Professional Assessment

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SNHU has sincerely been a journey of self-reflection, perseverance, dedication, and incessant possibilities. From the beginning, the Computer Science program set the foundation at a high standard with the superiority of professors to the allotted coursework given throughout the program. As my brain was exercised and challenged with each assignment, I acquired the vital skills and abilities necessary to make an impression and showcase my capabilities. During the development of the ePortfolio, I even now found myself being confronted with complex obstacles while at the same time creating new competencies that will continue to help shape the basis of my forthcoming career in the field.

The curriculum used for the program is comparable to that of any other competing institution elsewhere. Not only has the capstone class provided me with a space to be a creative and think outside of the box, divergent courses at SNHU have done the same. In IT 340 Network and Telecommunications, I created a secure network with built in firewall safety using MPLS routers with individual IP addresses connected to a LAN. A back up router was used as a standby device to assume IP address assignments in case any primary devices crashed on the system. This showed strategies for WAN connectivity, wireless access, and overall technical rationale.

Collaborating in a team environment was beneficial to helping understand the use of version control tools and the developmental integrity it takes to control the complete workflow. Communication, as I have learned throughout the program is a key formality of success. While taking the Software Development Lifecycle course, it was very important to keep all levels of management and key stakeholders up to date on the progression of a project. Agile methodologies played a major role in this because of the consistent succession of releases and testing. Here, I learned that customer interaction is of the most importance. Time is money and

with that you must be able to take constructive criticism and abide by customer feedback in order to get the best version of the project.

Data Structures are the programmatic way of storing data so that data can be used efficiently, and algorithms define a set of instructions to be executed in a certain order to get the desired output (Tutorials Point, n.d.). Using C++ to create structures and algorithms I gained knowledge on linked list, stacks and queues, arrays, searching techniques such as hash tables as well as linear and binary, recursion, and tree structures. These skills have helped me build the foundation to understand basic concepts to work with business level applications.

In Software Engineering you develop various applications that aid in complete user functionality to perform basic to advanced tasks. Skills that I have obtained throughout the duration of the program are as follows: debugging, creating a program in various languages, software testing, documentation and requirements, designing, problem solving, the software development process, and information analysis. These abilities have helped me to successfully build coding projects that are functional while following coding best practices for readability, maintainability, and consistency.

Databases are crucial to any operational business being they hold all information needed to sustain, organize, and collect customer information. Database management allows one to access information, read, write, update and manage data. Within the program I have learned MySQL pertaining to relational databases, NoSQL utilizing MongoDB for larger unstructured sets of data, and Data Mining. All three correlate to discovering trends, patterns, data usage, and business insight. As a final project I created a database management report that required queries of specific databases and tables to extract data providing greater awareness while highlighting data to display summaries for all customers.

All in all, I believe the Computer Science program has prepared me for a very successful yet rewarding career in the field. It has been with tremendous gratitude that I am humbled by the full experience received at SNHU. I am appreciative and hope to take what I have learned to embark on a self-fulfilling journey of continuous technological growth and advancement.

Artifacts

The artifacts I have below showcase what I have learned throughout the Computer Science program based upon three categories: software engineering and design, algorithms and data structures, and databases. Both artifacts correspond with one another by using data to fulfill desired output. To satisfy requirements for enhancements one and two I chose the zoo monitoring system. The complete updated artifact has been converted from Java to C++, simplified in form, performs with no bug issues, and displays a basic data structure with loops in the form of while statements to fulfill the algorithm. The enhancement three artifacts satisfy the database portion of the assignment. Here I created two databases titled bubba and corporate with 5 tables: person, dine_out, salary, location, and department. Using MySQL and the MySQL 8.0 command line client, I used various SQL statements to perform basic queries of data to manipulate, manage, and analyze data.

Zoo Monitoring System

Java converted into C++. Zoo monitoring system simplified in design with basic data structures and algorithms.

