University of Oklahoma

Mozart

Hillary Neaves, Khady Ndoye, Lam Nguyen, Sahrin Moytree, Sara Mullins

MIS 3353 - Database Management

SQL server: ESa195725

Frederic Daugherty

2020

Executive Summary

Mozart is a database design and development firm that offers a wide range of IT services to its clients to provide effective data management and storage. For more than 16 years, Mozart has been delivering top-notch curations of tailor-made databases and consultation for unique businesses all over the global community. We provide databases that carefully shelf a company's data in a secure and reliable environment. The database can be optionally integrated with other data sources to avoid manual input, which allows companies to use data in a fast and convenient way. We strive to deliver exceptional service and maintain a strong connection with our customers. Mozart has evolved into a full database development firm which creates a wide range of digital products for its clientele. We are famous for our proactive approach, our expert technical professionals prioritize client satisfaction, success, and happiness above all.
Elysian Fly Company, a growing retailer of fly-fishing merchandise, is searching for a database that allows them to increase profitability and enable further growth. The company is seeking to better track and maintain records of inventory, customers, employees, and equipment. Mozart seeks an opportunity from Elysian Fly Company to curate a custom database software for each entity needed. The firm promises to deliver a clean and secure data storage and seamlessly integrate the company's existing database with state-of- the-art sources. Through the three stages of a database building process conceptual, logical, and physical design, the firm will choose only an efficient design to ensure the most beneficial outcome.

The conceptual design phase consists of a carefully curated Entity Relationship Diagram built specifically for Elysian Fly Company, which portrays two important factors of the database: major entities within the project, and the inter-relationships among these entities. By visualizing these relationships, the designers of the database can easily make the connections between each category of information needed. The logical design step is implemented because the entities are converted into relational tables, which will manage to store data regarding a company's entities in a non-redundant manner. The stage will also be placing foreign keys so that all relationships among the entities will be supported. The final step of database design, implementation, includes a series of steps leading to operational information system that involves creating database definitions, testing the system, developing operational procedure and documentation, and populating data. The cost of the project varies by the extra services needed by Team Mozart. To build an efficient database, which has been certified by our team members, Elysian Fly Company can expect a total cost ranging anywhere from $10,000- $15,000. The database will take an estimated three months to build and proofread. The company can stay rest assured knowing their data is in the secure hands of Mozart's top five excellent members.

Contents

Get to Know the Team: Mozart

Sahrin Moytree
Management Information Systems and Human Relations - Minor: Management
As a former student pilot, Moytree is passionate about connecting technology and humans in a creative way.

Sara Mullins
Management Information Systems and International Business - Minor: French
Mullins is a junior from Kansas City, Missouri. Her passion lies in cyber security and improving user experience through technology.

Khady Ndoye
Management Information Systems-Accelerated Track
Ndoye is an international student from Senegal. She is super interested in data science and machine learning.

Hillary Neaves

Management Information Systems

Neaves is a junior from OKC, OK and she has always had an interest in Business. She has been curious from the start regarding the way that computers and technology work. She loves MIS and enjoys learning more about coding and programming.

Lam Nguyen

Finance - Minor: Management Information Systems

Nguyen is an international student from Vietnam. He has always been interested in business, particularly in finance and consulting. He hopes to learn more about programming throughout his professional career as he feels it is an important set of skill

Conceptual Design

The conceptual design phase is the first stage in a database design process which includes design interactions, experience, and strategies. The goal during this stage is to output a conceptual data model that describes the main data entities, relationships, and constraints of a given problem. The builder must discover the characteristic of the data element during this stage. The phase calls for information collection, developing and gathering end-user data views, observing the current system in place, and being in touch with the systems design group.

The Client Meeting

On October 12th at 9:45am, Team Mozart met with Frederic Daugherty, the liaison for Elysian Fly Company. Team members Sahrin Moytree, Sara Mullins, Khady Ndoye, Hillary Neaves, and Lam Nguyen were present for the 15-minute discussion. The interview resulted in the team accumulating crucial information regarding the structure of the desired database. Mr. Daugherty stated his company demands a database that is fully functional in modelling their entire business. Their key demands revolve around a well-managed inventory, accessible information regarding top vendors and employees, automatic generation of customer information and orders, better product control regarding their status and discounts, and exceptional understanding of customer data and demands to make valuable decisions for the company.

- Meeting Time: October 12th - 9:45am
- Location: Michael F. Price College of Business – Room 3107
- Interviewers: Sahrin Moytree, Sara Mullins, Khady Ndoye, Hillary Neaves, Lam Nguyen
- Interviewee: Frederic Daugherty

Q&A During the Meeting & Information We Learned:

1. What testing do products have to go through in order to be carried?
Yes, there must be an attribute which measures the passing capacity of a product.
2. Is there a large demand for the "bundled" package of flies?
Yes, there is a huge demand for bundled packages. The company asks the database to model bundled packages separately.
4. Do we include the mailing list in the ERD?
Yes, all new and current customers join our mailing lists. This is how the company keeps track of our customers and uses it as a form of publicity. The database needs to model all customers regardless of how many products they have purchased.
5. Do you want an outsource entity?
Yes, Elysian Fly would like to track the outsourced for 3rd party packages.
6. Are all tourist guides permanent employees or are they a different entity?
Yes, all tourist guides are considered employees of the company. Seasonal or not.
7. Are local families who provide hand tied flies considered vendors?
Yes, any merchandise obtained from outside of the company will be considered a vendor's product.
8. Do certain employee/ guide servers have access to certain types of information or all information available?
Employees/guides only have access to information pertaining to their job.

The section below provides crucial information regarding Entity Relationship Diagrams and their functionality. The reader will explore what an ERD is and how it is useful to companies all over the globe. The ERD for Elysian Fly Company has been published below. After careful accumulation of required entities and a thorough inspection of relationships among them, Team Mozart found several assumptions regarding the database. The clarification of the following assumptions will strongly affect the functionality of the database constructed for the company.

Significant Assumptions

1. What is the ChannelTypeID? The ChannelTypeID is listed to include whether the order was an online order, a phone order, or an in-person order and has a relationship with SalesOrder.

2. Are all kinds of Employees accounted for? Yes! All current, former, and future employees of the company are accounted for.

3. Can an employee have more than one sale? Yes, an employee can have more than one sale. This is shown in the "zero-to-many" cardinality between Employee and SalesOrder.

4. Can a certain pattern or design be used on more than one fly? Or can it only be used once? A pattern or design can be used multiple times, not just once. This is shown in the reference table of Pattern off of Fly. A pattern or design can be used multiple times, but each fly can only have one pattern or design. This assumption is the same for size and colour.

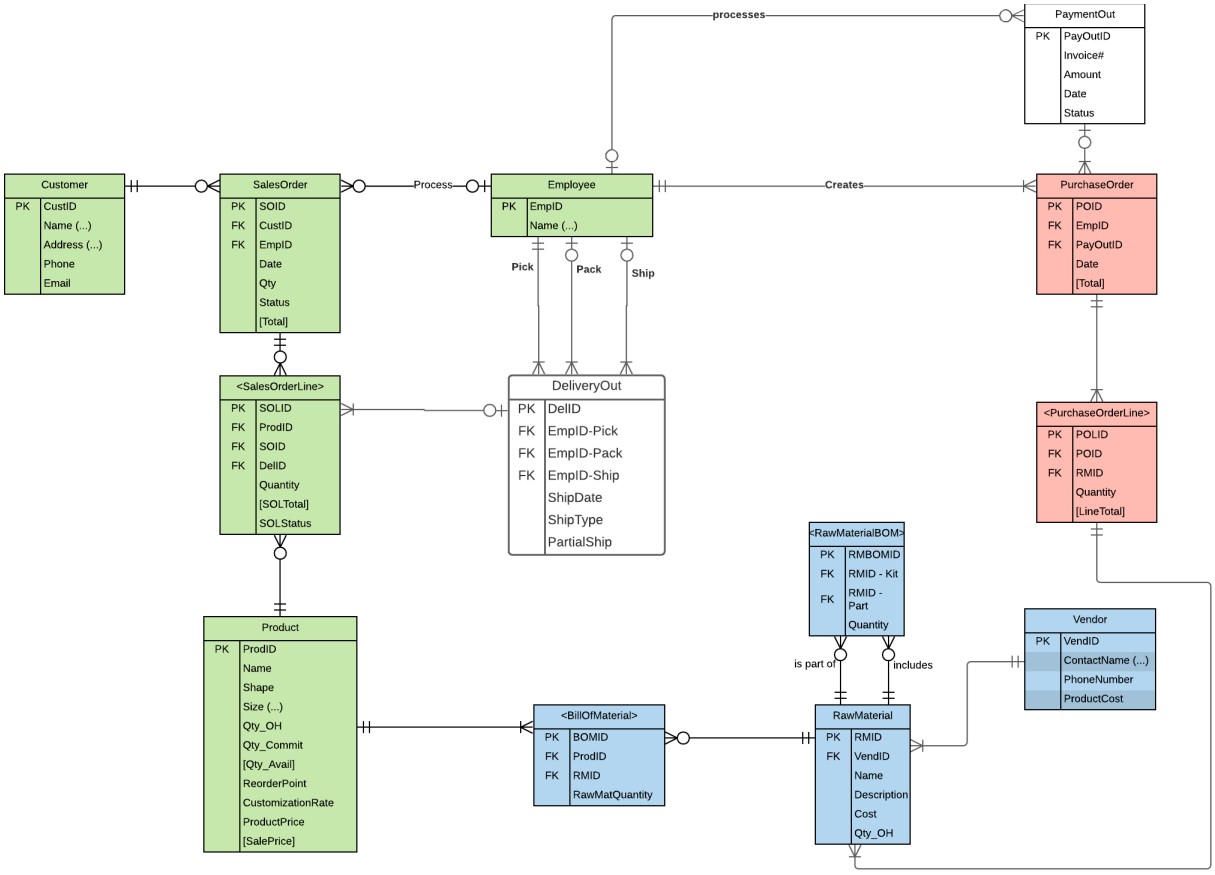
What is an ERD? Why is it necessary?

An Entity-Relationship diagram is a type of a structural diagram used in database design. The diagram calls for different symbols and connectors that visualize two important information: major entities within the project, and the inter-relationships among these entities. The data modeling technique is so in demand because it graphically illustrates an information system's entities and their relationships, thus, succeeding in effectively helping companies navigate the landscape of their business. The overview holistically, modelled by the entity-relationship diagram will help companies build the applications and resources, and communicate tasks needed to support their business.

Business Cycles Used

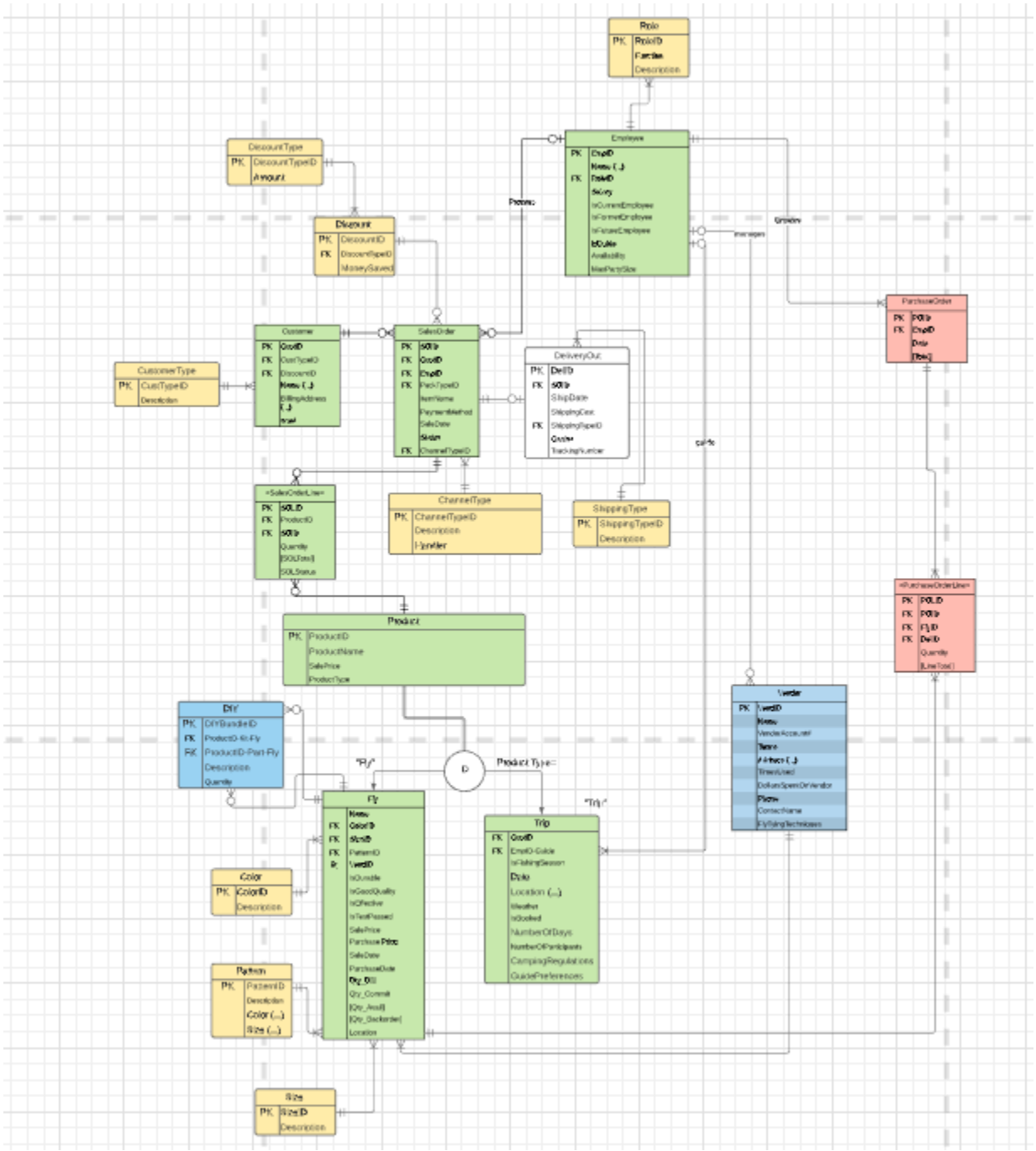
Three business cycles are used in the Entity Relationship diagram for Elysian Fly company. First and foremost, the **Production Cycle**, which is used since raw materials are being purchased from vendors to curate products for the company's inventory. However, only the unary many to many relationships is used from the production process. This is because there are many occurrences where two participants in a relationship are the same entity. The production process itself it not included. Second, the **Revenue Cycle** is utilized because the company is selling products. For example, the business of flies, trips, and bundles are all part of the revenue cycle. Lastly, the **Expenditure Cycle** is provided due to shipping, purchase order, and purchase of raw materials from vendors. The company is spending on necessary products.

Original Integrated Business Cycle

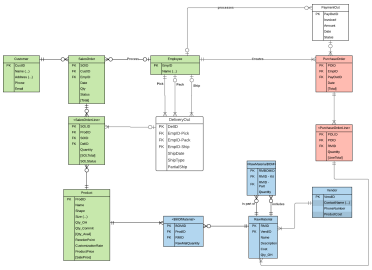
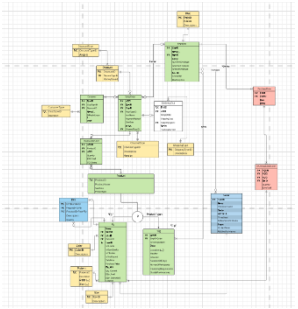
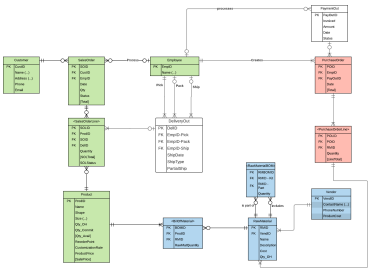
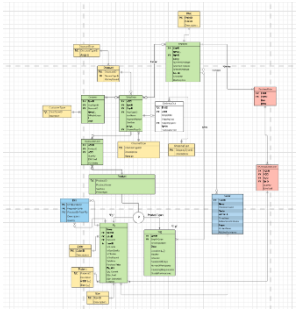
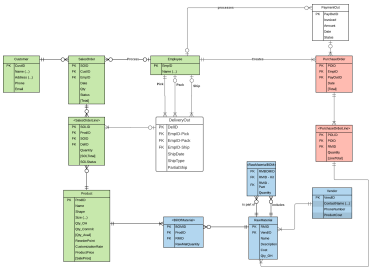
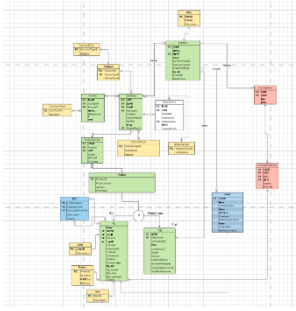
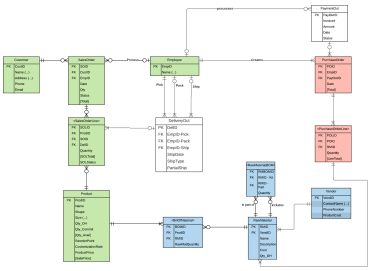
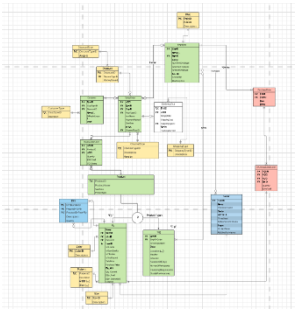


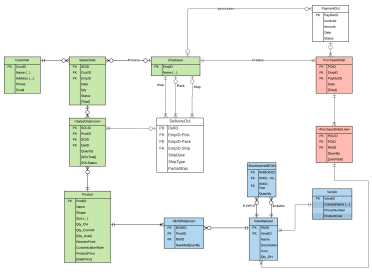
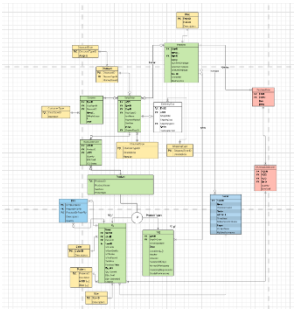
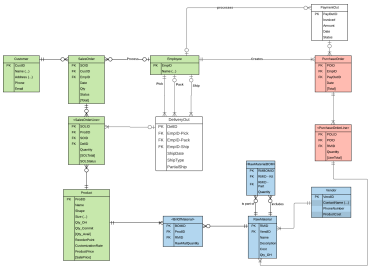
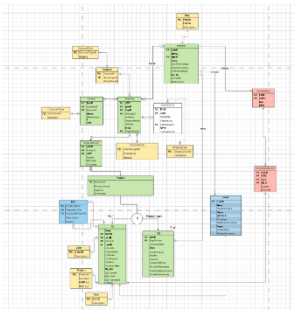
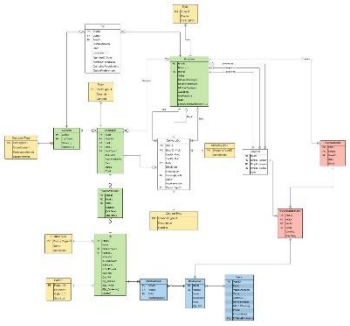
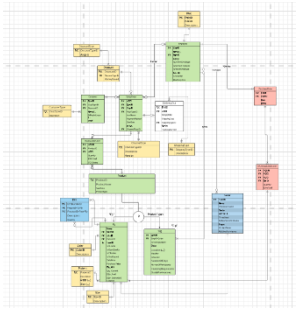
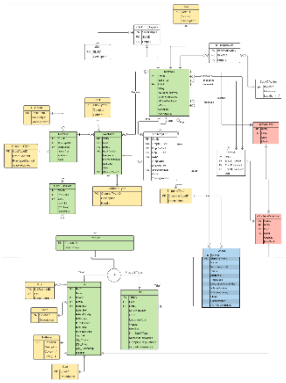
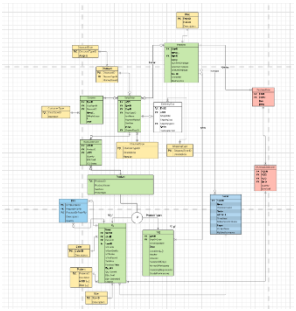
ERD Created

