	Community	(902) 245-2501	-65.76166737	44.61653379	(44.6165
IWK Health Centre	5850/5980 University Avenue	Halifax	Halifax	Tertiary	(902) 470-8888	-63.58290885	44.63765107	(44.6376
QEII - Halifax Infirmary Site	1796 Summer Street	Halifax	Halifax	Tertiary	(902) 473-2700	-63.58709674	44.64541456	(44.6454
Cape Breton Health Care Cimplex	1482 George Street	Sydney	Cape Breton	Regional	(902) 567-8000	-60.17413362	46.11301583	(46.1130
Hants Community Hospital	89 Payzant Drive	Windsor	Hants	Community	(902) 792-2000	-64.12037375	44.98638355	(44.9863
Victoria County Memorial Hospital	30 Old Margaree Road	Baddeck	Victoria	Community	(902) 295-2112	-60.75602895	46.1002639	(46.1002
Sacred Heart Community Health Centre	15102 Cabot Trail	Cheticamp	Inverness	Community Health Centre	(902) 224-1500	-61.01506335	46.62352255	(46.6235
The Nova Scotia Hospital	300 Pleasant Street	Dartmouth	Halifax	Tertiary	(902) 464-3111	-63.54888485	44.65205239	(44.6520
Valley Regional Hospital	150 Exhibition Street	Kentville	Kings	Regional	(902) 678-7381	-64.5008898	45.08266473	(45.0826

After normalization:

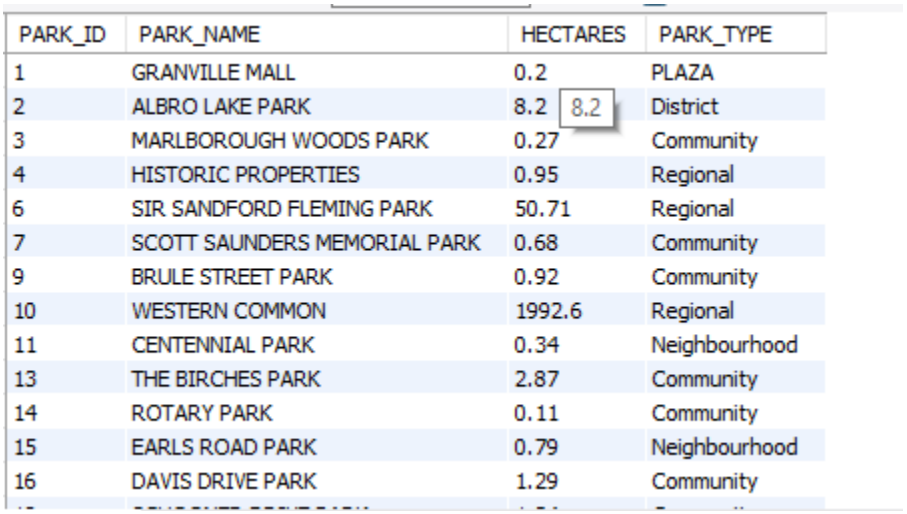
   - Added “STREET_NAME” attribute separated from “Address” attribute.



Index	FACILITY	Address	STREET_NAME	TOWN	COUNTY	TYPE	Phone
1	Guysborough Memorial Hospital	10560 Route 16	Route 16	Guysborough	Guysborough	Community	(902) 533-3702
2	Buchanan Memorial Community Health Centre	32610 Cabot Trail	Cabot Trail	Neil's Harbour	Victoria	Community Health Centre	(902) 336-2200
3	Eastern Memorial Hospital	1746 Union Street	Union Street	Canso	Guysborough	Community	(902) 366-2794
4	Soldiers Memorial Hospital	462 Main Street	Main Street	Middleton	Annapolis	Community	(902) 825-3411
5	Digby General Hospital	75 Warwick Street	Warwick Street	Digby	Digby	Community	(902) 245-2501
6	IWK Health Centre	5850/5980 University Avenue	University Avenue	Halifax	Halifax	Tertiary	(902) 470-8888
7	QEII - Halifax Infirmary Site	1796 Summer Street	Summer Street	Halifax	Halifax	Tertiary	(902) 473-2700
8	Cape Breton Health Care Cimplex	1482 George Street	George Street	Sydney	Cape Breton	Regional	(902) 567-8000
9	Hants Community Hospital	89 Payzant Drive	Payzant Drive	Windsor	Hants	Community	(902) 792-2000
10	Victoria County Memorial Hospital	30 Old Margaree Road	Old Margaree Road	Baddeck	Victoria	Community	(902) 295-2112
11	Sacred Heart Community Health Centre	15102 Cabot Trail	Cabot Trail	Cheticamp	Inverness	Community Health Centre	(902) 224-1500
12	The Nova Scotia Hospital	300 Pleasant Street	Pleasant Street	Dartmouth	Halifax	Tertiary	(902) 464-3111
13	Valley Regional Hospital	150 Exhibition Street	Exhibition Street	Kentville	Kings	Regional	(902) 678-7381
14	Sutherland Harris Memorial Hospital	222 Haliburton Road	Haliburton Road	Pictou	Pictou	Community Health Centre	(902) 485-4324