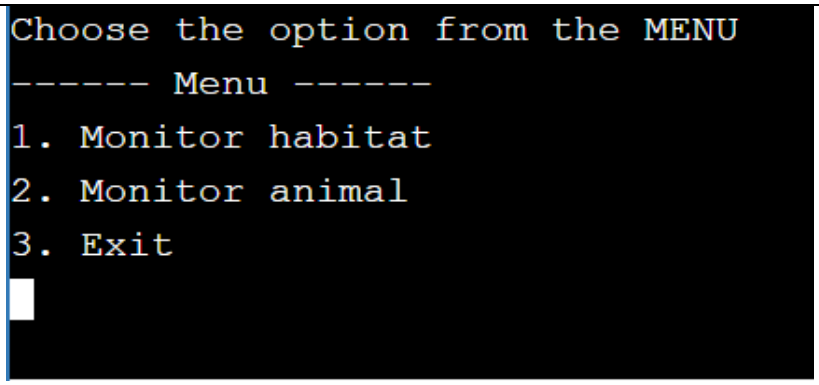
Artifact for Enhancement 1 and 2

Zoo Monitoring System

```
#include <iostream>
#include <string>
#include <fstream>

using namespace std;
void monitorHabitat()
{
	 string habitat;
	fstream file;
	file.open("habitats.txt");

	while (!file.eof())
	{
		file >> habitat;
		cout << habitat << endl;
	}
	file.close();
}
void monitorAnimal()
{
	string animal;
	fstream file;
	file.open("animals.txt");

	while (!file.eof())
{
		file >> animal;
		cout << animal << endl;
}
	file.close();
}
int main()
{
```

```
        int x;
        cout << "Choose the option from the MENU" << endl;
        cout << "------ Menu ------" << endl;
        cout << "1. Monitor habitat" << endl;
        cout << "2. Monitor animal " << endl;
        cout << "3. Exit" << endl;
        cin >> x;
}
```

End Code



Habitats

Details on penguin habitat
Details on bird house
Details on aquarium

Habitat - Penguin
Temperature: Freezing
*****Food source: Fish in water running low
Cleanliness: Passed

Habitat - Bird
Temperature: Moderate
Food source: Natural from environment
Cleanliness: Passed

Habitat - Aquarium
Temperature: Varies with output temperature
Food source: Added daily
*****Cleanliness: Needs cleaning from algae

Animals

Details on lions

Details on tigers
Details on bears
Details on giraffes

Animal - Lion
Name: Leo
Age: 5
*****Health concerns: Cut on left front paw
Feeding schedule: Twice daily

Animal - Tiger
Name: Maj
Age: 15
Health concerns: None
Feeding schedule: 3x daily

Animal - Bear
Name: Baloo
Age: 1
Health concerns: None
*****Feeding schedule: None on record

Animal - Giraffe
Name: Spots
Age: 12
Health concerns: None
Feeding schedule: Grazing

Database management

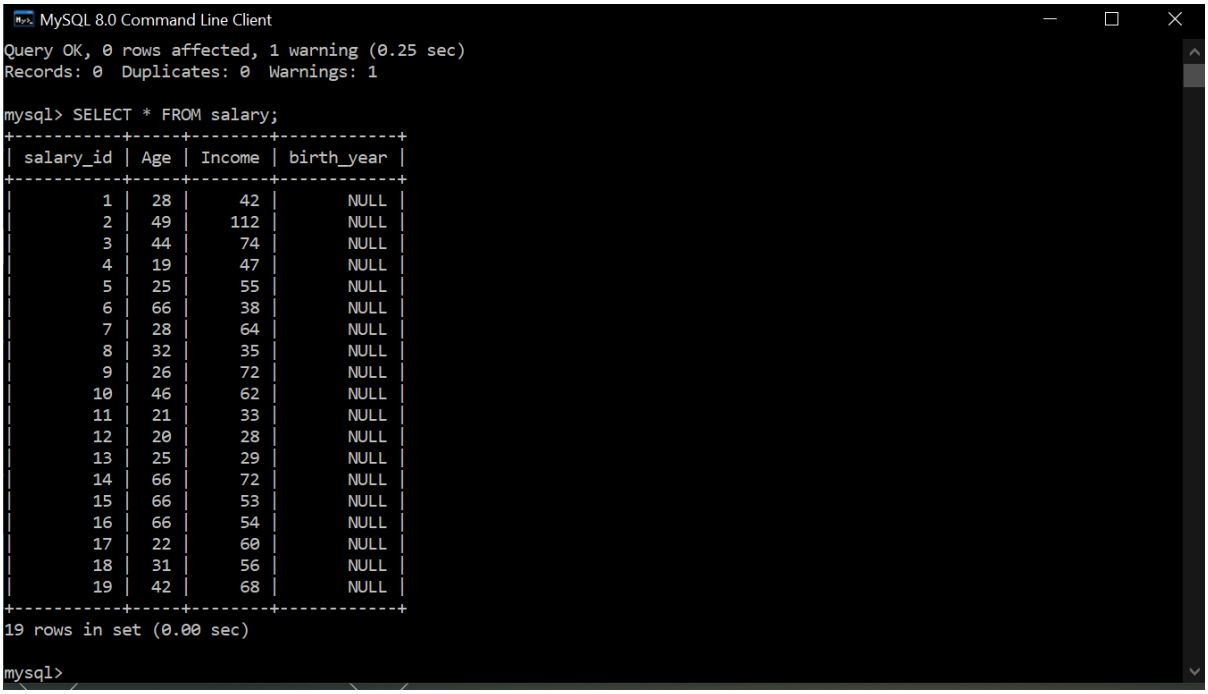
Relational database created to showcase skills that have been obtained throughout the duration of the program using the structured query language MySQL.