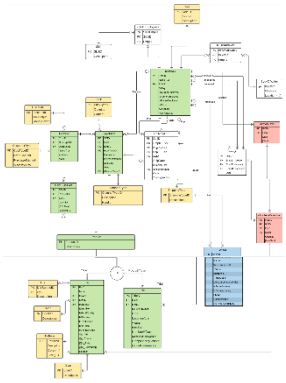
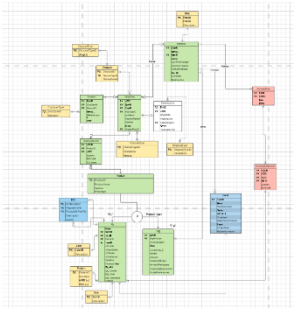
Elysian Fly Company

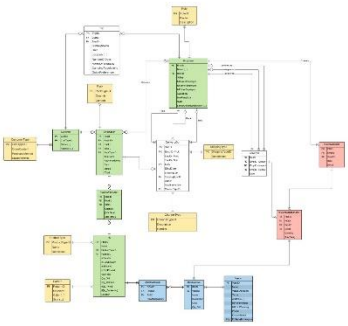
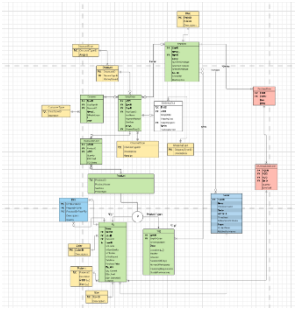


Changed made to generic ERDs

Change #	Original ERD	Updated ERD
Entities were removed from original Integrated business cycles due to the information not pertaining to resources need.	Original Integrated Business Cycle 	Refer to “ERD Created” 
Addition of a few entities, attributes, and reference tables to the integrated business cycles.	Original Integrated Business Cycle 	Refer to “ERD Created” 
Generated list of assumptions for the original integrated business cycle and its functionality. We wanted to make sure that it was clear what each attribute or relationship meant.	Original Integrated Business Cycle 	Refer to “ERD Created” 
When adding reference tables, we had to add/change the cardinality of each relationship. We had to make sure that each entity was connected to its reference tables with the correct cardinality.	Original Integrated Business Cycle 	Refer to “ERD Created” 

Color coding the tables was another change that we made to our ERD. When adding tables, we had to color code them based on what cycle they were in or what cycle they connected to.	Original Integrated Business Cycle 	Refer to “ERD Created” 
Another change we made was changing the name of entities or reference tables to make it even more clear what we were listing. We thought that labeling the entities with names that pertained to the project, instead of just general names, would make it easier for the client to read.	Original Integrated Business Cycle 	Refer to “ERD Created” 
A major change that we made was adding sub-type/super-types to our ERD. In our original ERD, we created multiple reference tables instead of sub-type/super-types, but changed that in our updated one.	Milestone 1 ERD 	Refer to “ERD Created” 
A new change that we made was adding email and billing address in the Customer entity.	Milestone 2 ERD 	Refer to “ERD Created” 

Another change that we made was moving the relationship Discount had with Customer to Sales Order entity.	Milestone 2 ERD 	Refer to “ERD Created” 

Another change that we made was fixing the cardinality on some of our entities. While learning more about our Company, we were able to make more informed decisions on the cardinality relationships.	Milestone 1 ERD 	Refer to “ERD Created” 

Logical Design

The logical database design is the simple process of deciding how to arrange the attributes of the entities in each business environments into database structures. The goal of logical database design is to create well-structured relational databases by converting entity-relationship diagrams into relational tables. The tables will manage to store data regarding a company's entities in a non-redundant manner, along with placing foreign keys so that all relationship among the entities will be supported.

Normalization

Normalization is the process of reorganizing data within a database to reduce data redundancy. This process is crucial because it allows databases to take up as little disk space as possible, therefore, creating increased performance. The first goal during data normalization is to detect and eliminate all duplicate data. This is done by logically grouping data redundancies together. Once all anomalies and unstructured data is processed into a structured form, normalization improves the usability of a data set. As redundancies are merged, data can be visualized more easily, insights can be extracted more efficiently, information can be updated more quickly, and the presence of errors much less. This process is important to the Elysian Fly Company because it will help Mozart do the implementation for the database. It is also needed to make SQL queries.

Normalized Relations

TState (StateID, StateName)

TZipCode (ZipCodeID, ZCity, ZStateID)
Foreign key ZStateID references TState
Not Null
On Delete Restrict

TCustomerType(CustTypeID, CTDescription)

TDiscountType(DiscountTypeID, DTDescription)

TDiscount(DiscountID, DDiscountTypeID, DMoneySaved)
Foreign key DDiscountTypeID references TDiscountType
Not Null
On delete restrict

TCustomer (CustID, CustTypeID, CustZipCodeID, CustFirstName, CustLastName, Custemail)
Foreign key CustTypeID references TCustomerType
Not Null
On Delete Restrict
Foreign key CustZipCodeID references TZipCode
Not Null
On Delete Restrict

TRole (RoleID, RFunction, RDescription)

TEmployee (EmpID, EmpRoleID, EmpFirstName, EmpLastName, EmpSalary, IsCurrentEmployee, IsFormerEmployee, IsFutureEmployee, IsGuide, EmpAvailability, EmpMayPartySize)
- Foreign key EmpRoleID references TRole
  - Not Null
  - On Delete Restrict

TChannelType(ChannelTypeID, ChanDescription, ChanHandler)

TSalesOrder (SOID, SOCustID, SOEmpID, SOPackTypeID, SOChannelTypeID, SODiscountID, SOItemName, SOPaymentMethod, SOSaleDate, SOStatus)
- Foreign key SOCustID references TCustomer
  - Not Null
  - On Delete Restrict
- Foreign key SOEmpID references TEmployee
  - Null Allowed
  - On Delete Cascade
- Foreign key SOPackTypeID references TPack
  - Not Null
  - On Delete Restrict
- Foreign key SOChannelTypeID references TChannelType
  - Not Null
  - On Delete Restrict
- Foreign key SODiscountID references TDiscount
  - Not Null
  - On Delete Restrict

TProduct (ProductiD, ProdName, SalePrice, ProductType)

TSalesOrderLine (SOLID, SOLProductID, SOLSOID, SOLQuantity, SOLStatus)
- Foreign Key SOLProductID references TProduct
  - Not Null
  - On Delete Restrict
- Foreign Key SOLSOID references TSalesOrder
  - Not Null
  - On Delete Restrict

TColor(ColorID, ColorDescription)

TPattern(PatternID, PatDescription, PatColor, PatSize)

TSize(SizeID, SizeDescription)

TDIY(DIYBundleID, DIYFlyProductID-Kit, DIYFlyProductID-Part, DIYDescription, DIYQuantity)

Foreign Key DIYFlyProductID-Kit references TFly
Not Null
On Delete Restrict

Foreign Key DIYFlyProductID-Part references TFly
Not Null
On Delete Restrict

TFly(FlyProductID, Flyname, FlyColorID**,** FlySizeID**,** FlyPatternID, FlyisDurable, FlyisGoodQuality, FlyisEffective, FlyisTestPassed, FlySalesPrice, FlyPurchaseCost, FlyQty_OH, FlyQty_Commit, FlyQty_Avail, FlyQty_Backorder, FlyLocation, PurchaseDate, SaleDate)
Foreign Key FlyColorID references TColor
Not Null
On Delete Restrict
Foreign Key FlySizeID references TSize
Not Null
On Delete Restrict
Foreign Key FlyPatternID references TPattern
Not Null
On Delete Restrict

TTrip(TripProductID, TripCustID**,** TripGuideEmpID, TripisFishingSeason, TripDate, TripZipCodeID, TripWeather, TripisBooked, TripNumofDays, TripNumofParticipants, TripRegulations, TripGuidePreferences) key

Foreign Key TripCustID references TCustomer
Not Null
On Delete Restrict
Foreign Key TripGuideEmpID references TEmployee
Not Null
On Delete Restrict
Foreign Key TripZipCodeID references TZipCode
Not Null
On Delete Restrict

TShippingType(ShippingTypeID, SPTDescription)

TDeliveryOut(DellID, DOSOID, DOShipDate, DOShippingCost, DOShippingTypeID, DOCarrier, DOTrackingNumber)
Foreign Key DOSOID references TSalesOrder
Not Null
On Delete Restrict
Foreign Key DOShippingTypeID references TShippingType
Not Null
On Delete Restrict

TPurchaseOrder(POID, POEmpID, PODate, POTotal)
Foreign Key POEmpID references TEmployee
Not Null
On Delete Restrict

TPurchaseOrderLine(POLID, POLPOID, POLFlyID, POLDellID, POLQuantity, POLLineTotal)
Foreign Key POLPOID references TPurchaseOrder
Not Null
On Delete Restrict
Foreign Key POLFlyID references TFly
Not Null
On Delete Restrict
Foreign Key POLDellID references TDeliveryIn
Not Null
On Delete Restrict

TVendor(VendID, VName, VVendorAccount#, VTerms, VZipCodeID, VTimesUsed, VDollarsSpentOnVendor, VPhone, VContactName, VFlyingTechniques)
Foreign Key VZipCodeID references TZipCode
Not Null
On Delete Restrict

Differences between ERD and Normalized Relations

An entity relationship diagram defines the relationship between entities and their attributes. Normalization occurs when a database maintains a set of separate, related files (tables), but combines data elements from the files for queries and reports when required. In short, an ERD is an abstract concept of a database, it speaks in entities and attributes. A normalization relational model defines formats and relations in a way a database could understand, a data model. The three key differences between ERD and normalized relations are atomicity, no data duplication issues, and well-structured data. The differences made between the Entity Relationship Diagram and normalization relations for Elysian Fly company are minor yet provides a much more efficient database output. First and foremost, ‘Location’ was changed by creating TZipCode and TState to avoid data redundancy. Second, ‘Name’ is composite in the Elysian Fly Company ERD for the entities of ‘EMPLOYEE’ and ‘CUSTOMER’, therefore, it was split into ‘FirstName’ and ‘LastName’ in the logical design to avoid partial functional dependency. Lastly, the subtypes. Fly and Trip, were given primary keys to specify them. It is beneficial to have normalized relations because it provides a more effective customer profiles, optimized internal resources, reduced response time and offers additional guarantee.

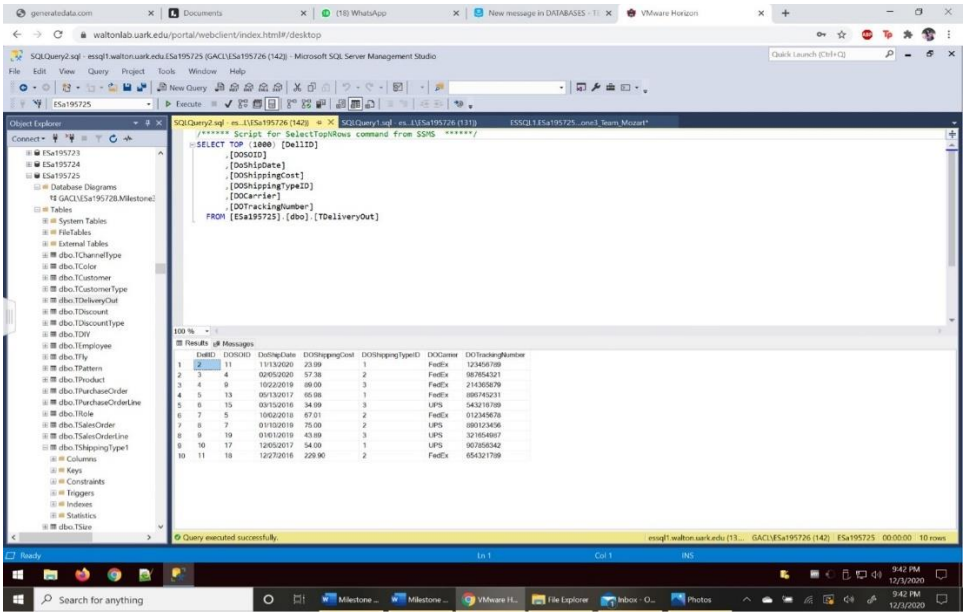
Referential Integrity

Referential integrity refers to the accuracy and consistency of a data within a relationship. The rule requires that if a foreign key value is used, it must reference a valid and existing primary key in the parent table (primary key). Referential integrity prevents users from adding data to a related table if there is no associated data in the primary table, changing values in a primary table that results in orphaned data in a related table, and deleting data from a primary table if there are no related records. The lack of referential integrity in a database can lead to incomplete data being returned with no notification of error. This could lead to data being lost in the database because they are never received in queries or reports. It is significant to the case of the Elysian Fly Company because the lack of referential integrity can cause problems such as customers not receiving orders they paid for. Two other integrity constraints are domain and entity. A domain constraint can be defined as the definition of a valid set of values for an attribute. The data type of domain includes string, character, integer, time, date, currency, etc. The value of the attribute must be available in the corresponding domain. Lastly, the entity integrity requires that each entity has a unique key. For example, if every row in a table represents relationships for a unique entity, the table should have one column or a set of columns that provides a unique identifier for the rows of the table. In simpler words, the entity integrity's focus is to define the parent key

Physical Design and Implementation

Below, you will find screenshots of the different tables we have created in our physical design.

TDeliveryOut:



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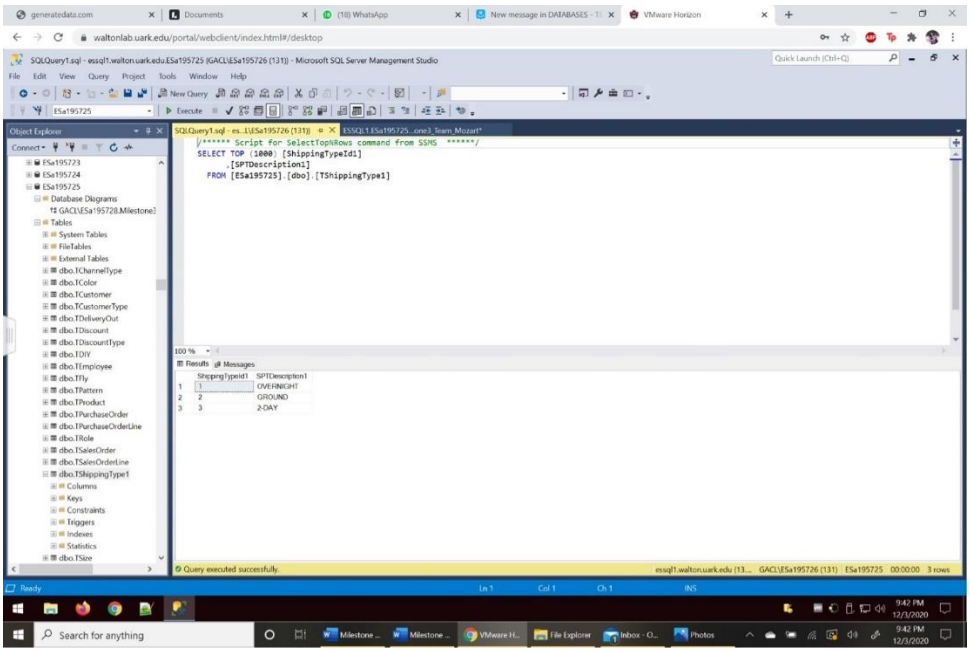

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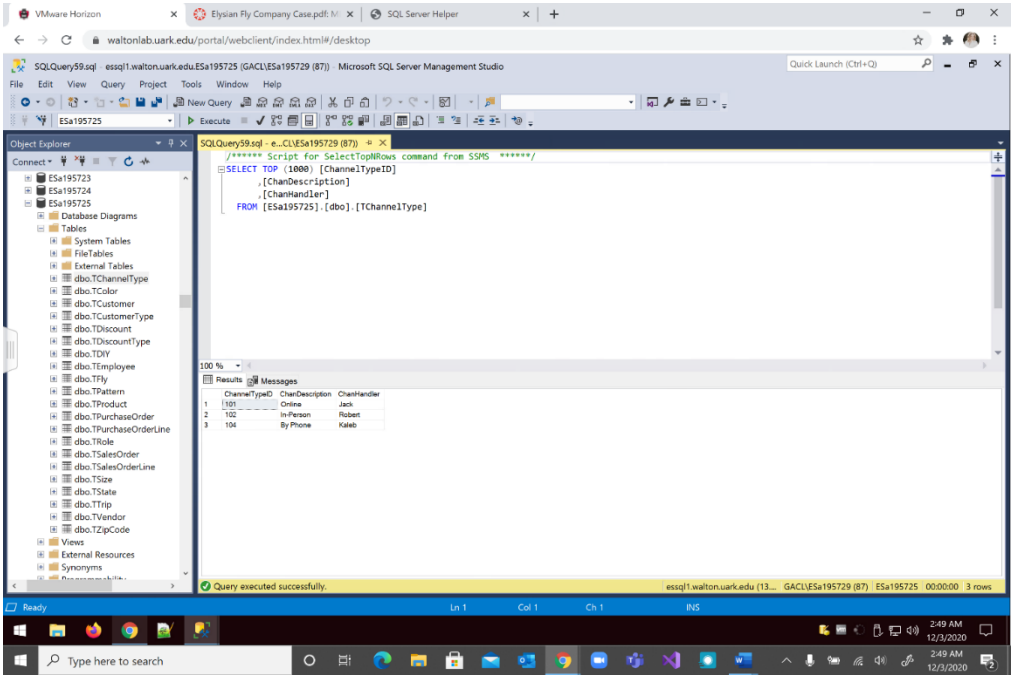

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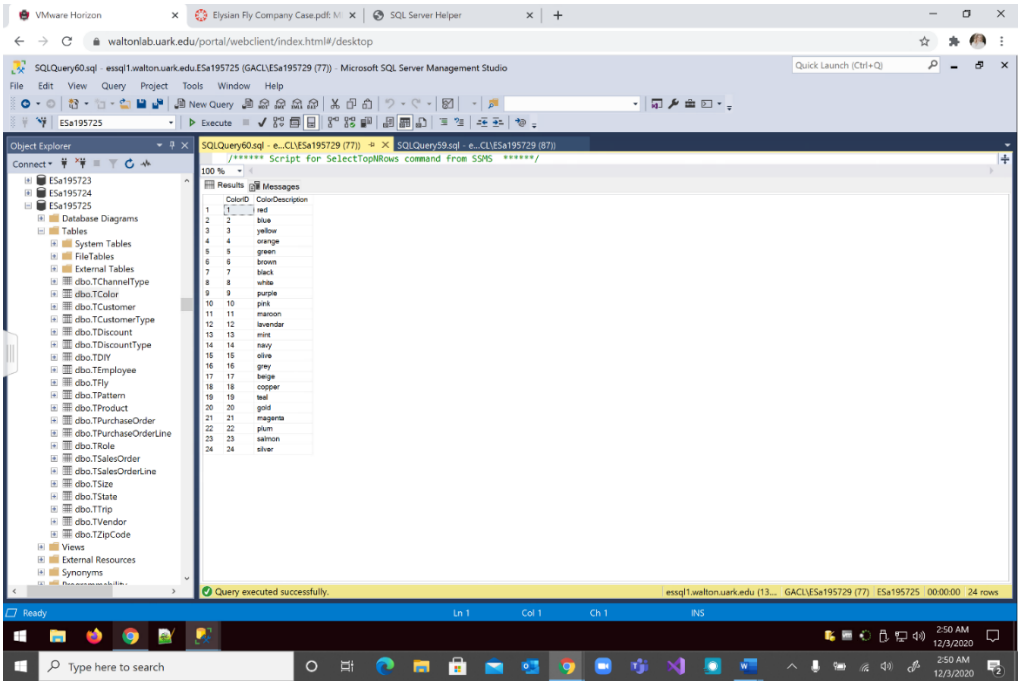