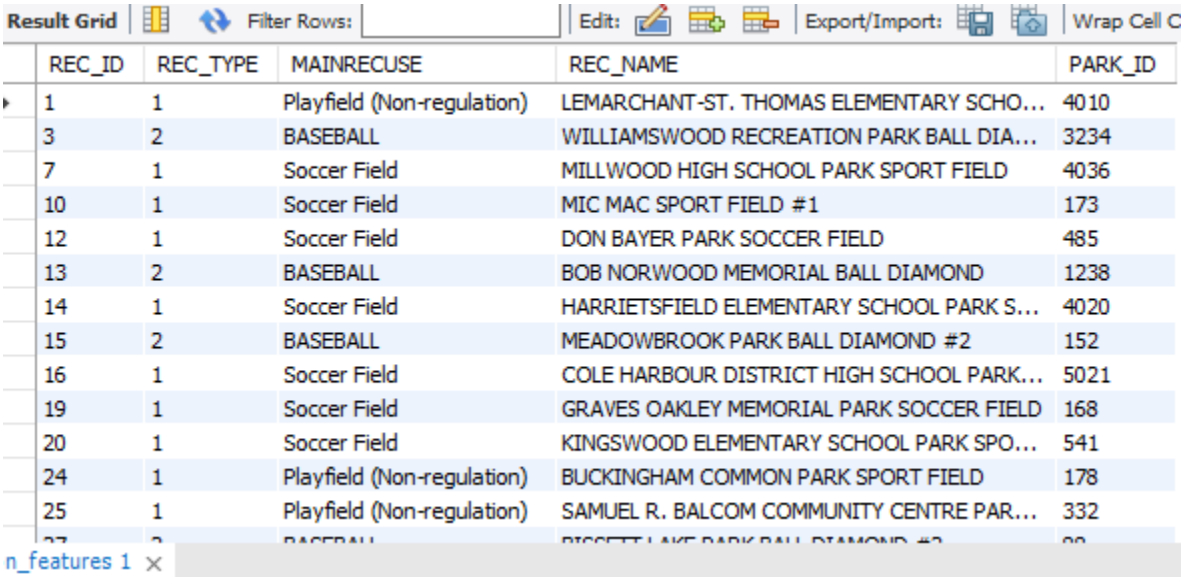
Note: When provided location reference to <street_name_routes>, only 5 rows affected out of 48.

8. Dataset <HRM_Parks>
   - It is already in 3NF.



PARK_ID	PARK_NAME	HECTARES	PARK_TYPE
1	GRANVILLE MALL	0.2	PLAZA
2	ALBRO LAKE PARK	8.2	District
3	MARLBOROUGH WOODS PARK	0.27	Community
4	HISTORIC PROPERTIES	0.95	Regional
6	SIR SANDFORD FLEMING PARK	50.71	Regional
7	SCOTT SAUNDERS MEMORIAL PARK	0.68	Community
9	BRULE STREET PARK	0.92	Community
10	WESTERN COMMON	1992.6	Regional
11	CENTENNIAL PARK	0.34	Neighbourhood
13	THE BIRCHES PARK	2.87	Community
14	ROTARY PARK	0.11	Community
15	EARLS ROAD PARK	0.79	Neighbourhood
16	DAVIS DRIVE PARK	1.29	Community