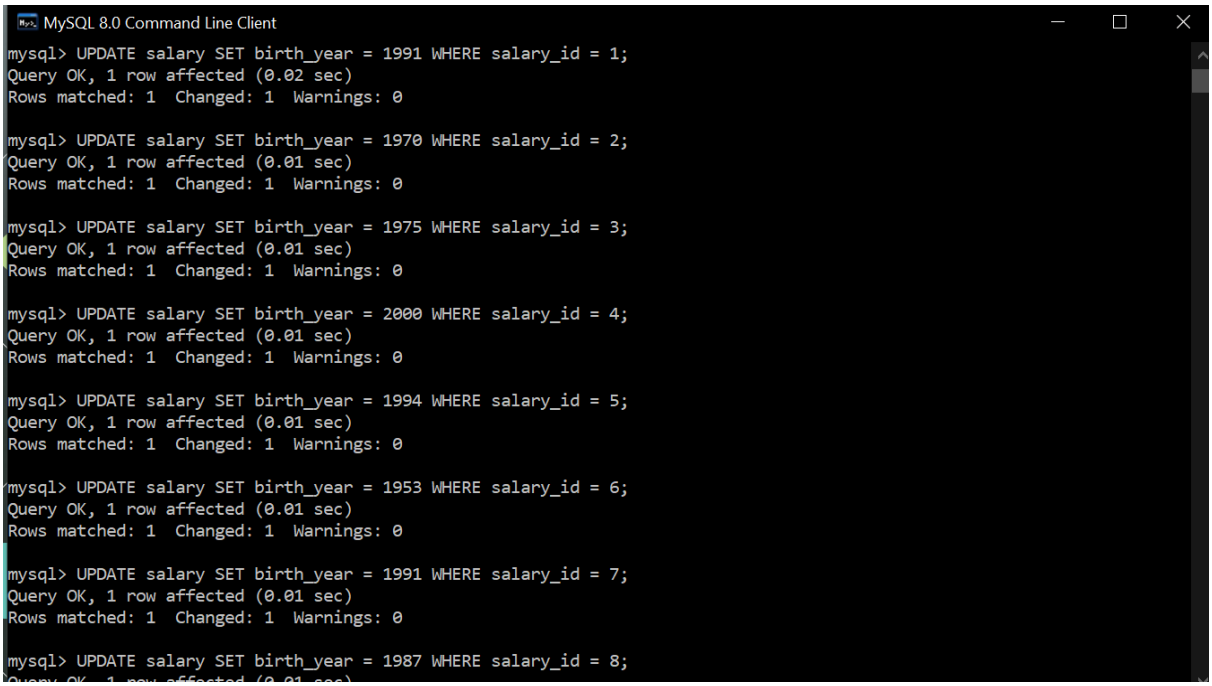
Artifact for Enhancement 3

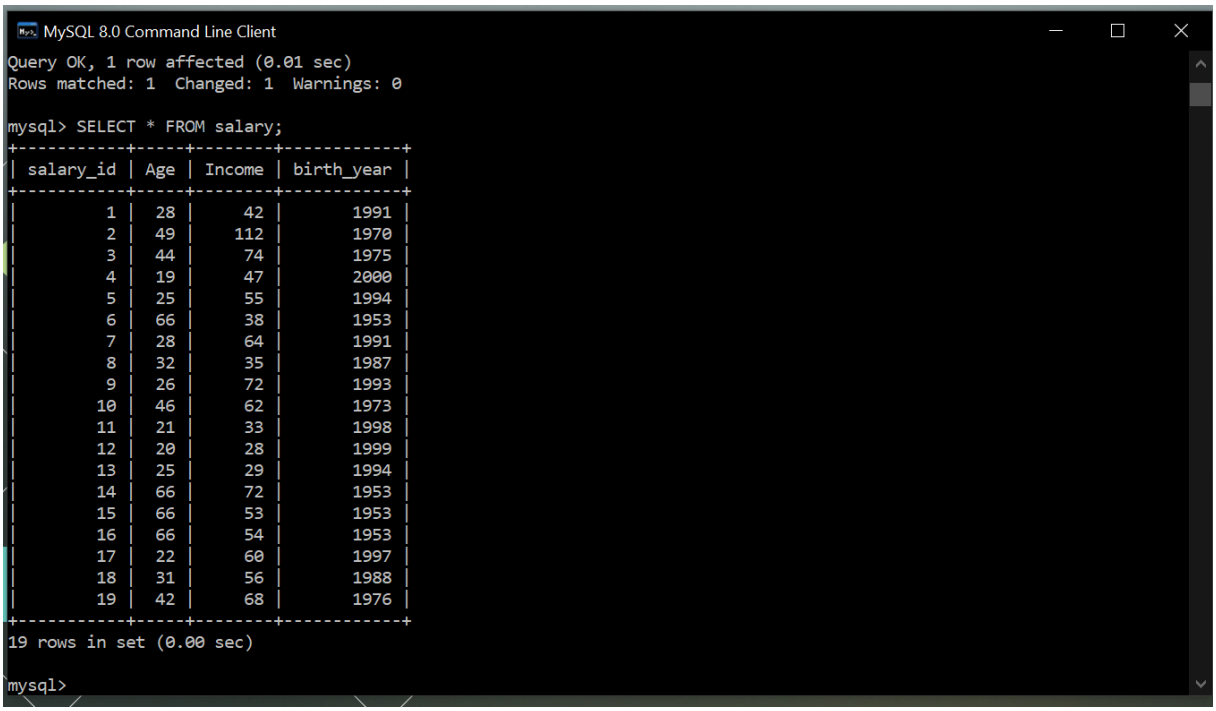
Bubba Gump Shrimp Database Report

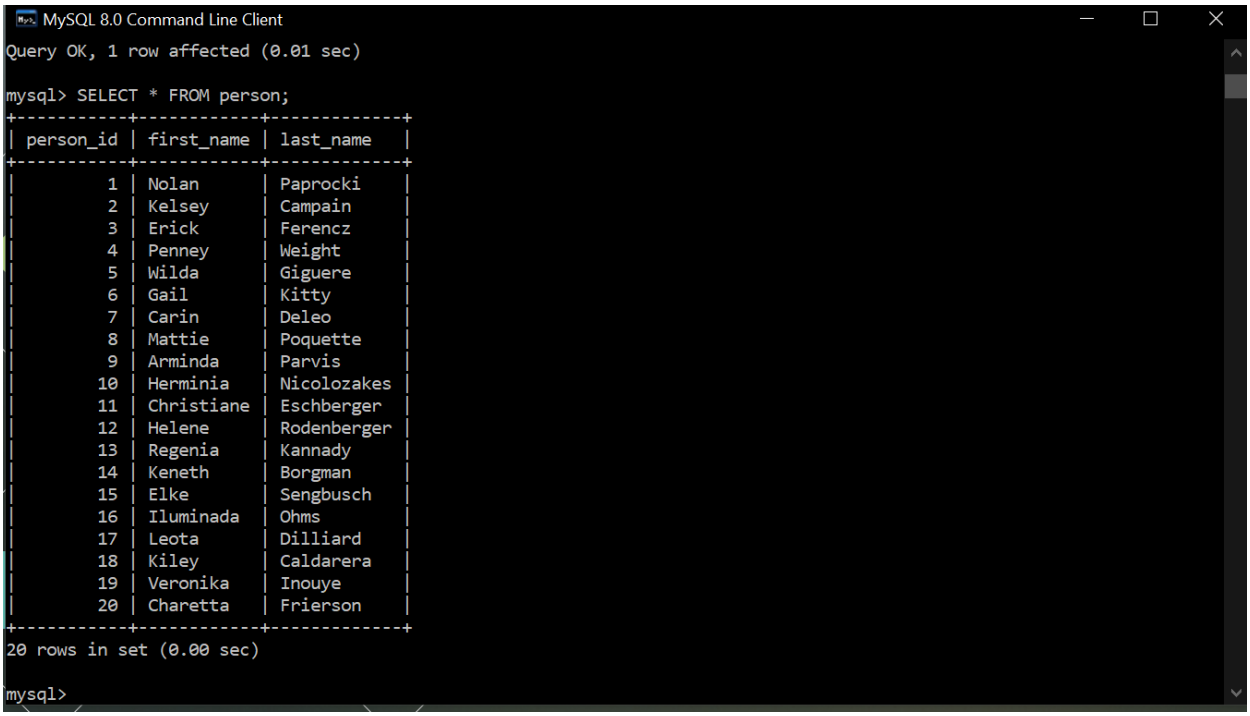
```
mysql> USE bubba
No connection. Trying to reconnect...
Connection id:    42
Current database: *** NONE ***

Database changed
mysql> SHOW TABLES;
+----------------+
| Tables_in_bubba |
+----------------+
| dine_out       |
| location       |
| person         |
| salary         |
+----------------+
4 rows in set (0.07 sec)

mysql>
```

```
mysql> ALTER TABLE salary
    -> ADD birth_year INT(4) NULL;
Query OK, 0 rows affected, 1 warning (0.25 sec)
Records: 0  Duplicates: 0  Warnings: 1

mysql>
```


MySQL 8.0 Command Line Client
Query OK, 0 rows affected, 1 warning (0.25 sec)