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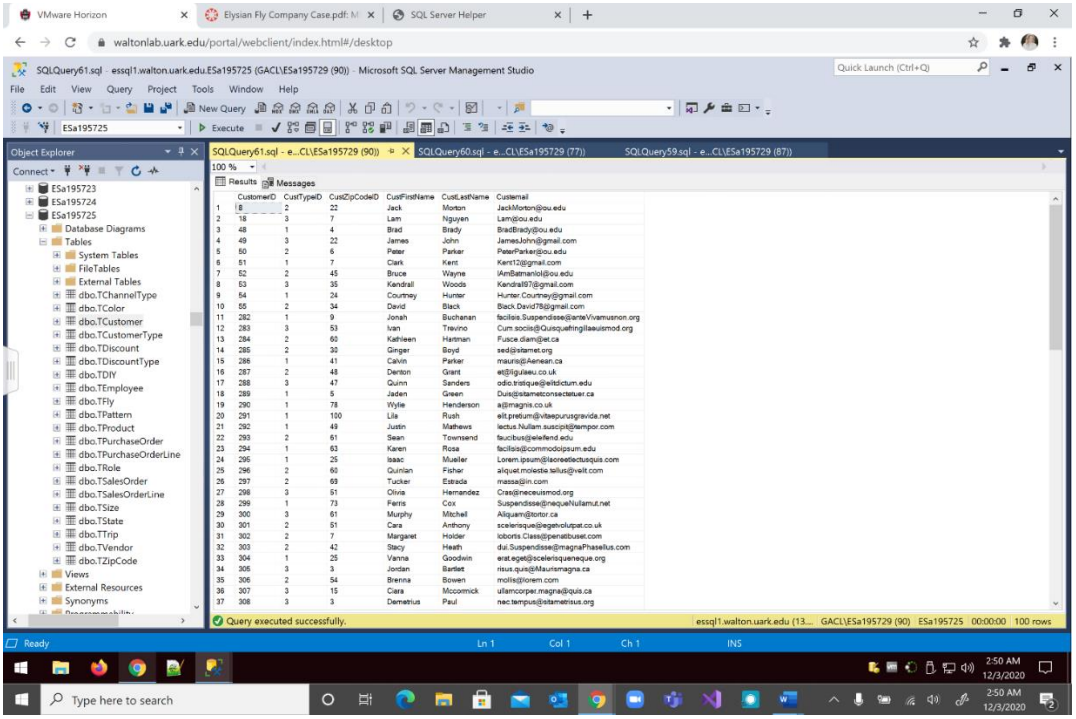

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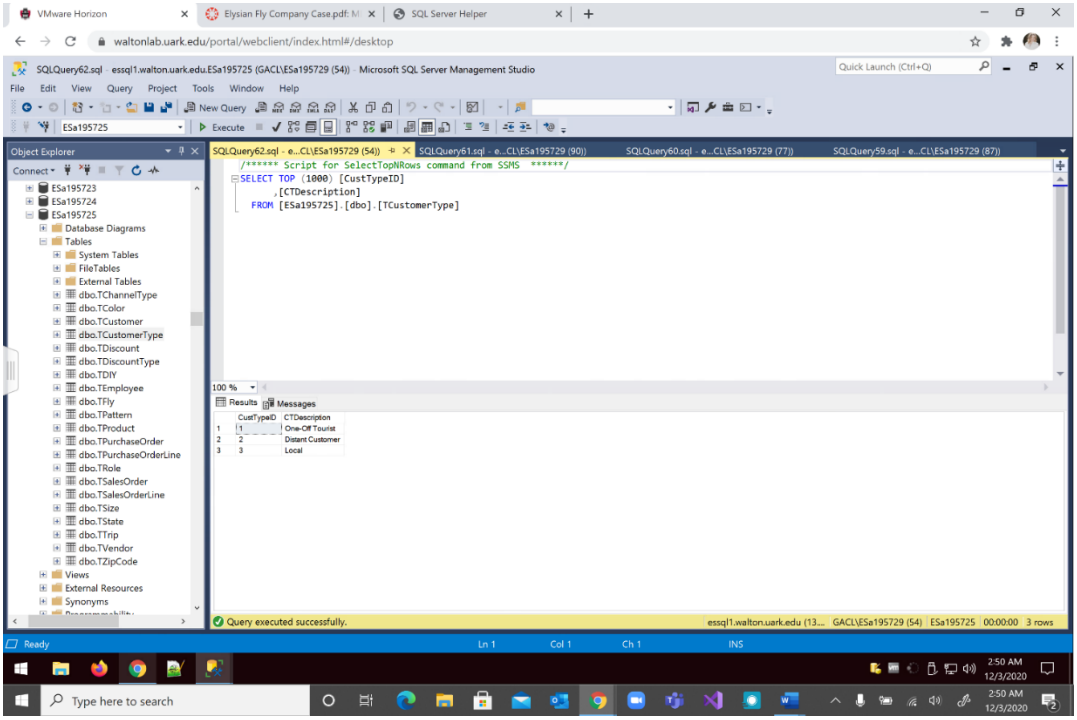

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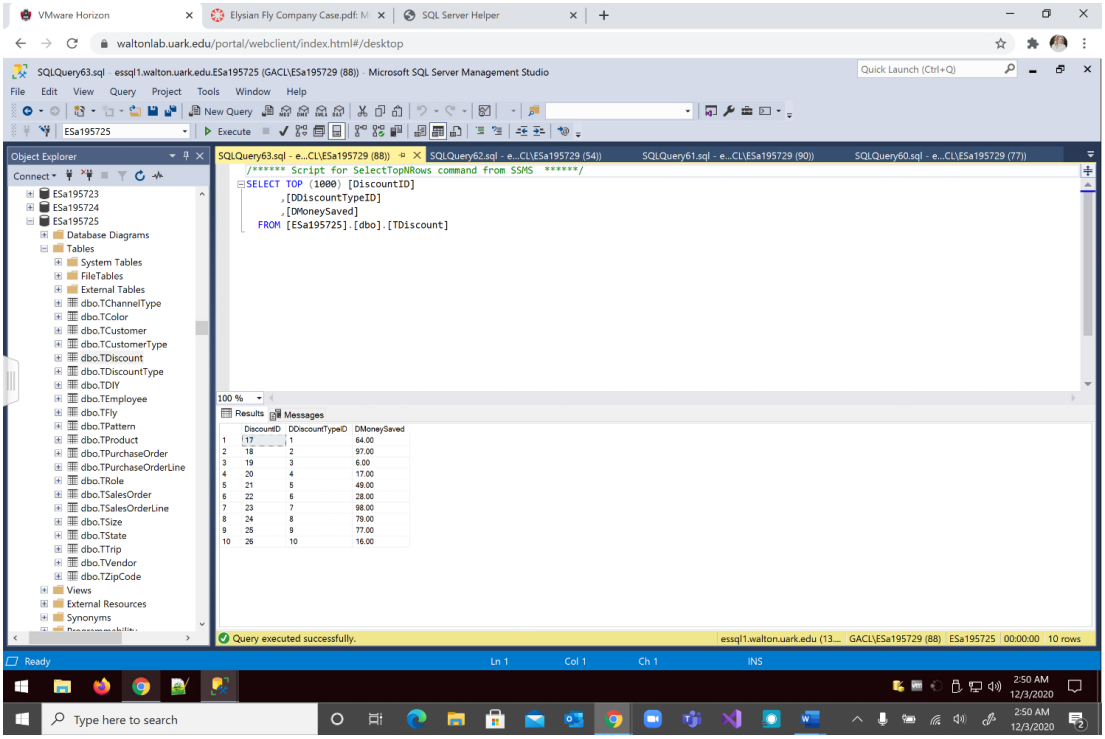

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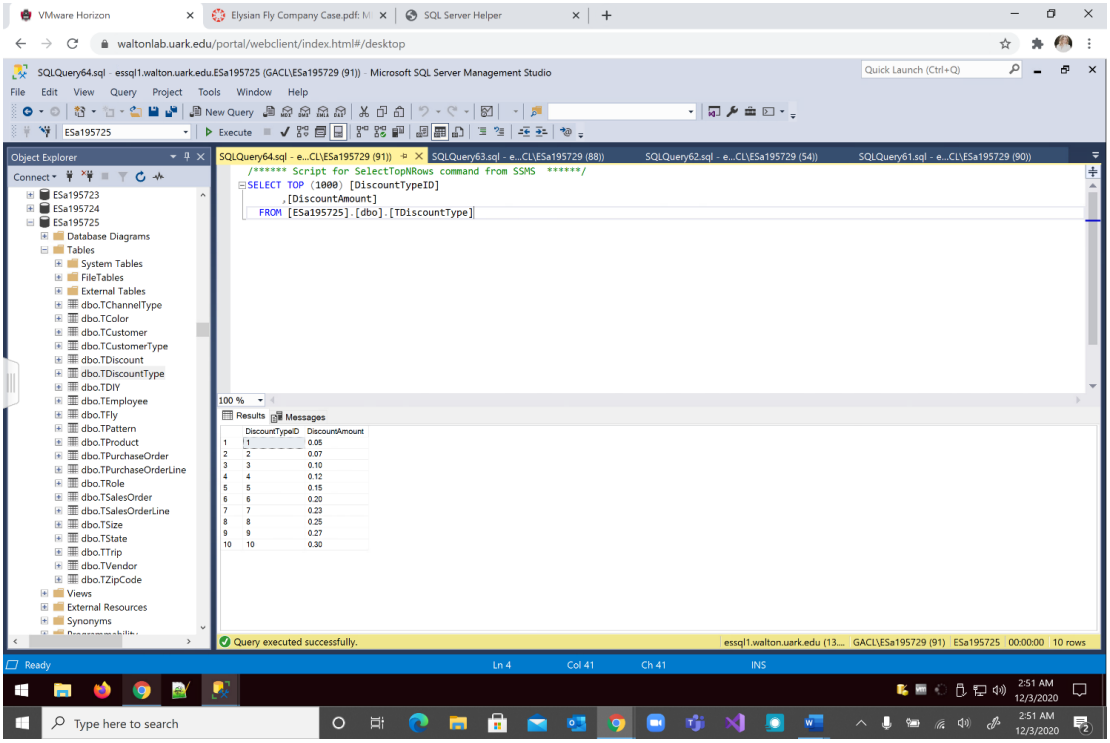

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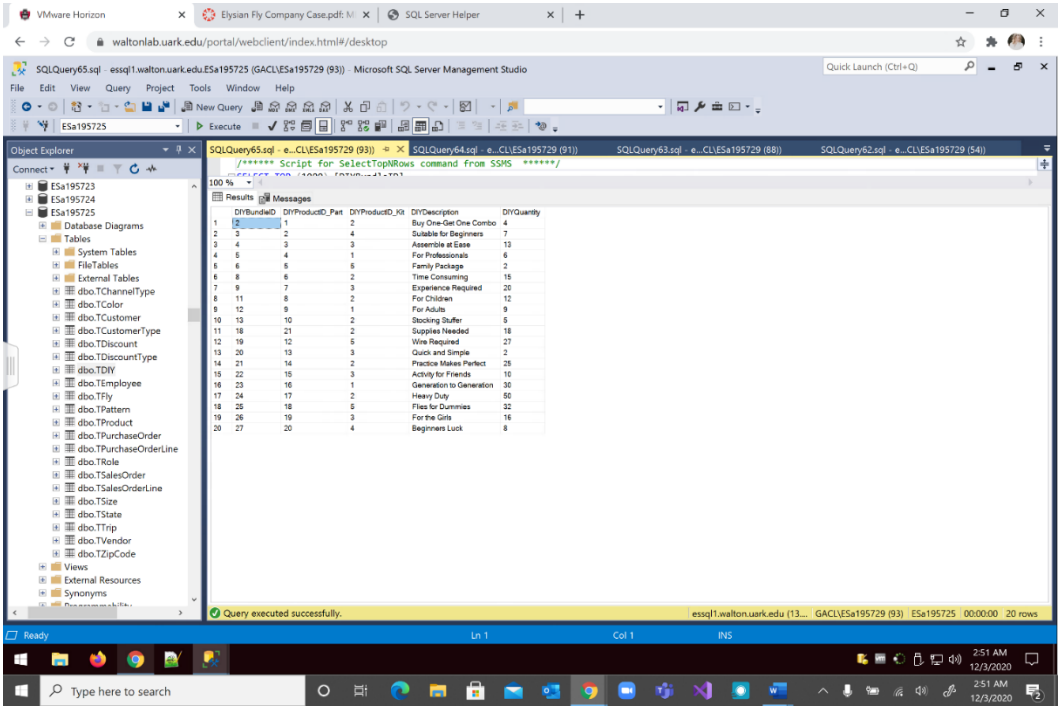

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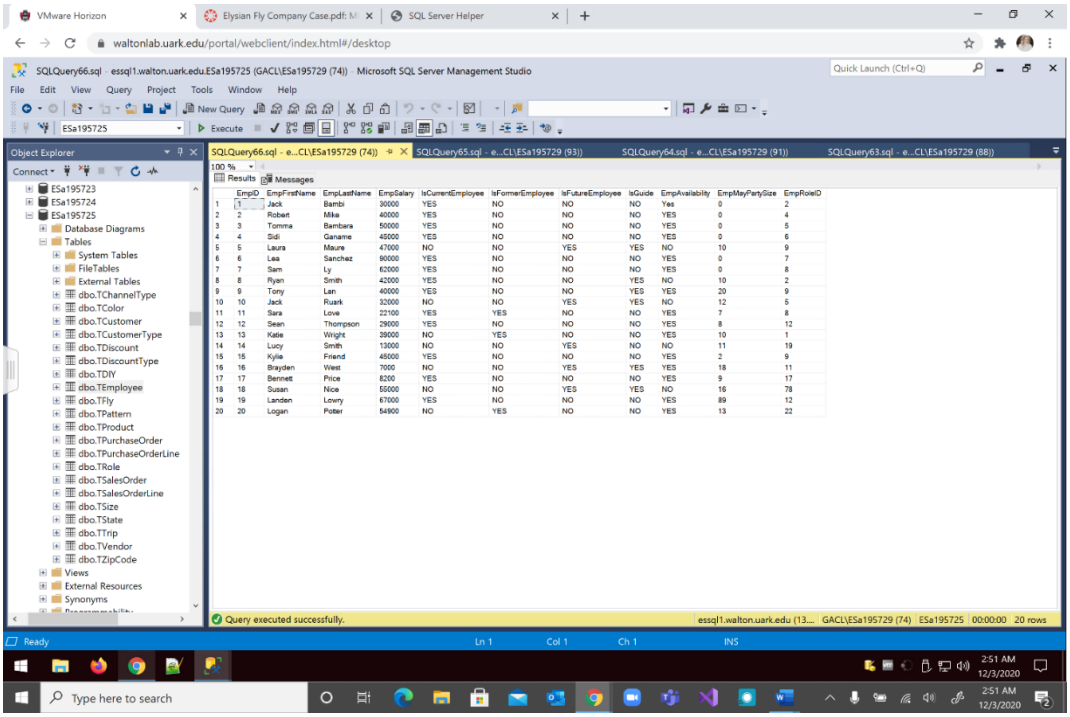

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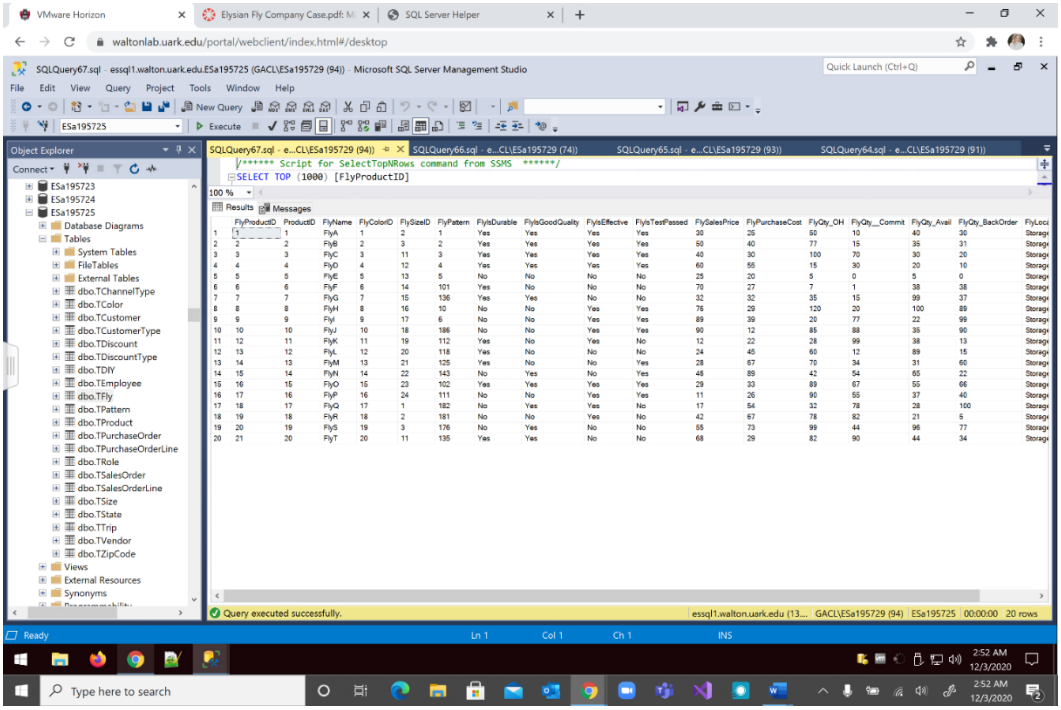

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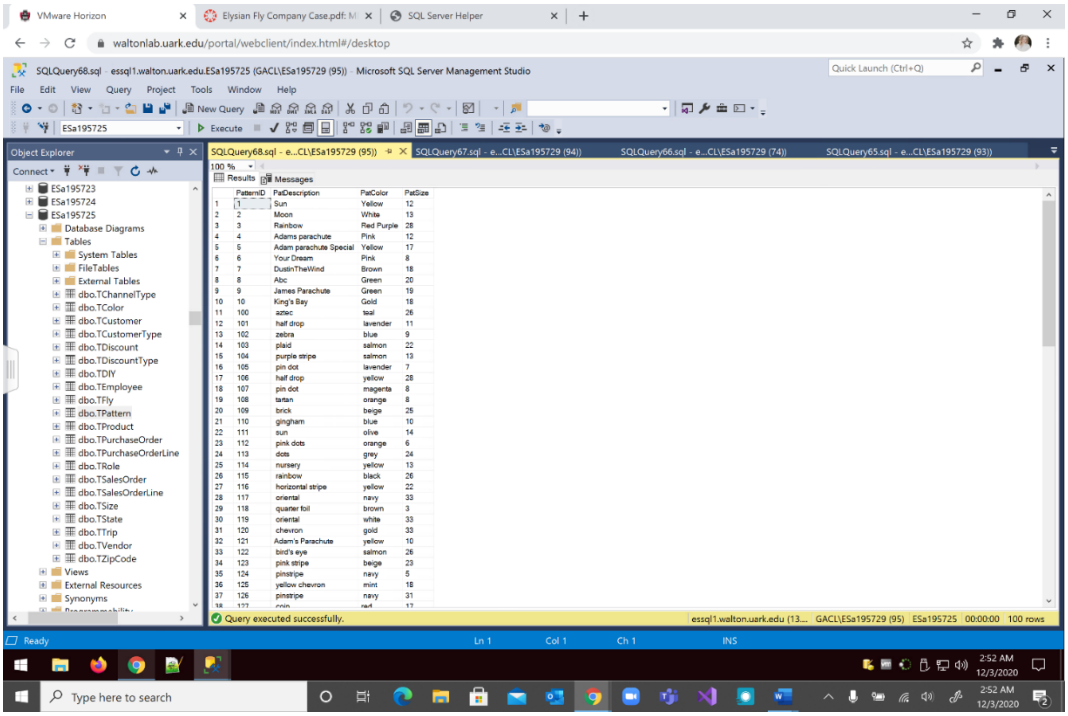