9. Dataset <HRM_Park_Recreation_Features>
   - No primary key defined.
   - Not in 1NF.



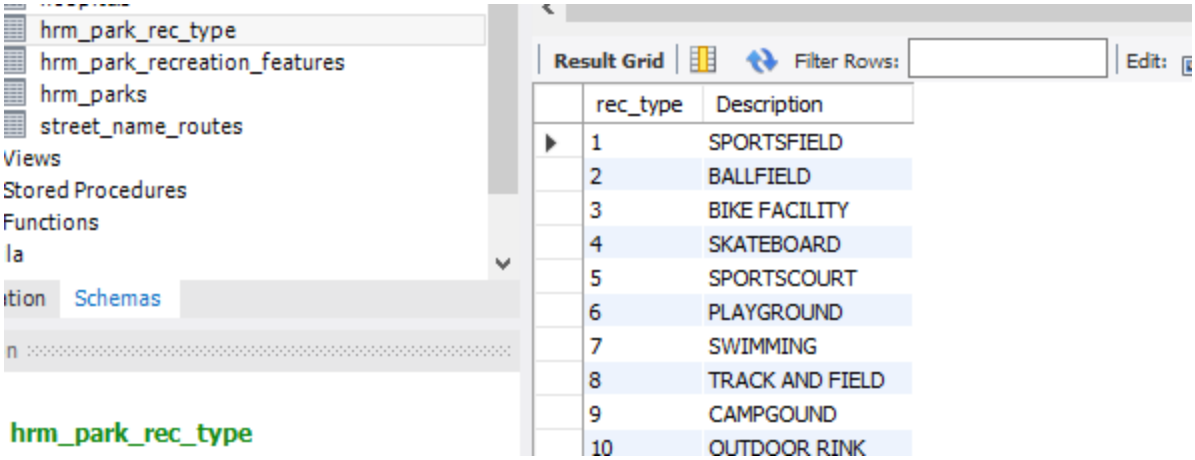
Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell C

REC_ID	REC_TYPE	MAINRECUSE	REC_NAME	PARK_ID
1	1	Playfield (Non-regulation)	LEMARCHANT-ST. THOMAS ELEMENTARY SCHO...	4010
3	2	BASEBALL	WILLIAMSWOOD RECREATION PARK BALL DIA...	3234
7	1	Soccer Field	MILLWOOD HIGH SCHOOL PARK SPORT FIELD	4036
10	1	Soccer Field	MIC MAC SPORT FIELD #1	173
12	1	Soccer Field	DON BAYER PARK SOCCER FIELD	485
13	2	BASEBALL	BOB NORWOOD MEMORIAL BALL DIAMOND	1238
14	1	Soccer Field	HARRIETSFIELD ELEMENTARY SCHOOL PARK S...	4020
15	2	BASEBALL	MEADOWBROOK PARK BALL DIAMOND #2	152
16	1	Soccer Field	COLE HARBOUR DISTRICT HIGH SCHOOL PARK...	5021
19	1	Soccer Field	GRAVES OAKLEY MEMORIAL PARK SOCCER FIELD	168
20	1	Soccer Field	KINGSWOOD ELEMENTARY SCHOOL PARK SPO...	541
24	1	Playfield (Non-regulation)	BUCKINGHAM COMMON PARK SPORT FIELD	178
25	1	Playfield (Non-regulation)	SAMUEL R. BALCOM COMMUNITY CENTRE PAR...	332

n_features 1 ×

After Normalization:

- Defined “REC_ID” as primary key.
- Separated “rec_type” and its description to different entity-set to convert it to 3NF.



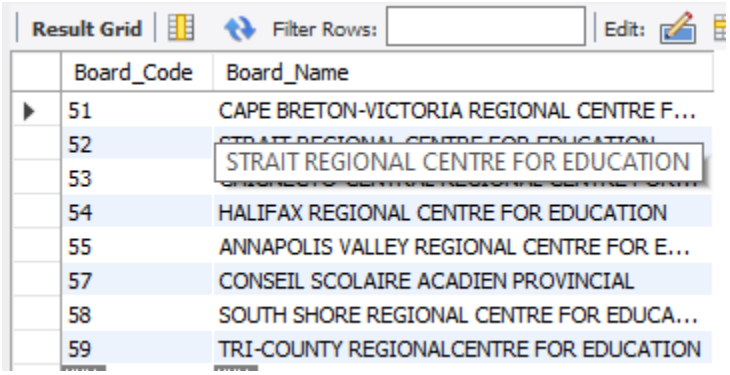
rec_type	Description
1	SPORTSFIELD
2	BALLFIELD
3	BIKE FACILITY
4	SKATEBOARD
5	SPORTSCOURT
6	PLAYGROUND
7	SWIMMING
8	TRACK AND FIELD
9	CAMPGOUND
10	OUTDOOR RINK

10. Dataset <Nova_Scotia_Public_School_Contact_Information>
    - No primary key defined.
    - Year is not in “Year ()” format.]
    - Not in 1NF.