Records: 0 Duplicates: 0 Warnings: 1
mysql> SELECT * FROM salary;
salary_id	Age	Income	birth_year
1	28	42	NULL
2	49	112	NULL
3	44	74	NULL
4	19	47	NULL
5	25	55	NULL
6	66	38	NULL
7	28	64	NULL
8	32	35	NULL
9	26	72	NULL
10	46	62	NULL
11	21	33	NULL
12	20	28	NULL
13	25	29	NULL
14	66	72	NULL
15	66	53	NULL
16	66	54	NULL
17	22	60	NULL
18	31	56	NULL
19	42	68	NULL
19 rows in set (0.00 sec)
mysql>


MySQL 8.0 Command Line Client
mysql> UPDATE salary SET birth_year = 1991 WHERE salary_id = 1;
Query OK, 1 row affected (0.02 sec)
Rows matched: 1 Changed: 1 Warnings: 0
mysql> UPDATE salary SET birth_year = 1970 WHERE salary_id = 2;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1 Changed: 1 Warnings: 0
mysql> UPDATE salary SET birth_year = 1975 WHERE salary_id = 3;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1 Changed: 1 Warnings: 0
mysql> UPDATE salary SET birth_year = 2000 WHERE salary_id = 4;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1 Changed: 1 Warnings: 0
mysql> UPDATE salary SET birth_year = 1994 WHERE salary_id = 5;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1 Changed: 1 Warnings: 0
mysql> UPDATE salary SET birth_year = 1953 WHERE salary_id = 6;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1 Changed: 1 Warnings: 0
mysql> UPDATE salary SET birth_year = 1991 WHERE salary_id = 7;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1 Changed: 1 Warnings: 0
mysql> UPDATE salary SET birth_year = 1987 WHERE salary_id = 8;