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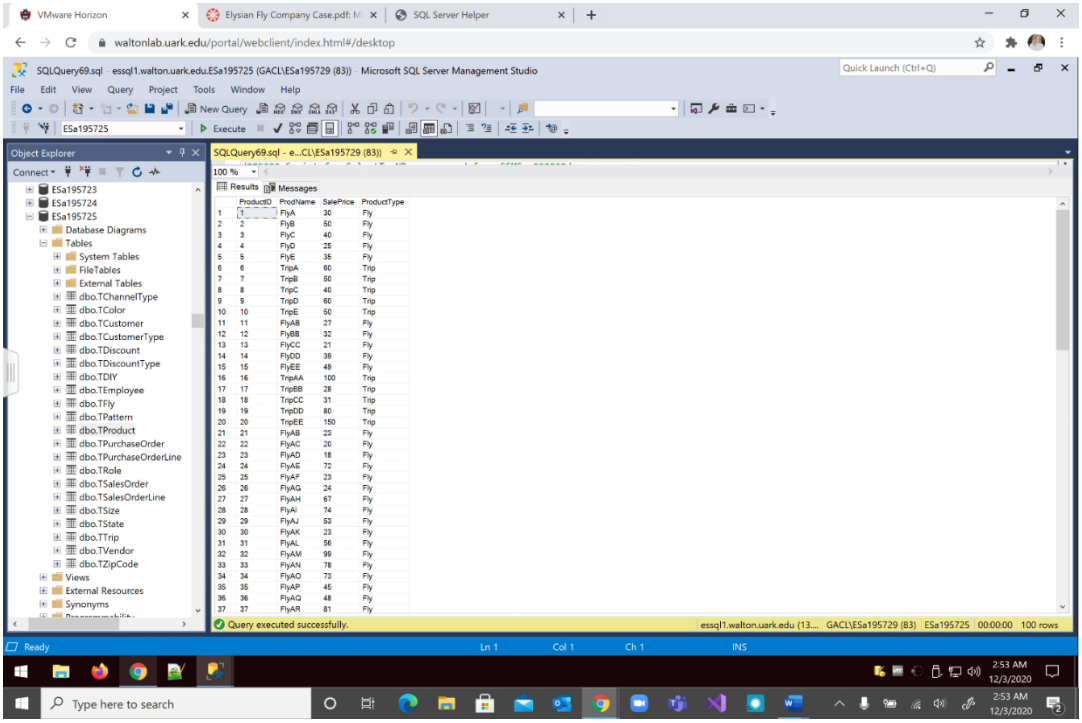

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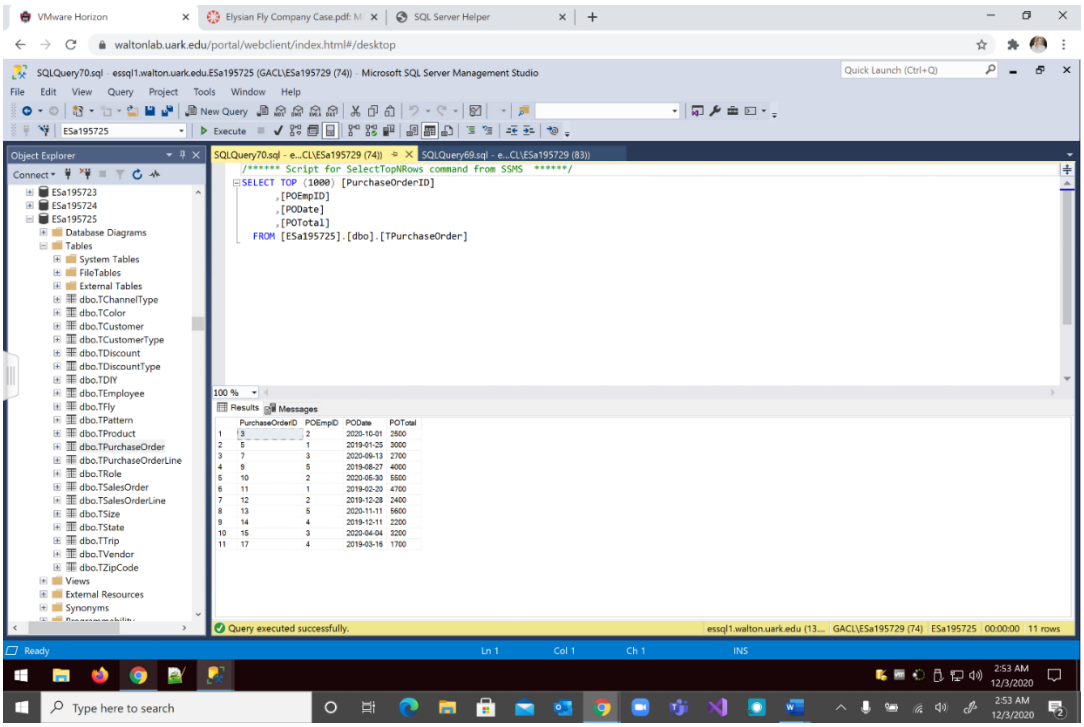

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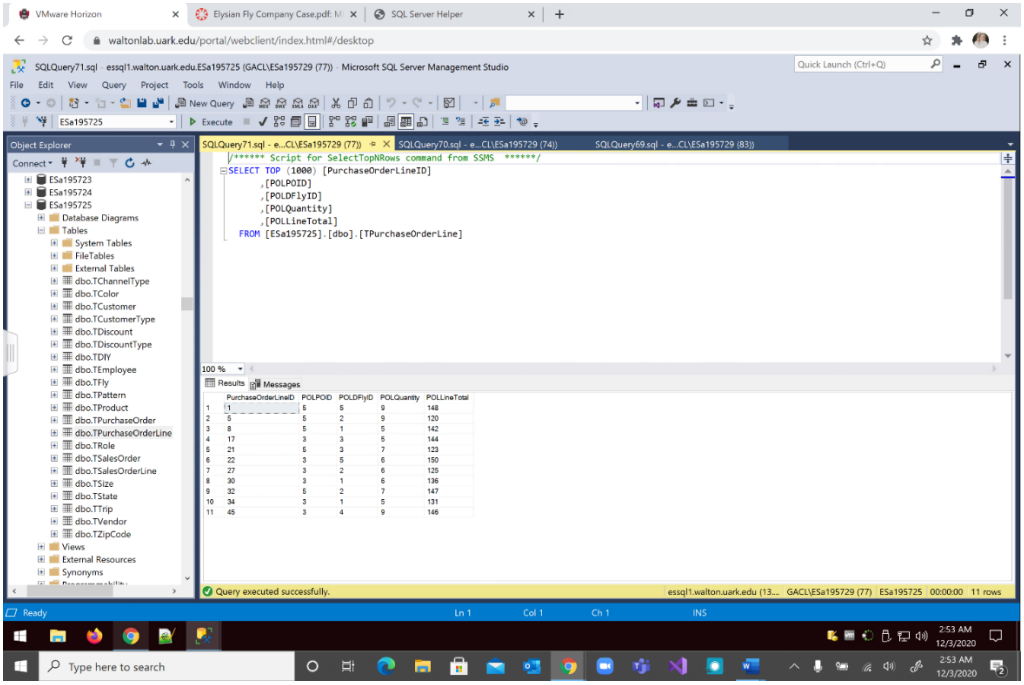

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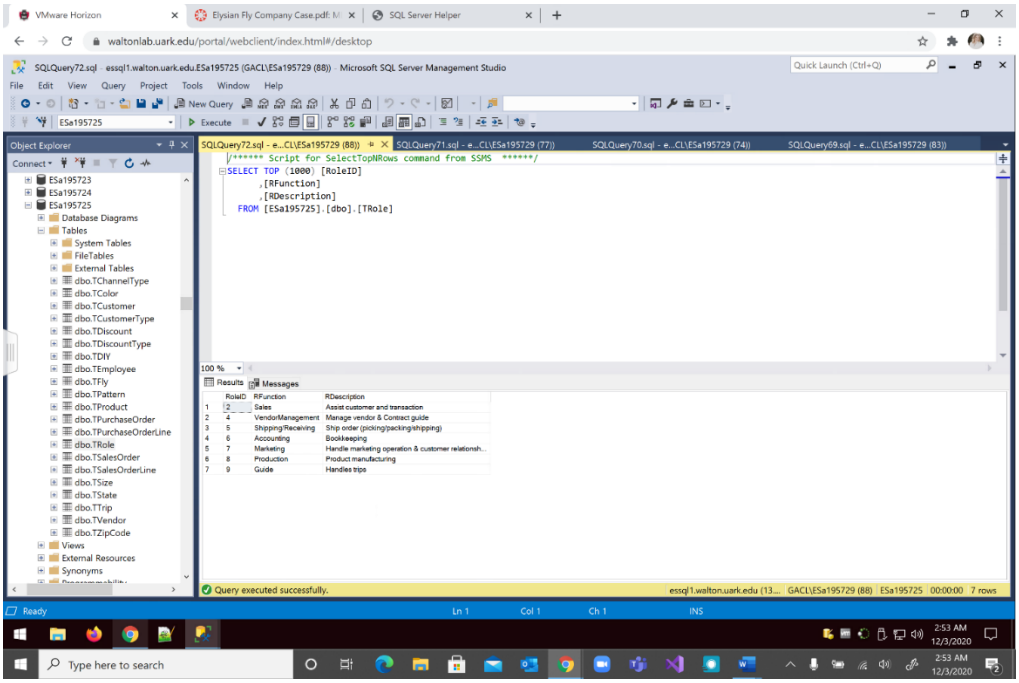

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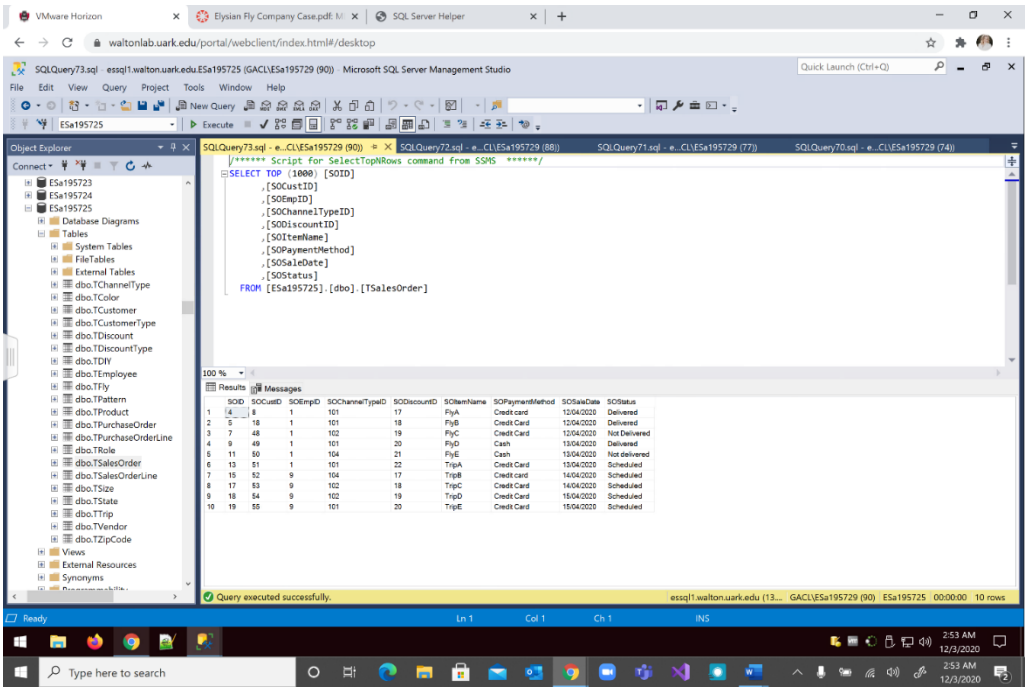

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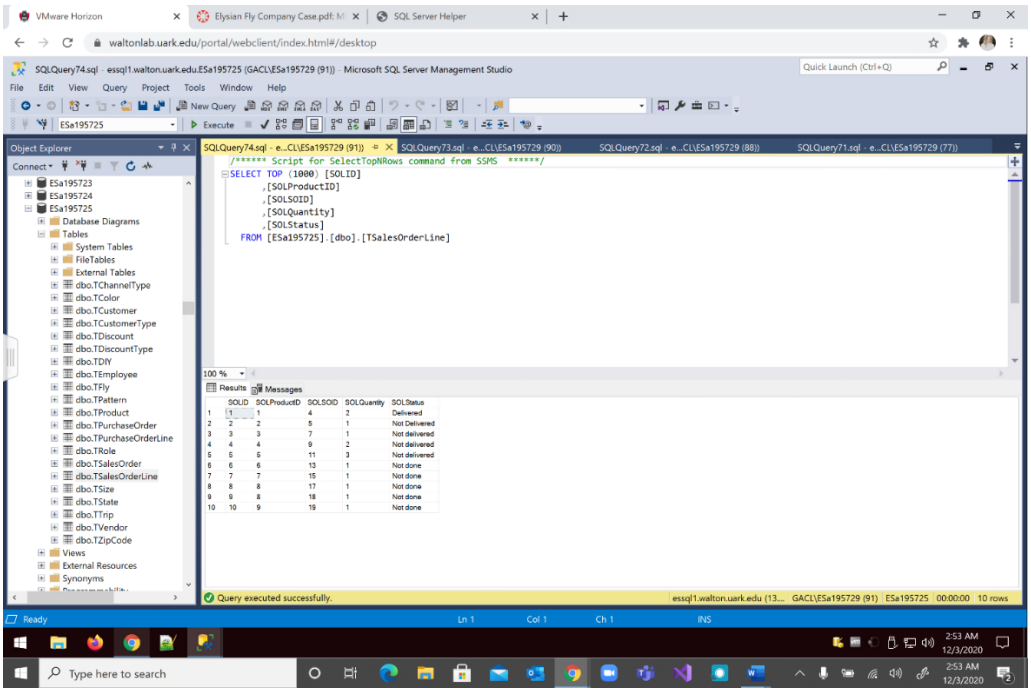

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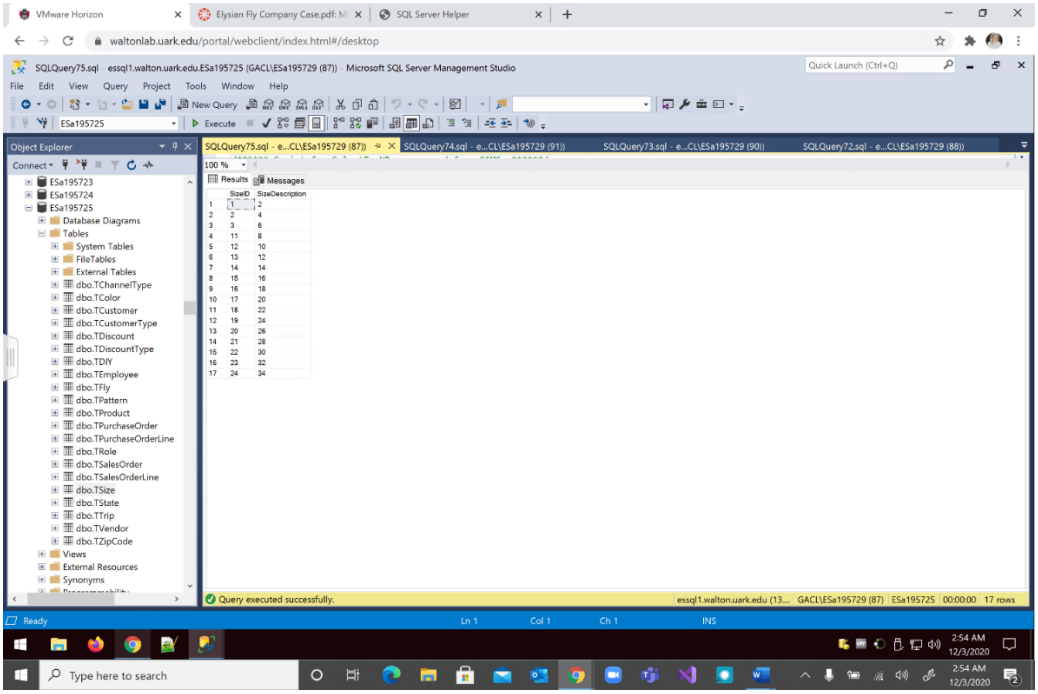

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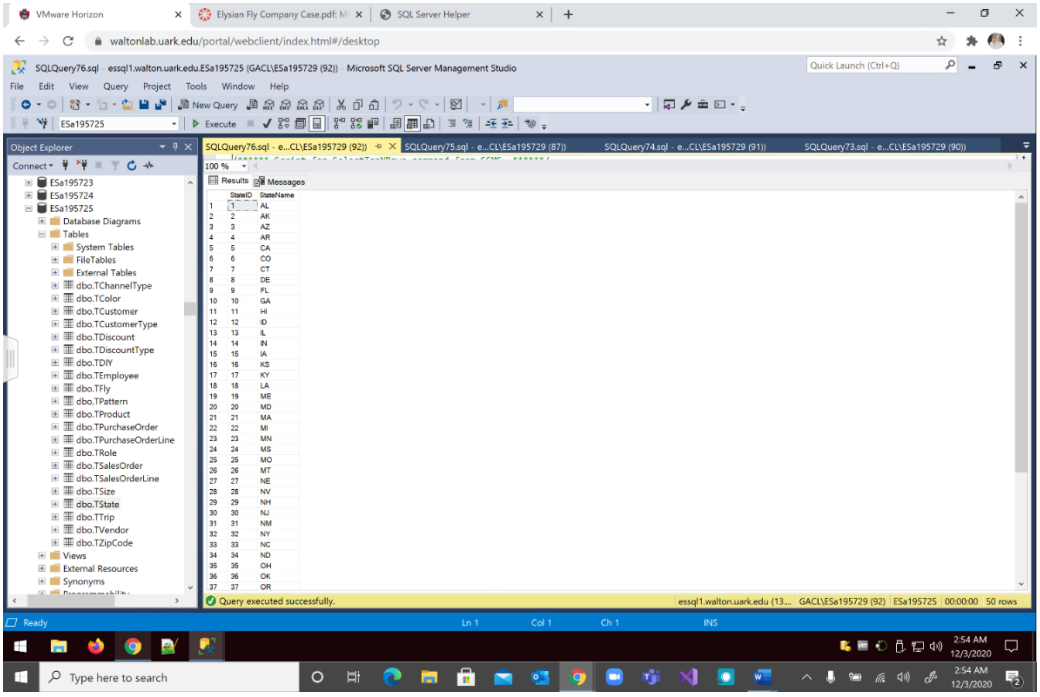