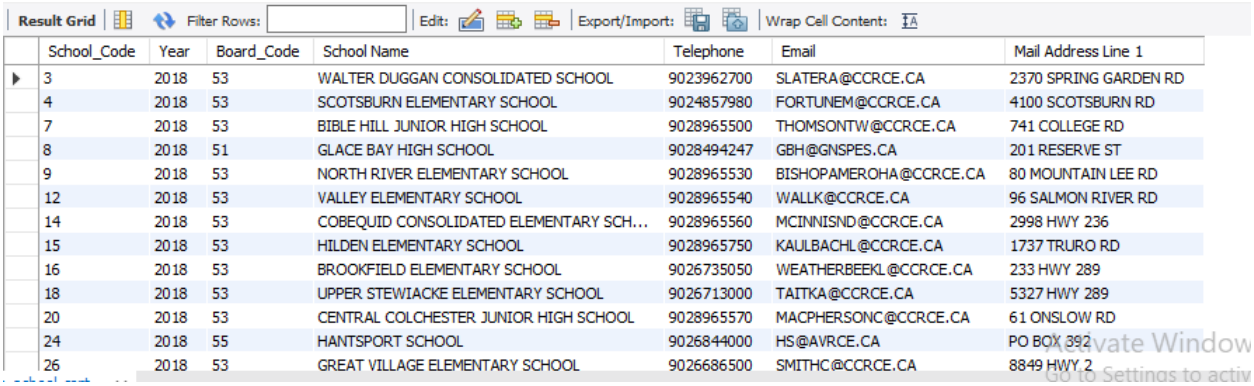
Year	Board Code	Board Name	School Code	School Name	Mail Addr	Mail Addr	Mailing Post	Civic Addr	Civic Addr	Civic Post	Telephon
2018-2019	51	CAPE BRETON-VICTC	96	BADDECK ACADEMY	PO BOX 31	BADDECK	B0E 1B0	320 SHORI	BADDECK	B0E 1B0	9.02E+09
2018-2019	51	CAPE BRETON-VICTC	93	BOULARDERIE ELEMENTARY SCHOO	12065 KEN	BOULARDI	B1X 1J9				9.03E+09
2018-2019	51	CAPE BRETON-VICTC	101	BRAS D'OR ELEMENTARY SCHOOL	10 ALDER	BRAS D'OI	B1Y 2K1				9.03E+09
2018-2019	51	CAPE BRETON-VICTC	640	BRETON EDUCATION CENTRE	667 EIGHT	NEW WAT	B1H 3T4				9.03E+09
2018-2019	51	CAPE BRETON-VICTC	995	BROOKLAND ELEMENTARY SCHOOL	153 COTTA	SYDNEY N	B1P 2E5				9.03E+09
2018-2019	51	CAPE BRETON-VICTC	107	CABOT EDUCATION CENTRE	32039 CAE	NEIL'S HA	B0C 1N0				9.02E+09
2018-2019	51	CAPE BRETON-VICTC	962	CAPE SMOKEY ELEMENTARY SCHOO	PO BOX 26	INGONISH	B0C 1K0	39 BRAND	INGONISH	B0C 1K0	9.02E+09
2018-2019	51	CAPE BRETON-VICTC	1169	CBVRCE ADULT HIGH SCHOOL	290 WHITI	SYDNEY N	B1P 5A6				9.03E+09
2018-2019	51	CAPE BRETON-VICTC	186	COXHEATH ELEMENTARY SCHOOL	30 MT. FLO	COXHEATI	B1R 1T8				9.03E+09
2018-2019	51	CAPE BRETON-VICTC	1101	CUSACK SCHOOL	500 BIRCH	SYDNEY N	B1P 3V9				9.03E+09
2018-2019	51	CAPE BRETON-VICTC	996	DONKIN SCHOOL	81 CENTRE	DONKIN N	B0A 1G0				9.03E+09
2018-2019	51	CAPE BRETON-VICTC	98	DR. T.L. SULLIVAN MIDDLE SCHOOL	256 PARK	FLORENCE	B1Y 1N2				9.03E+09
2018-2019	51	CAPE BRETON-VICTC	1153	FERRISVIEW ELEMENTARY SCHOOL	83 ARCHIE	NORTH SY	B2A 2W9				9.03E+09
2018-2019	51	CAPE BRETON-VICTC	416	GLACE BAY ELEMENTARY SCHOOL	135 BROO	GLACE BA	B1A 1K8				9.03E+09

After Normalization:

- New entity-set <Board_info> create to separate “board_code” and “board_name”.