MySQL 8.0 Command Line Client
Query OK, 1 row affected (0.01 sec)
Rows matched: 1 Changed: 1 Warnings: 0
mysql> SELECT * FROM salary;
salary_id	Age	Income	birth_year
1	28	42	1991
2	49	112	1970
3	44	74	1975
4	19	47	2000
5	25	55	1994
6	66	38	1953
7	28	64	1991
8	32	35	1987
9	26	72	1993
10	46	62	1973
11	21	33	1998
12	20	28	1999
13	25	29	1994
14	66	72	1953
15	66	53	1953
16	66	54	1953
17	22	60	1997
18	31	56	1988
19	42	68	1976
19 rows in set (0.00 sec)
mysql>


MySQL 8.0 Command Line Client
Query OK, 1 row affected (0.01 sec)
mysql> SELECT * FROM person;
person_id	first_name	last_name
1	Nolan	Paprocki
2	Kelsey	Campain
3	Erick	Ferencz
4	Penney	Weight
5	Wilda	Giguere
6	Gail	Kitty
7	Carin	Deleo
8	Mattie	Poquette
9	Arminda	Parvis
10	Herminia	Nicolozakes
11	Christiane	Eschberger
12	Helene	Rodenberger
13	Regenia	Kannady
14	Keneth	Borgman
15	Elke	Sengbusch
16	Iluminada	Ohms
17	Leota	Dilliard
18	Kiley	Caldarera
19	Veronika	Inouye
20	Charetta	Frierson
20 rows in set (0.00 sec)
mysql>

MySQL 8.0 Command Line Client

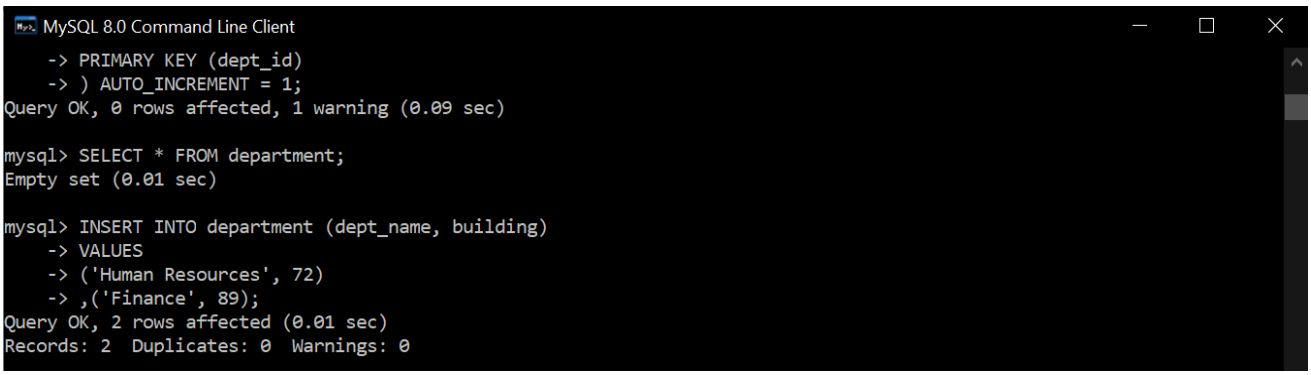
```
    -> WHERE first_name = 'Carin' AND last_name = 'Deleo';
Query OK, 1 row affected (0.01 sec)

mysql> SELECT * FROM person;
+-----------+------------+-------------+
| person_id | first_name | last_name   |
+-----------+------------+-------------+
|         1 | Nolan      | Paprocki    |
|         2 | Kelsey     | Campain     |
|         3 | Erick      | Ferencz     |
|         4 | Penney     | Weight      |
|         5 | Wilda      | Giguere     |
|         6 | Gail       | Kitty       |
|         8 | Mattie     | Poquette    |
|         9 | Arminda    | Parvis      |
|        10 | Herminia   | Nicolozakes |
|        11 | Christiane | Eschberger  |
|        12 | Helene     | Rodenberger |
|        13 | Regenia    | Kannady     |
|        14 | Keneth     | Borgman     |
|        15 | Elke       | Sengbusch   |
|        16 | Iluminada  | Ohms        |
|        17 | Leota      | Dilliard    |
|        18 | Kiley      | Caldarera   |
|        19 | Veronika   | Inouye      |
|        20 | Charetta   | Frierson    |
+-----------+------------+-------------+
19 rows in set (0.00 sec)

mysql>
```

```
mysql> DESC dine_out;
```