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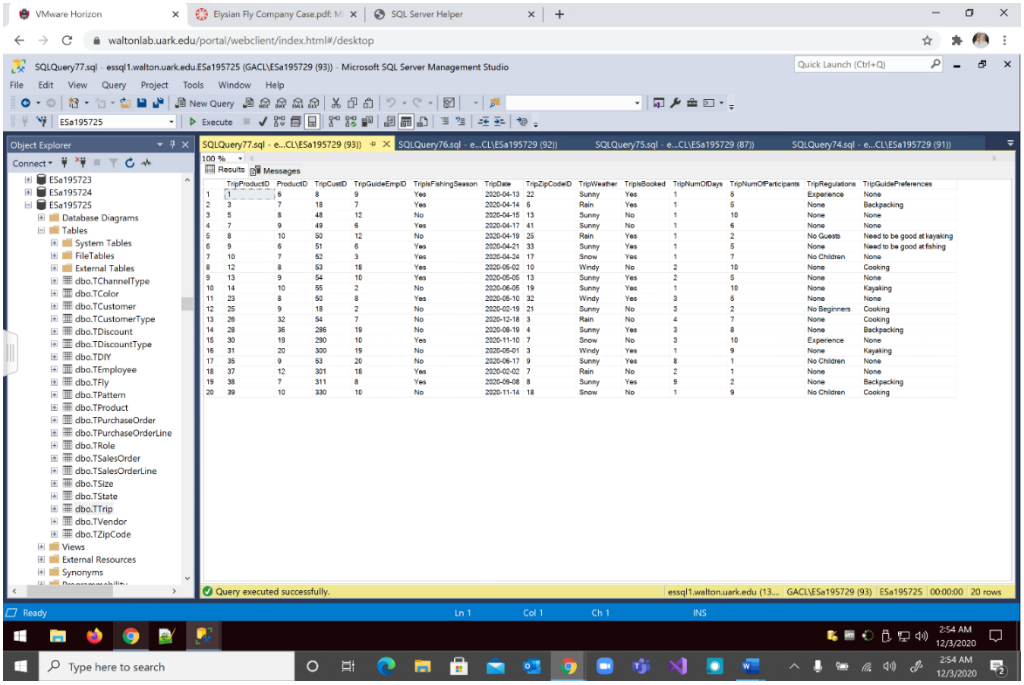

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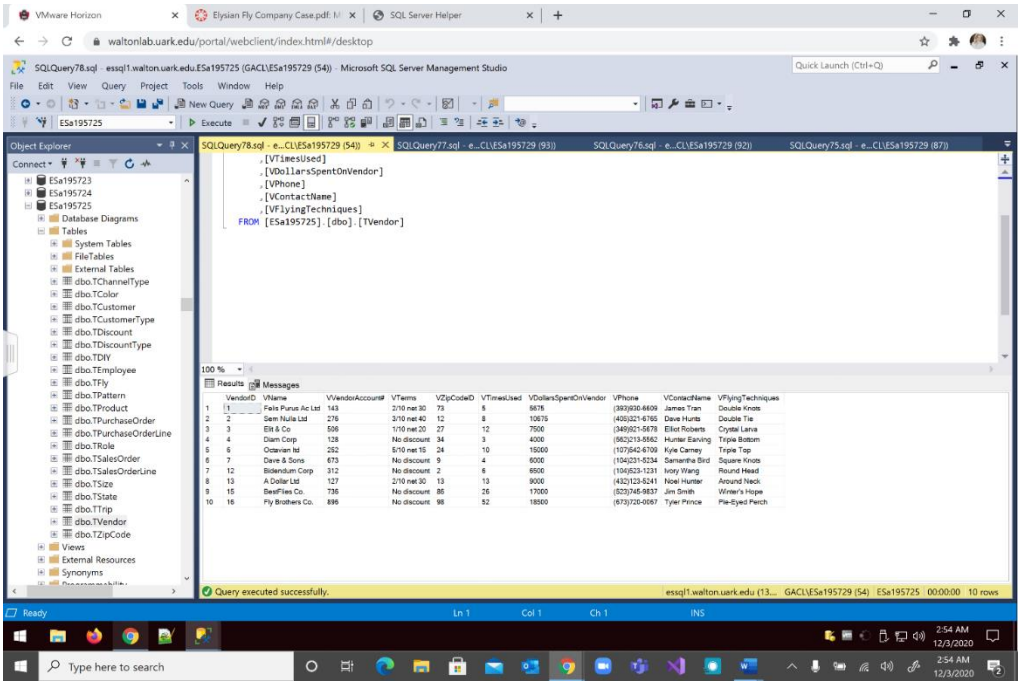

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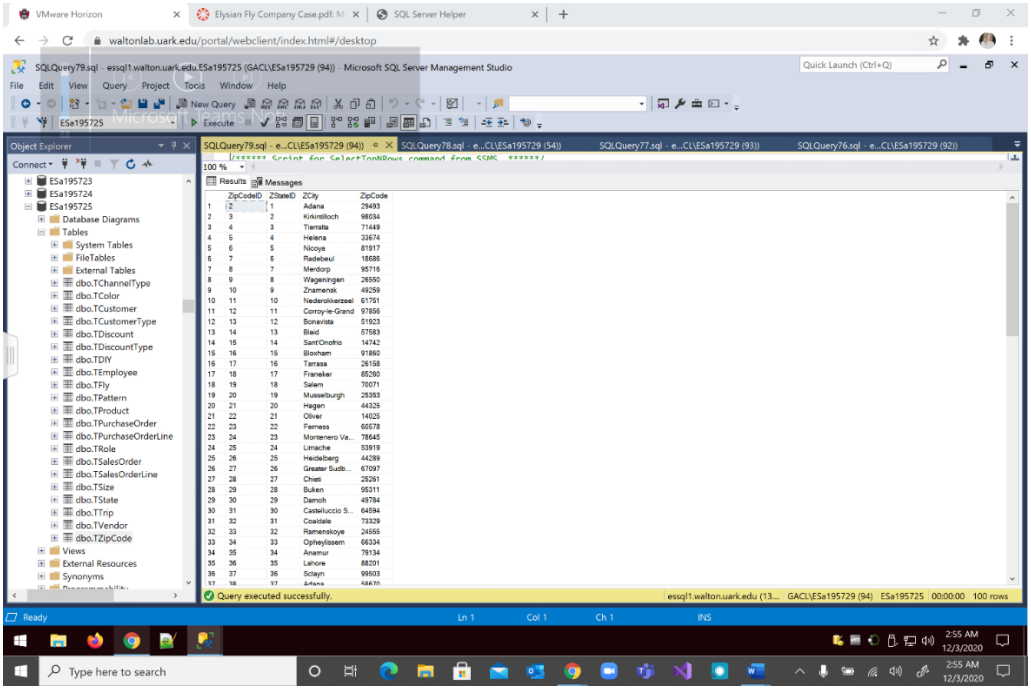


Data Dictionary

A Data Dictionary is a set of names, data, ID numbers, emails, or any other kind of attribute that are being used in a database. The Data Dictionary helps to describe the data that is within the table and can also be used to list references, data types, primary and foreign keys, and more. Using it, users can organize their data before writing it in their code so that they can evaluate what type of data they will be using. The Data Dictionary can be important because it shows exactly how the data will be used. It also makes the data easier to understand and comprehend, by providing a concise table. Using the Data Dictionary has been helpful for the Elysian Fly Company Project because there is a long list of data that has to be executed, and the Data Dictionary table helps to organize the data that employees will need to reference. A complete Data Dictionary is listed below in the appendix.

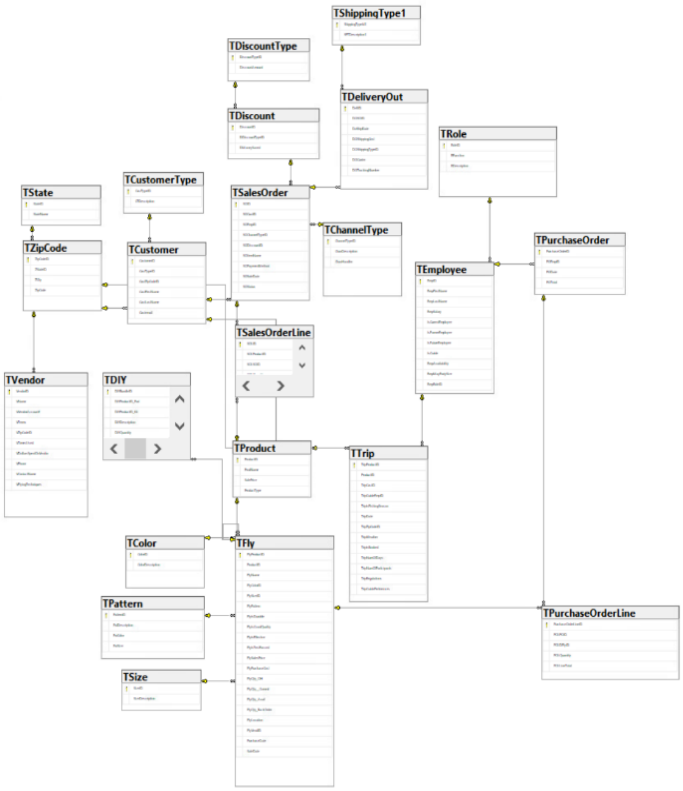
Denormalization

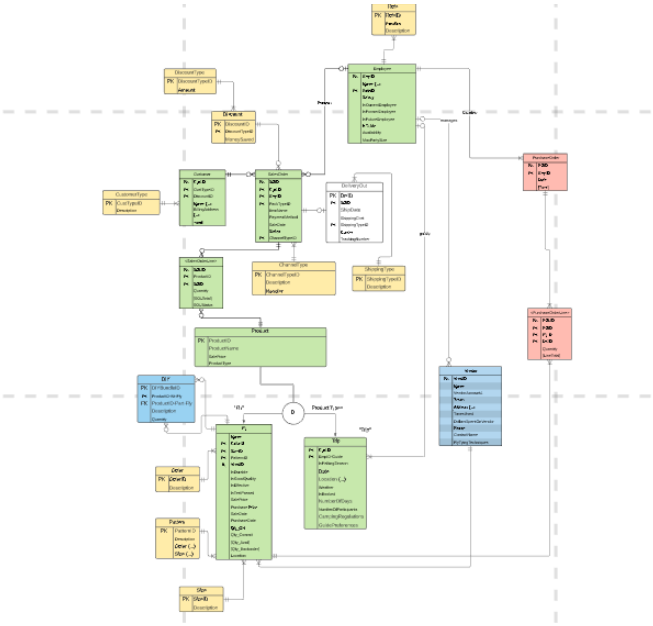
Denormalization is used to add data to one or more tables at one time. It helps users to ensure that their necessary data is entered and helps to efficiently add data to multiple tables in one statement, instead of having to enter the same data information multiple times. In this Elysian Fly Company Project, Team Mozart did not do much denormalization, because most of our tables did not pass the tests that are required before tables can go through the denormalization process. Another reason that Team Mozart did not use much denormalization is because currently, this is the primary database for Elysian Fly Company, and denormalization is typically used in the secondary database. For example, instead of adding Pattern to the TFly table, we preferred making it its own table. For a table to be denormalized, it must show two things: the table is referenced by only one table & one attribute of the table is used 90% of the

time. This is not the case for out TPattern table for example and that is why we did not denormalize it. However, we did add certain attributes to more than one table.

Implemented Physical Design

We came up with this diagram after implementing all our tables. It looks very similar to our ERD (see below).





Challenges Faced/Addressed During Implementation

One of the main challenges that Team Mozart had while creating the database was implementing the data into the tables. Using the data that Elysian Fly Company provided was helpful but having to create and implement the random data created some problems. To overcome this, we worked together as a team and helped one another to create and enter the data. We also did research and found ways to insert the data randomly and through other methods. Another challenge that Team Mozart faced was creating queries for Elysian Fly Company. While having to create additional queries that we thought Elysian Fly Company would be interested in seeing, we found it writing the code for the query to be challenging. To overcome this, we referred to videos and the textbook, and worked together. Working as a team while creating the queries helped to ensure that we were correctly writing them. Our last challenge that we faced would be creating the Data Dictionary. While very helpful when it is complete, the Data Dictionary can be difficult and time consuming to create. To overcome this, each team member created a Data Dictionary based on the tables they were assigned to create, and then we combined all of them. This helped because it lightened the workload on each member and helped each team member to gain experience creating a Data Dictionary. While we did have challenges, Team Mozart worked together to overcome them and do the best work that we could for Elysian Fly Company.

The challenges our team faced with creating new queries was the difficulty in knowing what the Elysian Fly Company specifically wanted out of the database and how to execute that need through our tables. In order to meet the needs of Elysian Fly Company we created queries that display the data from our ERD and logical design. Another challenge we faced was specifically implementing the queries to our database by creating three unique queries to our group for the Elysian Fly Company. We overcame this challenge by working as a group to think of queries that would benefit Elysian Fly Company in data that should be known and available to them. As a group we focused on areas that the customer was unaware of that they needed to be included into a database to make it as efficient and well-functioning to their needs and standards as a company. With that being said, our group included a multitude of tables and data that covers information dealing with their customer, product, and employees in order to create a well-rounded and efficient database. It

was hard to learn about all the complexities of SQL Server and areas dealing with the physical design of the database itself. We overcame this challenge by referencing lectures and notes, along with practicing SQL Server functions to become more acquainted.

Strengths and Weaknesses Encountered During Implementation

One of Team Mozart's strengths throughout this project has been our capability to get tasks completed, despite many obstacles being in the way. With this year looking so different, there were many challenges that got in the way of this project, but Team Mozart worked very hard to overcome those challenges and complete the project. Lam Nguyen, one of Team Mozart's members is currently in another time zone, and still proved to always be helpful and available no matter what. Having to meet primarily virtually and communicate through email, it was often hard to keep everything organized, but Team Mozart worked tirelessly together and overcame anything that was in the way. One of Team Mozart's weaknesses throughout this project was how different this past semester has looked. With the inability to do much in person, we had to find other ways to communicate and work on the project, but Team Mozart took full advantage of our resources and completed the project.

Specific SQL Statements Requested

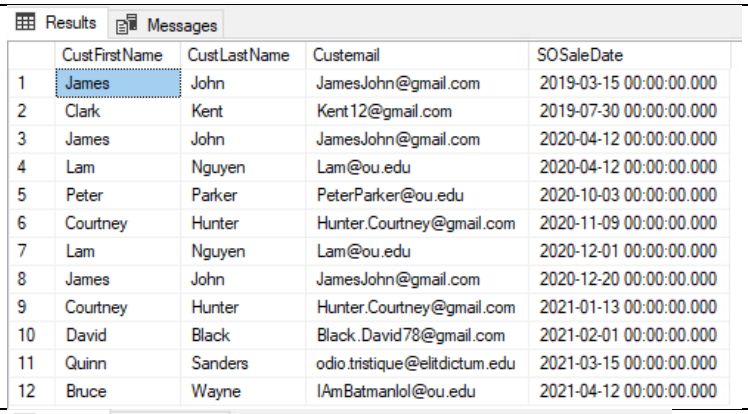
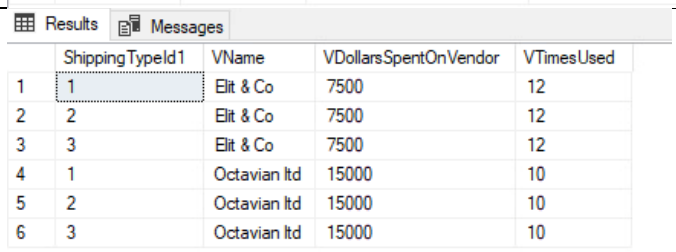
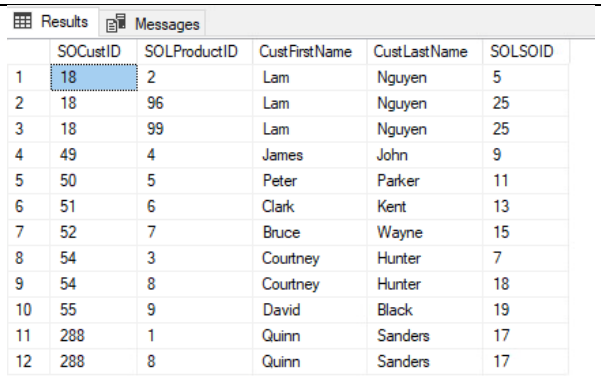
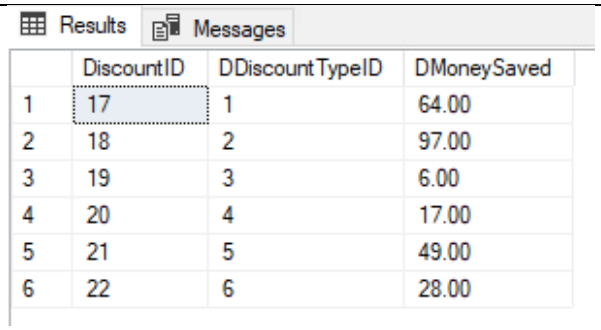
Below are the queries that were requested by Elysian Fly.