- Entity-set <Nova_Scotia_Public_School_Contact_Information> refers entity-set<Board_info>.



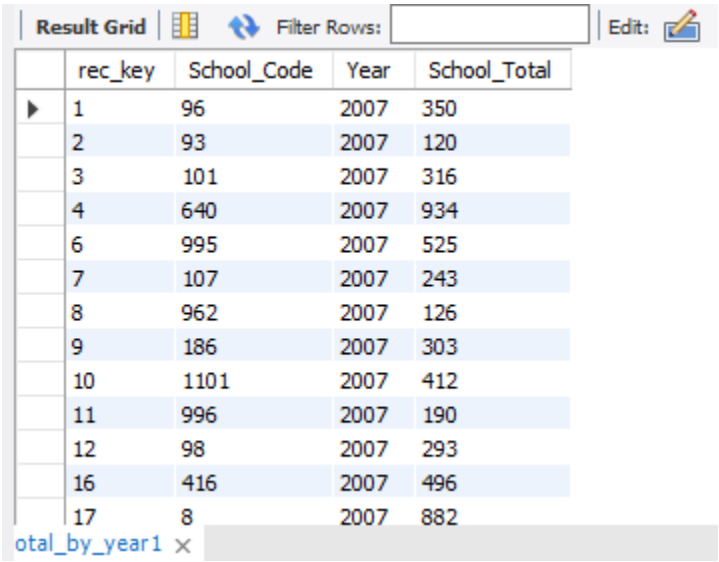
- Defined “Schoold_Code” as primary key.

11. Dataset <Nova_Scotia_Public_School_Enrolment_by_Board_and_School>
    - Not in 1NF.
    - “Year” is not in Year () format.

Year	Board Code	Board Name	School Code	School Name	School Total
2006-2007	51	CAPE BRETON-VICTOR	96	BADDECK ACADEMY	350
2006-2007	51	CAPE BRETON-VICTOR	93	BOULARDERIE ELEMENTARY SCHOOL	120
2006-2007	51	CAPE BRETON-VICTOR	101	BRAS D'OR ELEMENTARY SCHOOL	316
2006-2007	51	CAPE BRETON-VICTOR	640	BRETON EDUCATION CENTRE	934
2006-2007	51	CAPE BRETON-VICTOR	551	BRIDGEPORT SCHOOL	132
2006-2007	51	CAPE BRETON-VICTOR	995	BROOKLAND ELEMENTARY SCHOOL	525
2006-2007	51	CAPE BRETON-VICTOR	107	CABOT EDUCATION CENTRE	243
2006-2007	51	CAPE BRETON-VICTOR	962	CAPE SMOKEY ELEMENTARY SCHOOL	126
2006-2007	51	CAPE BRETON-VICTOR	186	COXHEATH ELEMENTARY SCHOOL	303
2006-2007	51	CAPE BRETON-VICTOR	1101	CUSACK SCHOOL	412
2006-2007	51	CAPE BRETON-VICTOR	996	DONKIN SCHOOL	190
2006-2007	51	CAPE BRETON-VICTOR	98	DR. T. L. SULLIVAN MIDDLE SCHOOL	293
2006-2007	51	CAPE BRETON-VICTOR	99	FLORENCE ELEMENTARY SCHOOL	151
2006-2007	51	CAPE BRETON-VICTOR	626	GEORGE D. LEWIS SCHOOL	137
2006-2007	51	CAPE BRETON-VICTOR	442	GLACE BAY ADULT EDUCATION CENTRE	47
2006-2007	51	CAPE BRETON-VICTOR	416	GLACE BAY ELEMENTARY SCHOOL	496
2006-2007	51	CAPE BRETON-VICTOR	8	GLACE BAY HIGH SCHOOL	882
2006-2007	51	CAPE BRETON-VICTOR	964	HARBOURSIDE ELEMENTARY SCHOOL	476

After normalization:

- Inserted new primary key “rec_key”
- Removed redundant attributes from table.



- Created a reference to entity-set <Nova_Scotia_Public_School_Contact_Information> for “School_code”.

References:

[1] https://dal.ca.libguides.com/data/novascotia
[2] https://data.novascotia.ca/
[3] http://catalogue-hrm.opendata.arcgis.com/
[4] https://www.draw.io/