MySQL 8.0 Command Line Client

```
+-------------------+------------+------+-----+---------+----------------+
| dine_out_id       | int(11)    | NO   | PRI | NULL    | auto_increment |
| grub_hub          | tinyint(1) | NO   |     | NULL    |                |
| uber_eats         | tinyint(1) | YES  |     | NULL    |                |
| restaurant_number | int(11)    | NO   | MUL | NULL    |                |
+-------------------+------------+------+-----+---------+----------------+
4 rows in set (0.02 sec)

mysql> DESc location;
+-------------+-------------+------+-----+---------+----------------+
| Field       | Type        | Null | Key | Default | Extra          |
+-------------+-------------+------+-----+---------+----------------+
| location_id | int(11)     | NO   | PRI | NULL    | auto_increment |
| city        | varchar(12) | YES  |     | NULL    |                |
| state       | varchar(5)  | YES  |     | NULL    |                |
| zip         | int(11)     | NO   | MUL | NULL    |                |
+-------------+-------------+------+-----+---------+----------------+
4 rows in set (0.00 sec)

mysql> DESC person;
+------------+-------------+------+-----+---------+----------------+
| Field      | Type        | Null | Key | Default | Extra          |
+------------+-------------+------+-----+---------+----------------+
| person_id  | int(11)     | NO   | PRI | NULL    | auto_increment |
| first_name | varchar(12) | YES  |     | NULL    |                |
| last_name  | varchar(12) | YES  |     | NULL    |                |
+------------+-------------+------+-----+---------+----------------+
3 rows in set (0.01 sec)

mysql> DESC salary;
+------------+---------+------+-----+---------+----------------+
| Field      | Type    | Null | Key | Default | Extra          |
+------------+---------+------+-----+---------+----------------+
| salary_id  | int(11) | NO   | PRI | NULL    | auto_increment |
| Age        | int(11) | NO   |     | NULL    |                |
| Income     | int(11) | NO   | MUL | NULL    |                |
| birth_year | int(4)  | YES  |     | NULL    |                |
+------------+---------+------+-----+---------+----------------+
4 rows in set (0.00 sec)
```


MySQL 8.0 Command Line Client
4 rows in set (0.00 sec)
mysql> CREATE DATABASE IF NOT EXISTS corporate;
Query OK, 1 row affected (0.01 sec)
mysql> USE corporate;
Database changed
mysql> CREATE TABLE department (
-> dept_id INT(9) UNSIGNED NOT NULL auto_increment,
-> dept_name VARCHAR(25) default NULL,
-> building VARCHAR(25) default NULL,


MySQL 8.0 Command Line Client
-> PRIMARY KEY (dept_id)
->) AUTO_INCREMENT = 1;
Query OK, 0 rows affected, 1 warning (0.09 sec)
mysql> SELECT * FROM department;
Empty set (0.01 sec)
mysql> INSERT INTO department (dept_name, building)
-> VALUES
-> ('Human Resources', 72)
-> ,('Finance', 89);
Query OK, 2 rows affected (0.01 sec)
Records: 2 Duplicates: 0 Warnings: 0


MySQL 8.0 Command Line Client
mysql> USE corporate
Database changed
mysql> SELECT * FROM department;
+---------+-----------------+----------+
| dept_id | dept_name | building |
+---------+-----------------+----------+
| 1 | Human Resources | 72 |
| 2 | Finance | 89 |
+---------+-----------------+----------+
2 rows in set (0.00 sec)
mysql>