Query #	Question	SQL	Partial Output
01	Total Sales (in dollars) by customer state per year (e.g., total sales for all customers from Montana, Wyoming, Colorado, etc.)	**SELECT** StateName, Year(SOSaleDate) as SaleDate, COUNT (SOLID) AS TotalSales **FROM** TSalesOrderLine TSOL Join TSalesOrder TSO on TSOL.SOLID = TSO.SOID JOIN TCustomer AS TC ON TSO.SOCustID = TC.CustomerID JOIN TState AS TS ON TZC.ZStateID=TS.StateID **WHERE** (TS.StateName IN('MT', 'MN') **GROUP BY** StateName, Year(SOSaleDate) **ORDER BY** Total Sales;	Results Messages StateName SaleDate TotalSales 1 MT 2019 1 2 MN 2020 1 3 MT 2020 1
02	Total sales (in dollars) by vendor per year. We must be able to calculate profit (sale price – purchase price).	**SELECT** year(SOSaleDate) as SaleDate, Count(SOLID) as TotalSales, VendorID, SUM(FlySalesPrice - FlyPurchaseCost) as Profit **From** TSalesOrder TS join TSalesOrderLine TSOL on TS.SOID = TSOL.SOLID join TProduct TP on TSOL.SOLProductID = TP.ProductID Join TFly TF on TP.ProductID = TF.FlyProductID Join TVendor TV on TF.FlyVendID = TV.VendorID	Results Messages SaleDate TotalSales VendorID Profit 1 2020 1 1 5 2 2019 1 3 47 3 2020 1 6 0 4 2020 1 7 5

		GROUP BY year(SOSaleDate), VendorID;	
03	The ten highest selling (in dollars) (a) patterns, (b) sizes, (c) pattern-size-color combinations in a given year.	**SELECT** top 10 FlyProductID, FlyPattern, Count(SOLID) as TotalSales, year(SOSaleDate) as SaleDate **FROM** TSalesOrder TS Join TSalesOrderLine TSOL on TS.SOID = TSOL.SOLSOID Join TProduct TP on TSOL.SOLProductID = TP.ProductID Join TFly TF on TP.ProductID = TF.FlyProductID **GROUP BY** FlyProductID, FlyPattern, year(SOSaleDate) **ORDER BY** TotalSales desc, year(SOSaleDate) desc;	Results Messages FlyProductID | FlyPattern | TotalSales | SaleDate 1 | 9 | 6 | 1 | 2021 2 | 8 | 10 | 1 | 2021 3 | 18 | 182 | 1 | 2021 4 | 17 | 111 | 1 | 2021 5 | 1 | 1 | 1 | 2021 6 | 2 | 2 | 1 | 2020 7 | 16 | 102 | 1 | 2020 8 | 15 | 143 | 1 | 2020 9 | 6 | 101 | 1 | 2019 10 | 4 | 4 | 1 | 2019
		SELECT top 10 FlyProductID, FlySizeID, Count(SOLID) as TotalSales, year(SOSaleDate) as SaleDate **FROM** TSalesOrder TS Join TSalesOrderLine TSOL on TS.SOID = TSOL.SOLSOID Join TProduct TP on TSOL.SOLProductID = TP.ProductID Join TFly TF on TP.ProductID = TF.FlyProductID **GROUP BY** FlyProductID, FlySizeID, year(SOSaleDate) **ORDER BY** TotalSales desc;	Results Messages FlyProductID | FlySizeID | TotalSales | SaleDate 1 | 18 | 1 | 1 | 2021 2 | 17 | 24 | 1 | 2021 3 | 9 | 17 | 1 | 2021 4 | 8 | 16 | 1 | 2021 5 | 1 | 2 | 1 | 2021 6 | 16 | 23 | 1 | 2020 7 | 15 | 22 | 1 | 2020 8 | 2 | 3 | 1 | 2020 9 | 6 | 14 | 1 | 2019 10 | 4 | 12 | 1 | 2019
		SELECT top 10 FlyProductID, FlyPattern, FlySizeID, FlyColorID, Count(SOLID) as TotalSales, year(SOSaleDate) as SaleDate) **FROM** TSalesOrder TS Join TSalesOrderLine TSOL on TS.SOID = TSOL.SOLSOID Join TProduct TP on TSOL.SOLProductID = TP.ProductID Join TFly TF on TP.ProductID = TF.FlyProductID **GROUP BY** FlyProductID, FlyPattern, FlySizeID, FlyColorID, year(SOSaleDate) **ORDER BY** TotalSales desc;	Results Messages FlyProductID | FlyPattern | FlySizeID | FlyColorID | TotalSa 1 | 18 | 182 | 1 | 17 | 1 2 | 17 | 111 | 24 | 16 | 1 3 | 9 | 6 | 17 | 9 | 1 4 | 8 | 10 | 16 | 8 | 1 5 | 1 | 1 | 2 | 1 | 1 6 | 16 | 102 | 23 | 15 | 1 7 | 15 | 143 | 22 | 14 | 1 8 | 2 | 2 | 3 | 2 | 1 9 | 6 | 101 | 14 | 6 | 1 10 | 4 | 4 | 12 | 4 | 1

04	The number of times each product (fly) was sold. We want to see also those flies that have never been sold so that we can discontinue them.	**SELECT** top 22 FlyProductID, Count(SOLID) as TotalSales **FROM** TSalesOrderLine TSOL full Join TProduct TP On TSOL.SOLProductID = TP.ProductID Join TFly TF on TP.ProductID = TF.FlyProductID **GROUP BY** FlyProductID **ORDER BY** TotalSales desc;	Results Messages FlyProductID TotalSales 1 8 2 2 9 1 3 7 1 4 6 1 5 5 1 6 4 1 7 3 1 8 2 1 9 1 1 10 22 0 11 21 0 12 20 0
05	Total sales (in dollars) for each channel per month.	**SELECT** month(SOSaleDate) as SaleMonth, Count(SOLID) as TotalSales, ChanDescription **FROM**TSalesOrder TS join TSalesOrderLine TSOL ON TS.SOID = TSOL.SOLSOID Join TChannelType TCT on TS.SOChannelTypeID = TCT.ChannelTypeID **GROUP BY** month(SOSaleDate), ChanDescription;	Results Messages SaleMonth TotalSales ChanDescription 1 4 1 By Phone 2 10 1 By Phone 3 1 1 In-Person 4 3 2 In-Person 5 11 1 In-Person 6 2 1 Online 7 3 1 Online 8 4 1 Online 9 7 1 Online
06	10% of the products that have the highest margin.	**SELECT** top 10(FlySalesPrice - FlyPurchaseCost) as profit, FlyproductID, FlyName, VName **FROM** TProduct TP join TFly TF on TP.ProductID = TF.FlyProductID join TVendor TV on TF.FlyVendID = TV.VendorID **ORDER BY** profit desc;	Results Messages profit FlyproductID FlyName VName 1 78 10 FlyJ Felis Purus Ac Ltd 2 50 9 FlyI Dave & Sons 3 47 8 FlyH Elit & Co 4 43 6 FlyF Sem Nulla Ltd 5 39 21 FlyT Sem Nulla Ltd 6 10 2 FlyB Sem Nulla Ltd 7 10 3 FlyC Octavian ltd 8 5 4 FlyD Dave & Sons 9 5 5 FlyE Felis Purus Ac Ltd 10 5 1 FlyA Felis Purus Ac Ltd
07	The ten most popular (units sold) DIY fly-tying materials.	**SELECT** FlyName, count(SOLID) as TotalSales **FROM** TSalesOrder TSO join TSalesOrderLine TSOL on TSO.SOID = TSOL.SOLSOID Join TProduct TP on TSOL.SOLProductID = TP.ProductID Join TFly TF on TP.ProductID =	Results Messages FlyName TotalSales *No data found for this query

		TF.FlyProductID **WHERE** ProductType = 'bundle' **GROUP BY** FlyName;	
08	The number of distinct products managed by each vendor manager.	**Select** Distinct EmpId, EmpFirstName, EmpLastName, COUNT(TProd.ProductID) AS ProductID **From** TVendor TVend JOIN TZipCode TZip ON TVend.VZipCodeID= TZip.ZipCodeID JOIN TCustomer TCust ON TZip.ZipCodeID = TCust.CustZipCodeID JOIN TProduct TProd ON TCust.CustomerID = TProd.ProductID JOIN TFly TF ON TProd.ProductID = TF.FlyProductID JOIN TTrip TTri ON TProd.ProductID = TTri.ProductID JOIN TEmployee Temp ON TTri.TripGuideEmpID = Temp.EmpID **Group By** EmpID, EmpFirstName, EmpLastName **Order By** EmpFirstName	Results Messages EmpID | EmpFirstName | EmpLastName | ProductID 1 | 8 | Ryan | Smith | 1 2 | 12 | Sean | Thompson | 1 3 | 18 | Susan | Nice | 1
09	The upcoming, scheduled guided trips [i.e., the guided trips that have already been sold] for each guide, including the guide's name, the trip destination, the customer name, the number in the customer's party.	**Select** CustFirstName, CustLastName, EmpFirstName, EmpLastName, TripNumOfParticipants **From** TEmployee Temp JOIN TTrip TTri ON Temp.EmpID = TTri.TripProductID JOIN TProduct TProd ON TTri.ProductID = TProd.ProductID JOIN TSalesOrderLine TSOL ON TProd.ProductID = TSOL.SOLProductID JOIN TSalesOrder TSO ON TSOL.SOLID = TSO.SOID JOIN TCustomer TCust ON TSO.SOCustID = TCust.CustomerID **Order By** CustFirstName	Results Messages CustFirstName | CustLastName | EmpFirstName | EmpLastName | TripNumOfParticipants 1 | Courtney | Hunter | Tomma | Bambara | 5 2 | Courtney | Hunter | Jack | Ruark | 7 3 | James | John | Sean | Thompson | 10 4 | James | John | Laura | Maure | 10
10	Number of trips and the number of customers taken on fishing trips by each guide in the past 6 months.	**Select** Distinct TripNumOfParticipants, EmpFirstName, EmpLastName, TripCustID, TripDate **From** TEmployee TEmp JOIN TTrip ON TEmp.EmpID = TTri.TripProductID JOIN TCustomer TCust ON TTri.TripCustID = TCust.CustomerID JOIN TSalesOrder TSO ON TCust.CustomerID = TSO.SOCustID **Order By** TripDate	Results Messages TripNumOfParticipants | EmpFirstName | EmpLastName | TripCustID | TripDate 1 | 5 | Tomma | Bambara | 18 | 2020-04-14 2 | 6 | Sam | Ly | 49 | 2020-04-17 3 | 2 | Ryan | Smith | 50 | 2020-04-19 4 | 5 | Tony | Lan | 51 | 2020-04-21 5 | 7 | Jack | Ruark | 52 | 2020-04-24 6 | 5 | Katie | Wright | 54 | 2020-05-05 7 | 10 | Lucy | Smith | 55 | 2020-06-05

11	Names and email addresses of all customers who made purchases in a given month.	**Select** CustFirstName, CustLastName, Custemail, SOSaleDate **From** TCustomer TCust JION TSalesOrder TSO ON TCust.CustomerID = TSO.SOCustID **Order By** SOSaleDate	
12	Number of times used, and dollars spent on each shipping vendor and shipping type by vendor.	**Select** ShippintTypeId1, VName, VDollarsSpentOnVendor, VTimesUsed **From** TShippingType1 TShipTyp JOIN TDeliveryOut TDO ON TShipTyp.ShippingTypeId1 = TDO.DOShippingTypeID JOIN TSalesOrder TSO ON TDO.DOSOID = TSO.SOID JOIN TCustomer TCust ON TSO.SOCustID = TCust.CustomerID JOIN TZipCode TZip ON TCust.CustZipVodeID = TZip.ZipCodeID JOIN TVendor TVend ON TZip.ZipCodeID = TVend.VZipCodeID **Order By** VName	
13	Invoice lines for a given sales invoice number and given customer name.	**Select** SOCustID, SOLProductID, CustFirstName, CustLastName, SOLSOID **From** TCustomer TCust JOIN TSalesOrder TSO ON TCust.CustomerID = TSO.SOCustID JOIN TSalesOrderLine TSOL ON TSO.SOID = TSOL.SOLSOID JOIN TProduct TProd On TSOL.SOLProductId = TProd.ProductID **Order By** SOCustID	
14	A number of times a discount was applied to a sales order. List all the information about the discount, the total amount saved by customers that used the discount.	**Select** Distinct DiscountID, DDiscountTypeID, DMoneySaved **From** TDiscount TDis JOIN TSalesOrder TSO ON TDis.DicountID = TSO.SODiscountID JOIN TSalesOrderLine TSOL ON TSO.SOID = TSOL.SOLSOID JOIN TProduct TProd ON TSOL.SOLProductID = TProd.ProductID **Order By** DDiscountTypeID	

Results Messages

	CustFirstName	CustLastName	Custemail	SOSaleDate
1	James	John	JamesJohn@gmail.com	2019-03-15 00:00:00.000
2	Clark	Kent	Kent12@gmail.com	2019-07-30 00:00:00.000
3	James	John	JamesJohn@gmail.com	2020-04-12 00:00:00.000
4	Lam	Nguyen	Lam@ou.edu	2020-04-12 00:00:00.000
5	Peter	Parker	PeterParker@ou.edu	2020-10-03 00:00:00.000
6	Courtney	Hunter	Hunter.Courtney@gmail.com	2020-11-09 00:00:00.000
7	Lam	Nguyen	Lam@ou.edu	2020-12-01 00:00:00.000
8	James	John	JamesJohn@gmail.com	2020-12-20 00:00:00.000
9	Courtney	Hunter	Hunter.Courtney@gmail.com	2021-01-13 00:00:00.000
10	David	Black	Black.David78@gmail.com	2021-02-01 00:00:00.000
11	Quinn	Sanders	odio.tristique@elitdictum.edu	2021-03-15 00:00:00.000
12	Bruce	Wayne	IAmBatmanlol@ou.edu	2021-04-12 00:00:00.000

Results Messages

	ShippingTypeId1	VName	VDollarsSpentOnVendor	VTimesUsed
1	1	Elit & Co	7500	12
2	2	Elit & Co	7500	12
3	3	Elit & Co	7500	12
4	1	Octavian ltd	15000	10
5	2	Octavian ltd	15000	10
6	3	Octavian ltd	15000	10

Results Messages

	SOCustID	SOLProductID	CustFirstName	CustLastName	SOLSOID
1	18	2	Lam	Nguyen	5
2	18	96	Lam	Nguyen	25
3	18	99	Lam	Nguyen	25
4	49	4	James	John	9
5	50	5	Peter	Parker	11
6	51	6	Clark	Kent	13
7	52	7	Bruce	Wayne	15
8	54	3	Courtney	Hunter	7
9	54	8	Courtney	Hunter	18
10	55	9	David	Black	19
11	288	1	Quinn	Sanders	17
12	288	8	Quinn	Sanders	17

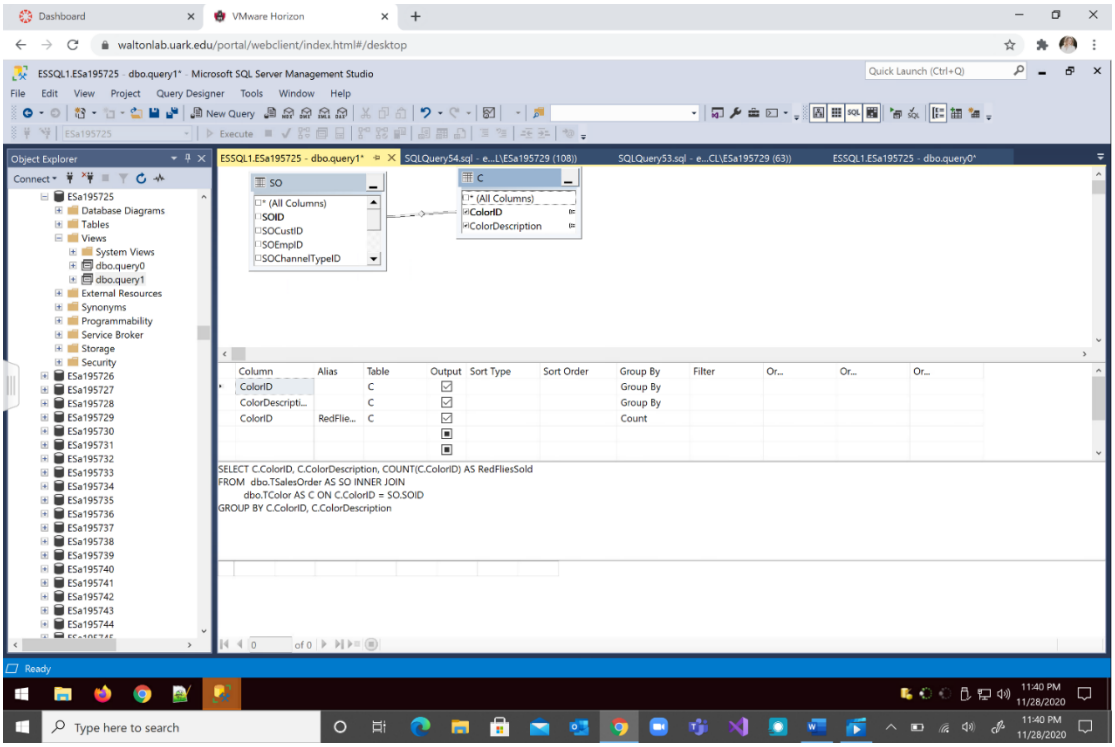
Results Messages

	DiscountID	DDiscountTypeID	DMoneySaved
1	17	1	64.00
2	18	2	97.00
3	19	3	6.00
4	20	4	17.00
5	21	5	49.00
6	22	6	28.00

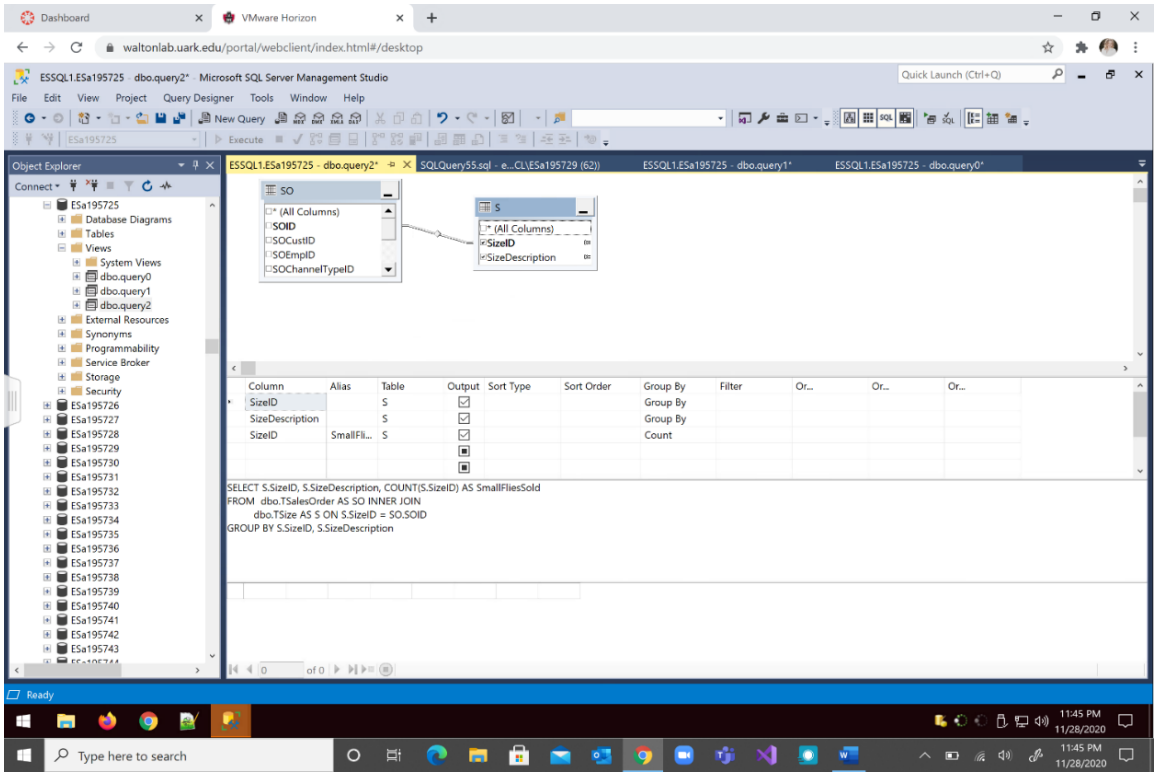
Three Additional Queries

Query Number	Question	Importance	SQL	Partial Output	Recap of Findings
1	How many red flies are sold?	This is important because Elysian Fly Company will be able to consider what color fly is most popular.	SELECT C.ColorID, C.ColorDescription, COUNT(C.ColorID) AS RedFliesSold FROM dbo.TSalesOrder AS SO INNER JOIN dbo.TColor as C ON C.ColorID = SO.SOID GROUP BY C.ColorID, C.ColorDescription	(See below on Query 1 Picture)	Only one Red Fly was sold.
2	How many small flies were sold?	Elysian Fly might need to know the number and percentage of each size fly that sells.	SELECT S.SizeID, S.SizeDescription, COUNT(S.SizeID) AS SmallFliesSold FROM dbo.TSalesOrder AS SO INNER JOIN dbo.TSize AS S ON S.SizeID = SO.SOID	(See below on Query 2 Picture)	22 Small Flies were sold.
3	Customer who is Local	By finding this information, Elysian Fly Company will be able to tell if more locals buy products than customers that are not local.	SELECT * FROM TCustomer TC JOIN TCustomerType TCT on TC.CustTypeID = TCT.CustTypeID WHERE CTDescription = 'Local'	(See below on Query 3 Picture)	There were many local customers.