Additional

Network configuration created for Newton Ad Agency

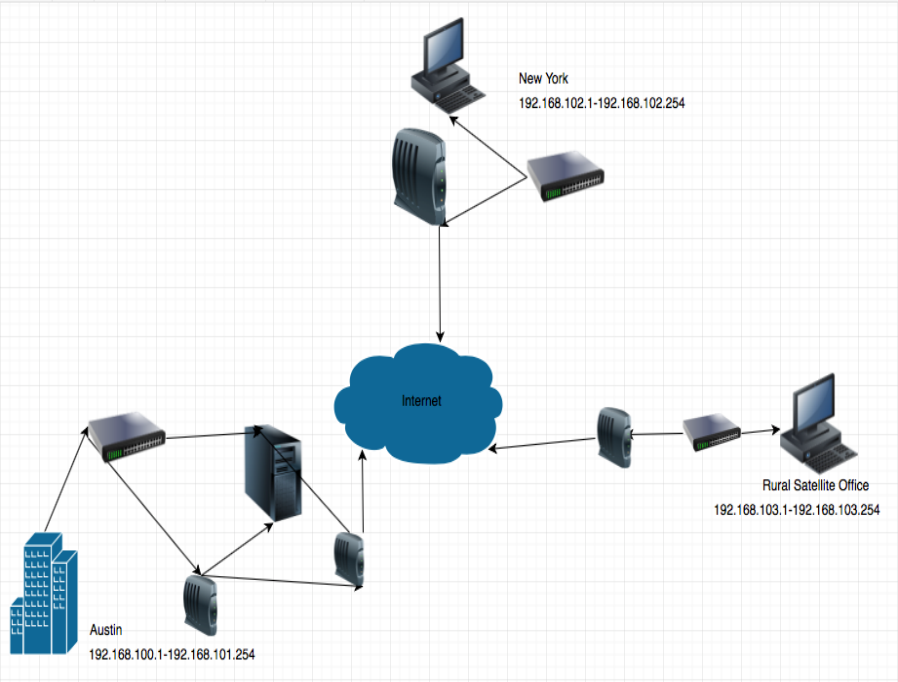


Figure 1. Diagram of WAN technology for Newton Ad Agency Branches.

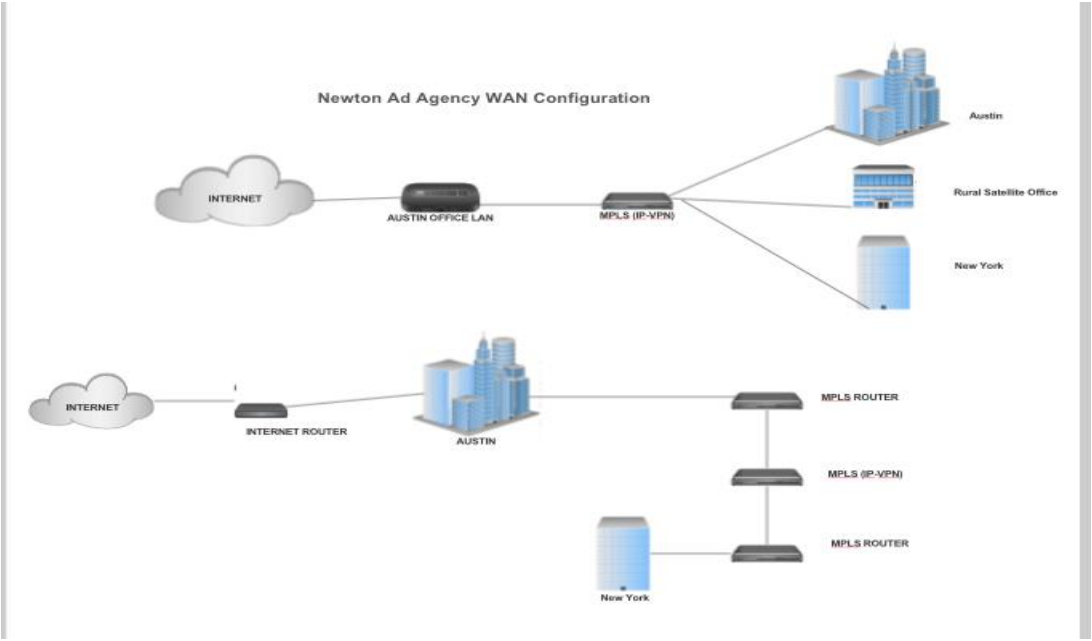


Figure 2. Diagram of WAN configuration.

Subnet	Size	Number of Hosts	Subnet Mask	Assigned IPs
Austin	500	510	255.255.254.0/23	192.168.100.1 - 192.168.101.254
New York	200	254	255.255.255.0/24	192.168.102.1 - 192.168.102.254
Rural Satellite Office	200	254	255.255.255.0/24	192.168.103.1 - 192.168.103.254

References

Tutorials Point. (n.d.). Data Structure and Algorithms Tutorial. Retrieved from https://www.tutorialspoint.com/data_structures_algorithms/index.htm