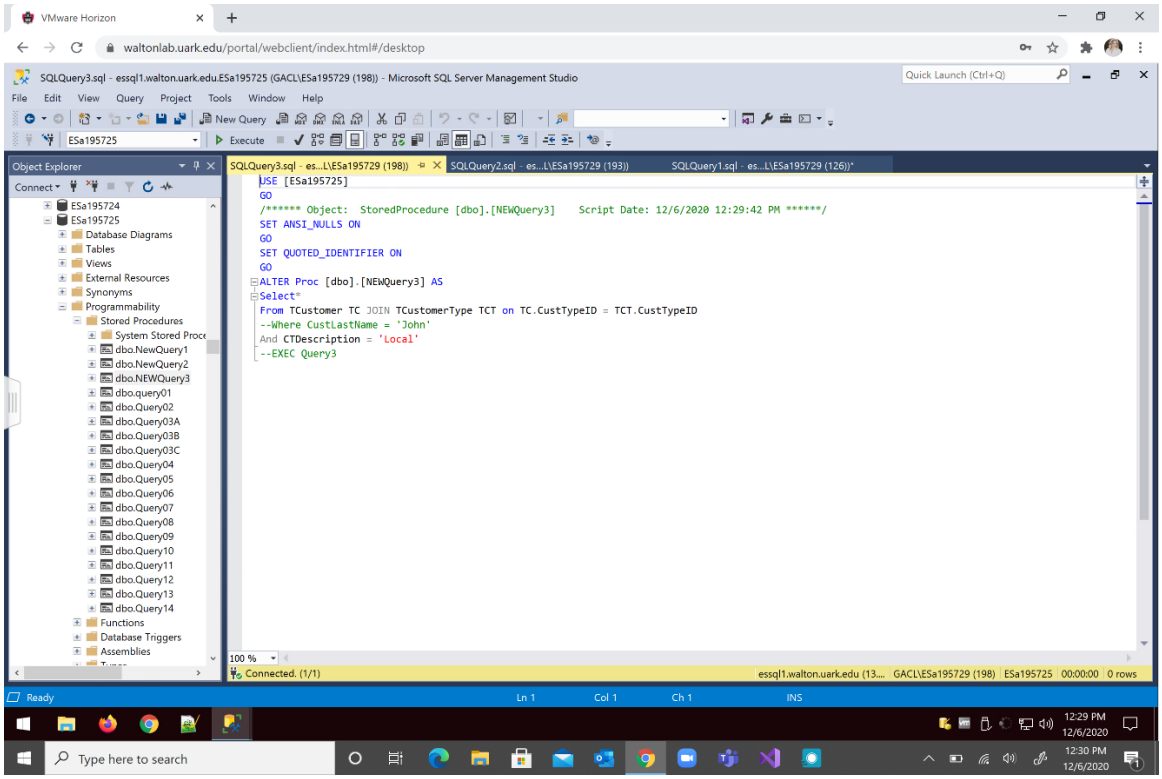
Query 1 Picture:



Query 2 Picture:



Query 3 Picture:



User Documentation

To use the database we created, please refer the following steps. We hope that it will ease the experience of our customer.

Step 1:

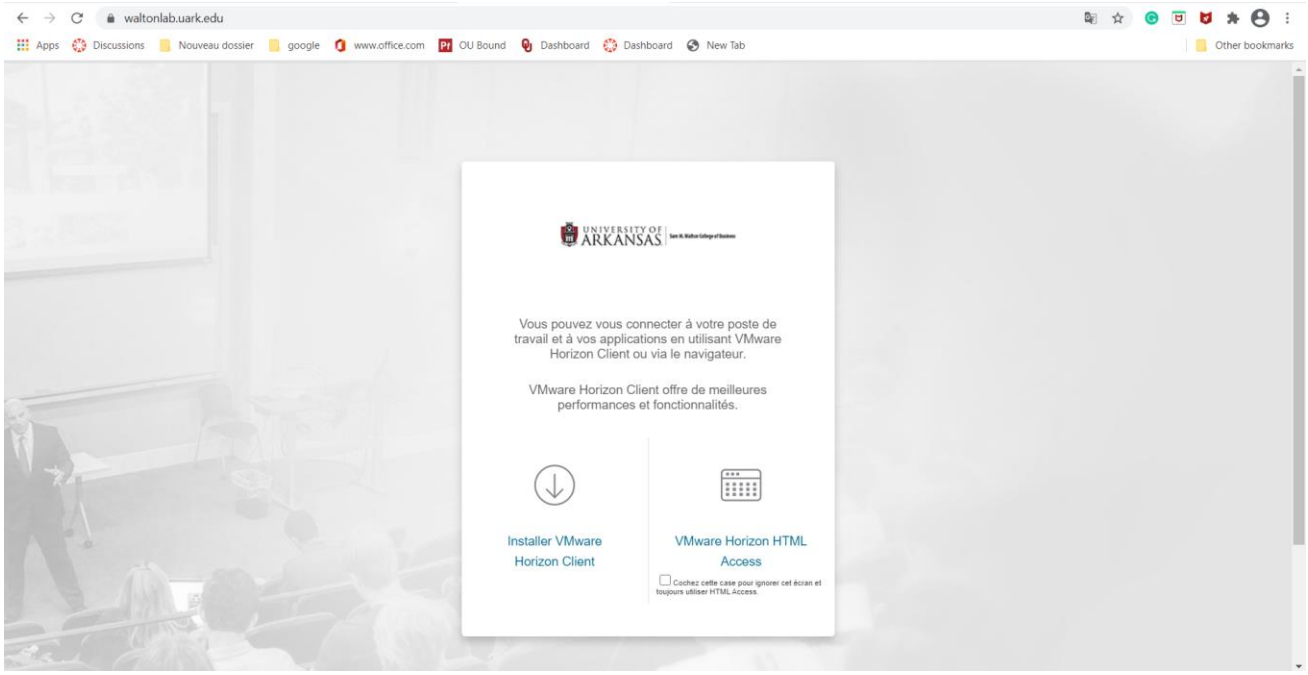
Log in to your computer.

Step 2:

Our database is implemented in a virtual environment offered to our team by the University of Arkansas. To access it, please click on the link below:

https://waltonlab.uark.edu/

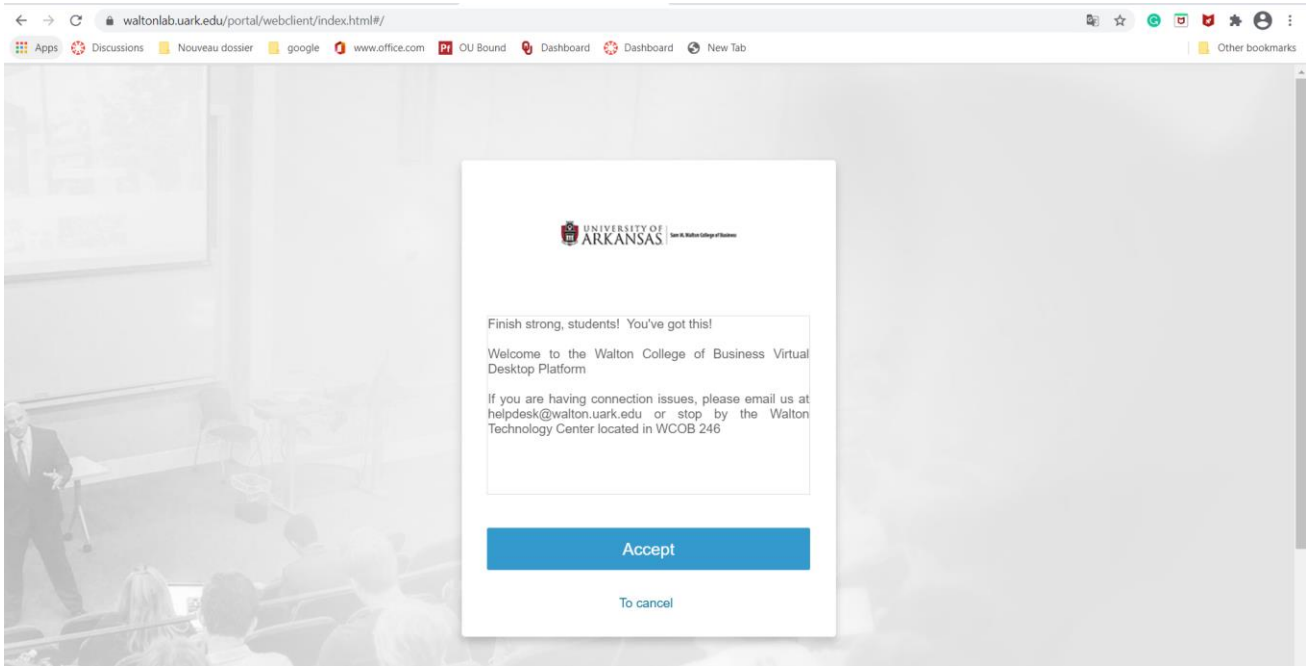
You should be directed to the following page.



Step 3:

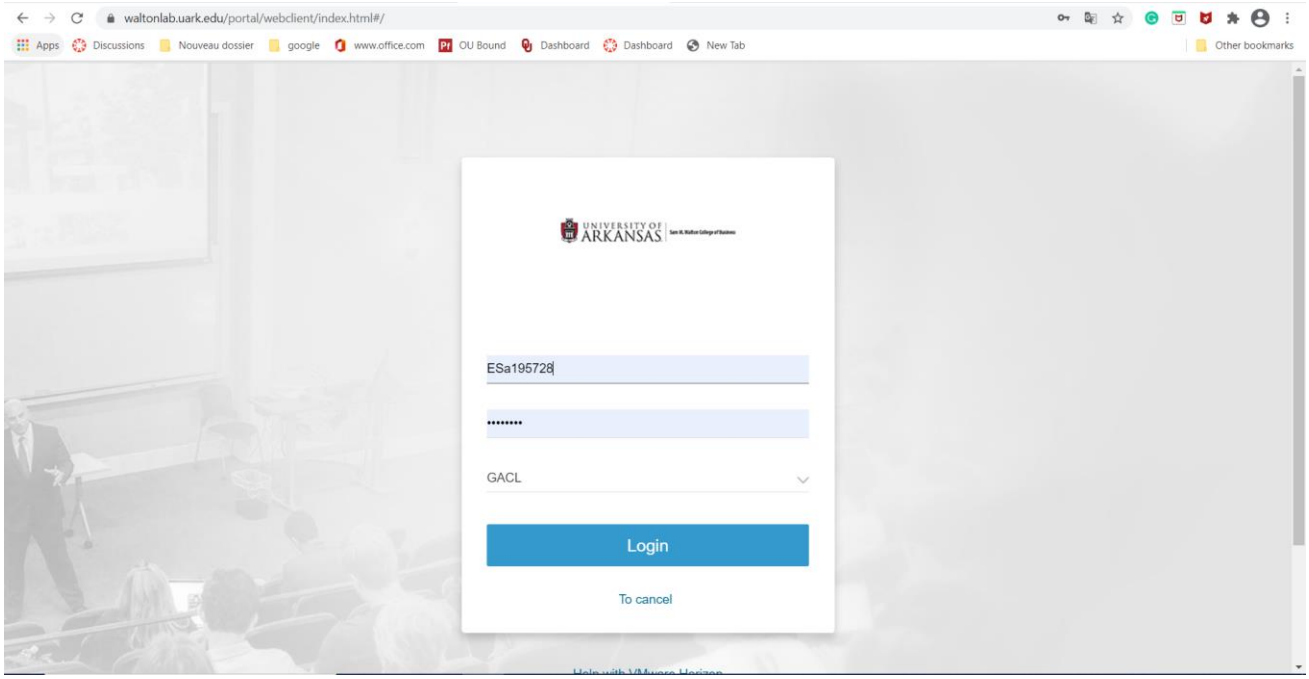
Click on **VMware Horizon HTML Access**.

You should be directed to the following page.



Click on **Accept**.

You should be directed to this page.



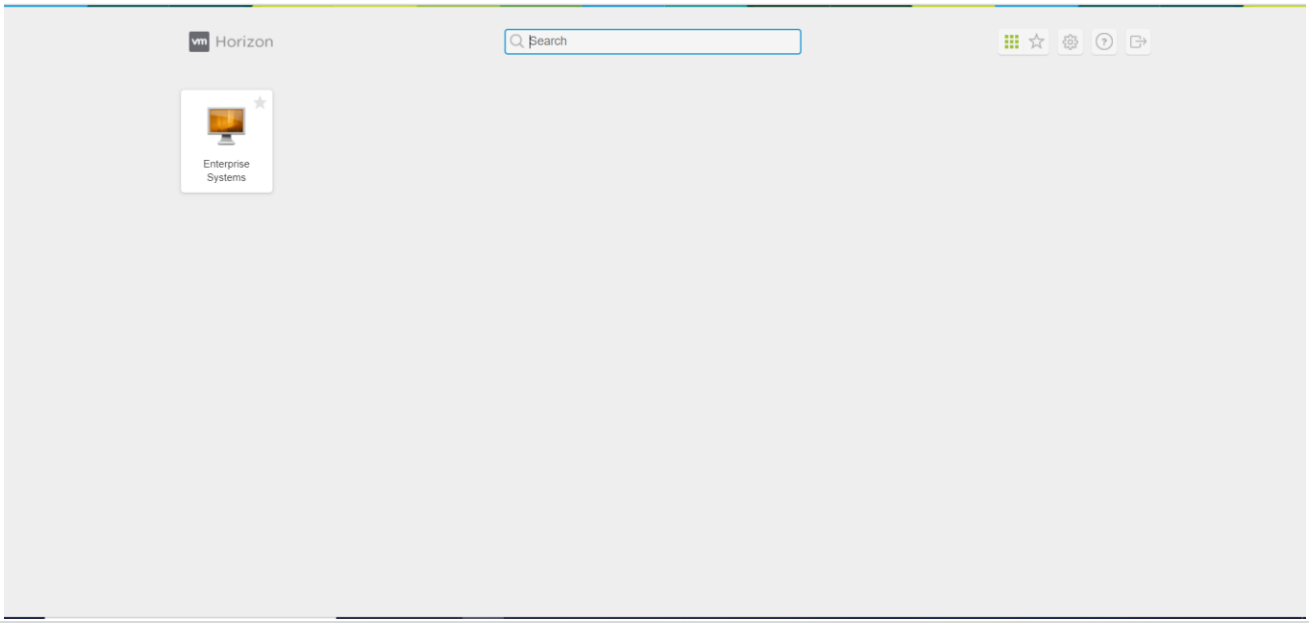
Step 4:

Enter the following:

Username: Esa195728
Password: RK96nsm$

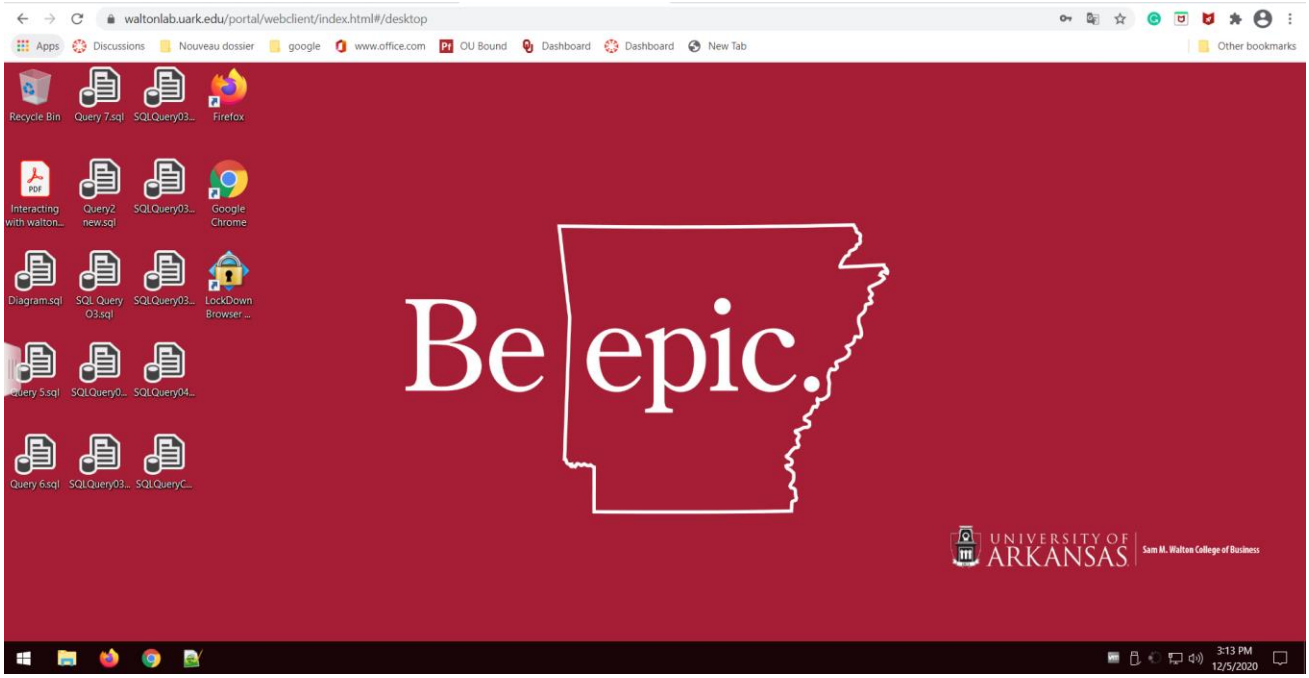
Then click on **Login**.

You should be directed to this page.



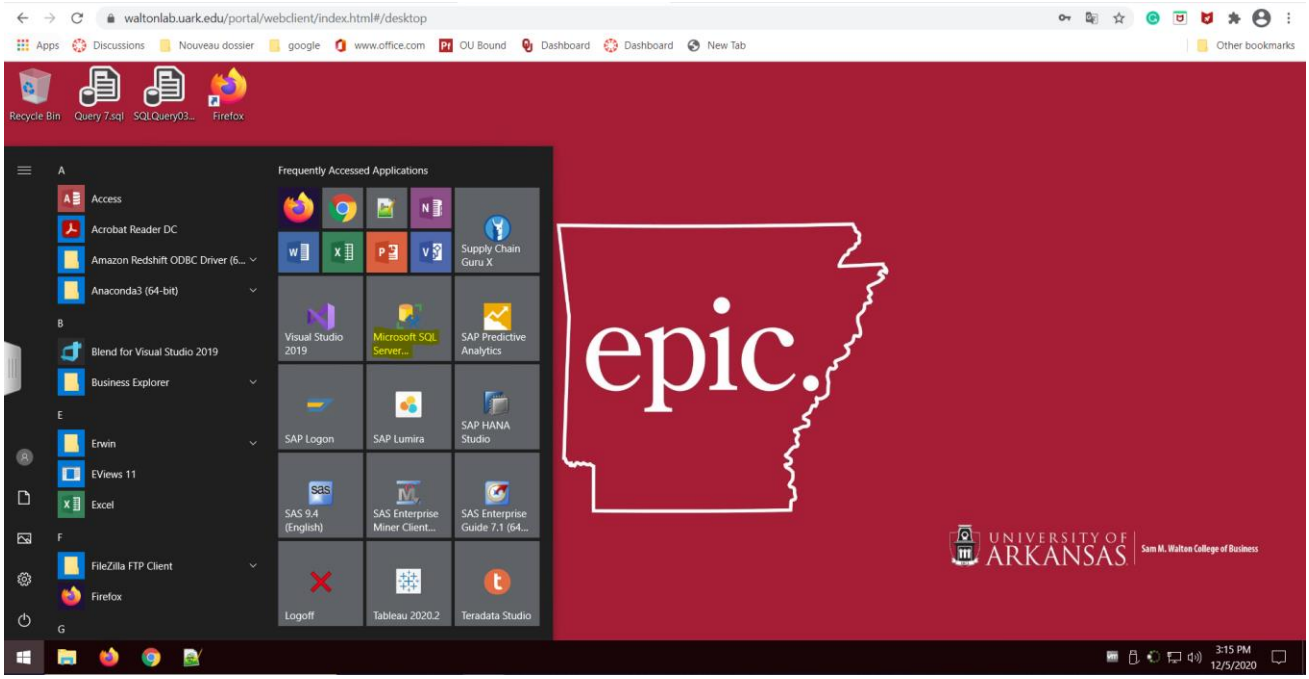
Step 5:

Click on **Enterprise Systems**. This will direct you to the windows virtual environment.



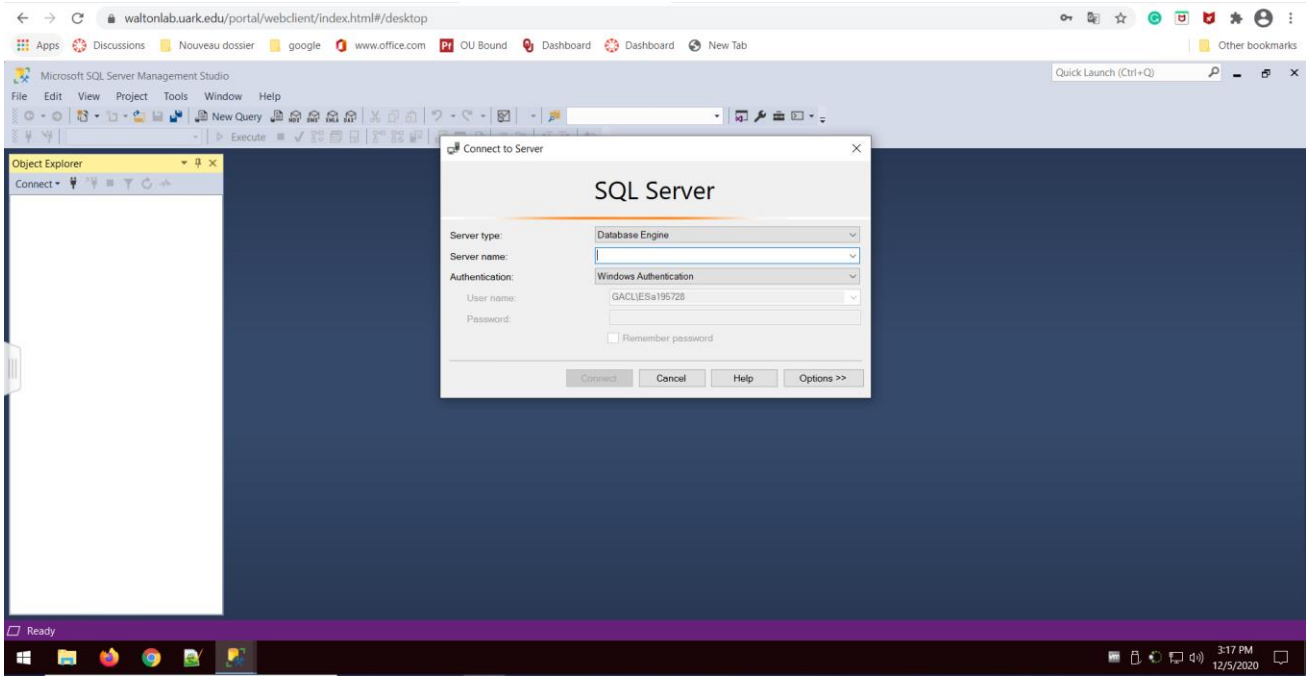
Step 6:

Click on **Start**.



Choose **Microsoft SQL Server** highlighted in yellow. This will open the Microsoft SQL Management studio.

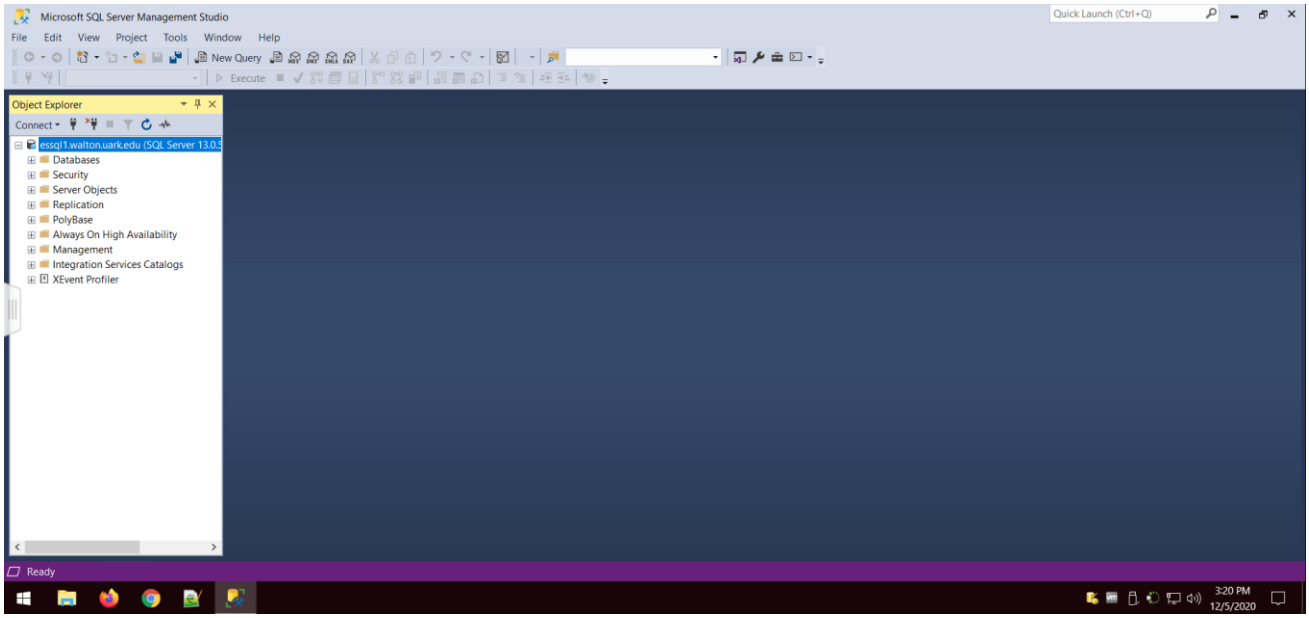
You should get the following tab.



To connect to the SQL server enter the following: **essql1.walton.uark.edu**

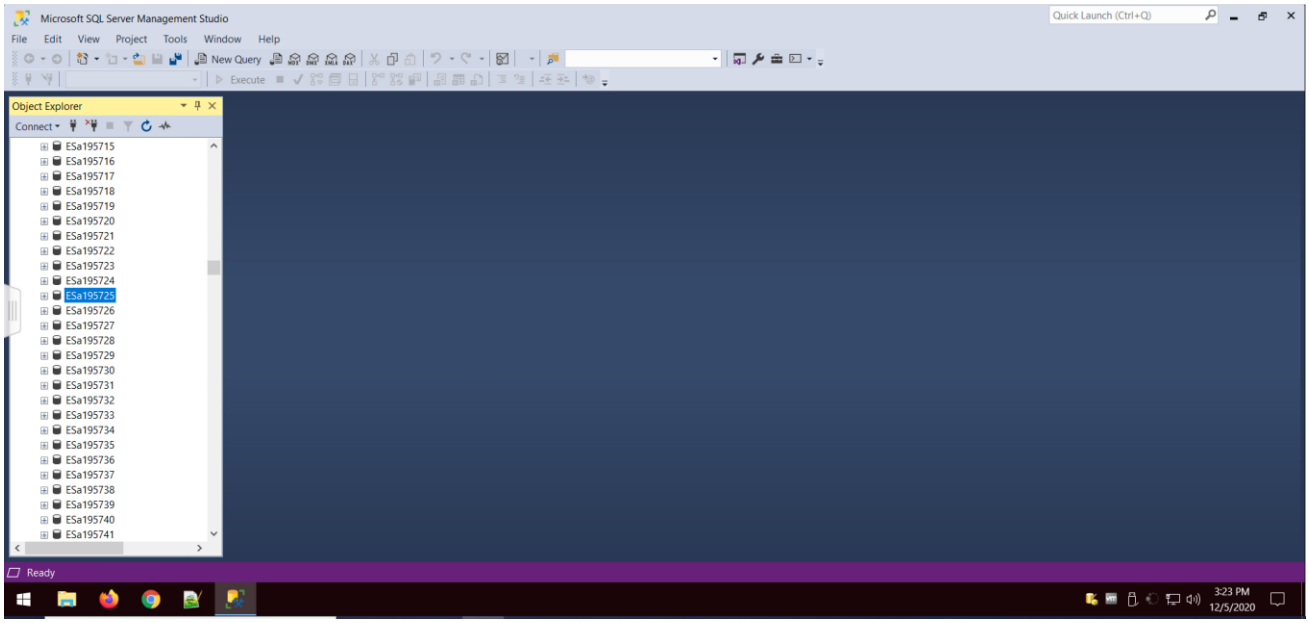
Then click on **connect**.

You should be directed to the page.

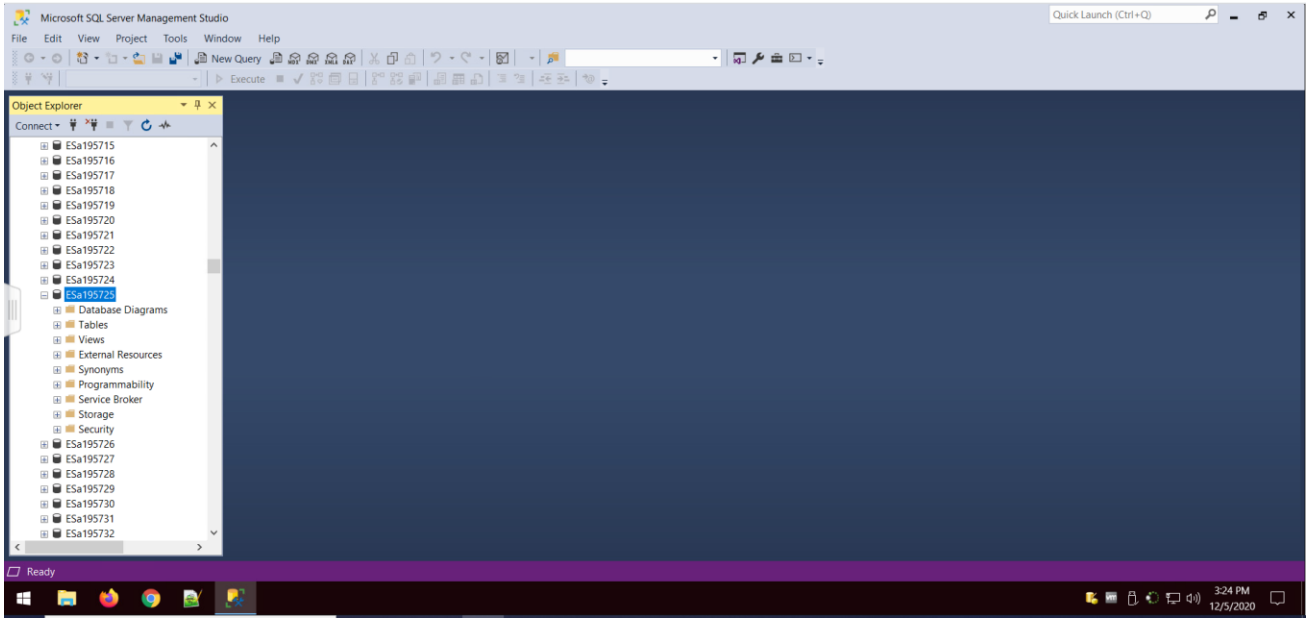


Step 7:

To open the database, click on the + sign next to Databases. This will open a list of databases that are stored in this server. Scroll down to find our Database (**Esa195725**).

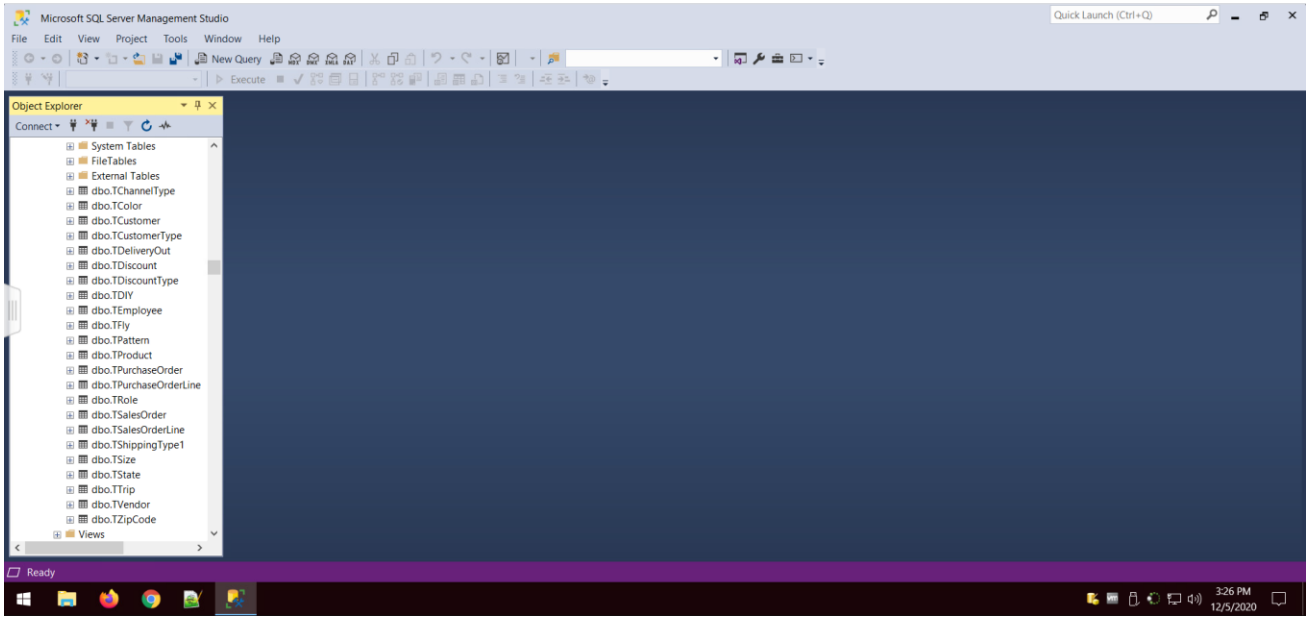


Click on the + sign next to it to expand.



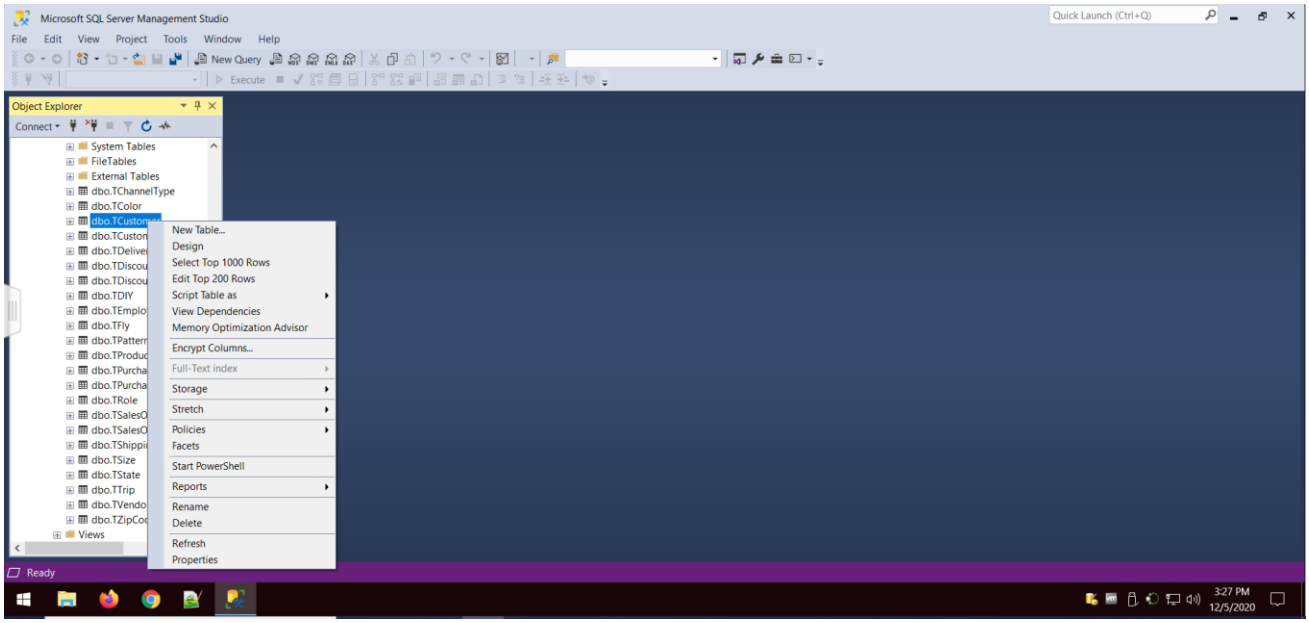
Step 8:

To view the tables that are implemented in this database, click on the + sign next to **Tables** to see the list of tables.

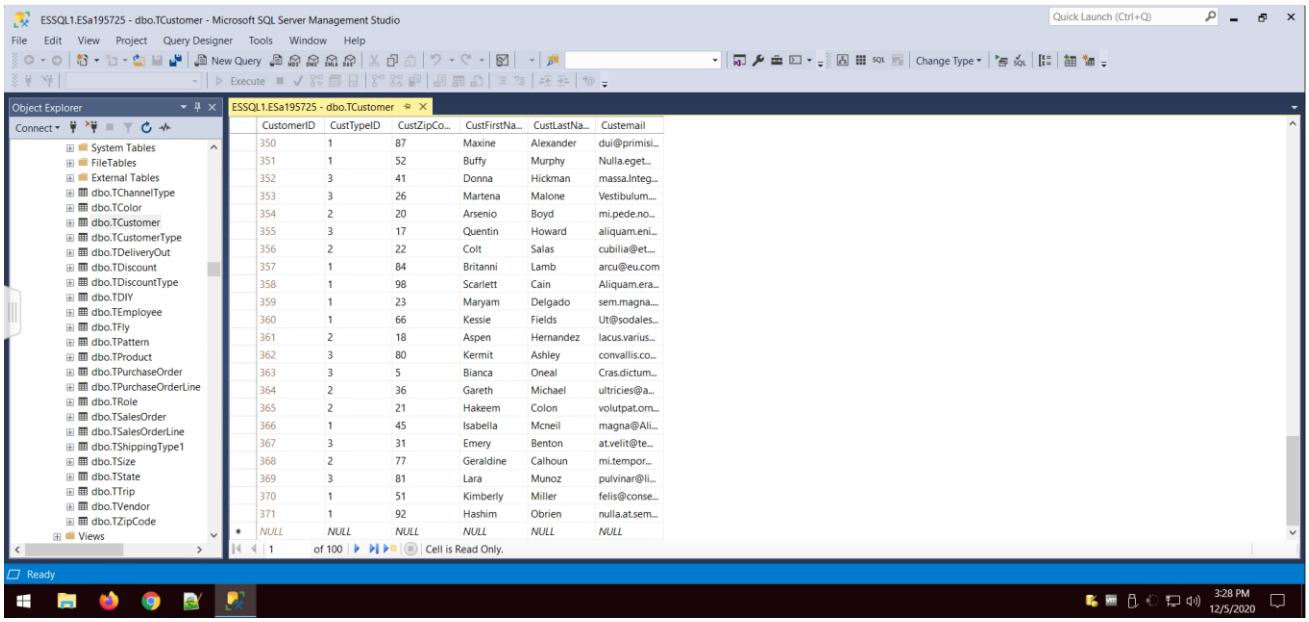


Step 9:

To edit a table, right click on it and choose Edit Top 200 rows.

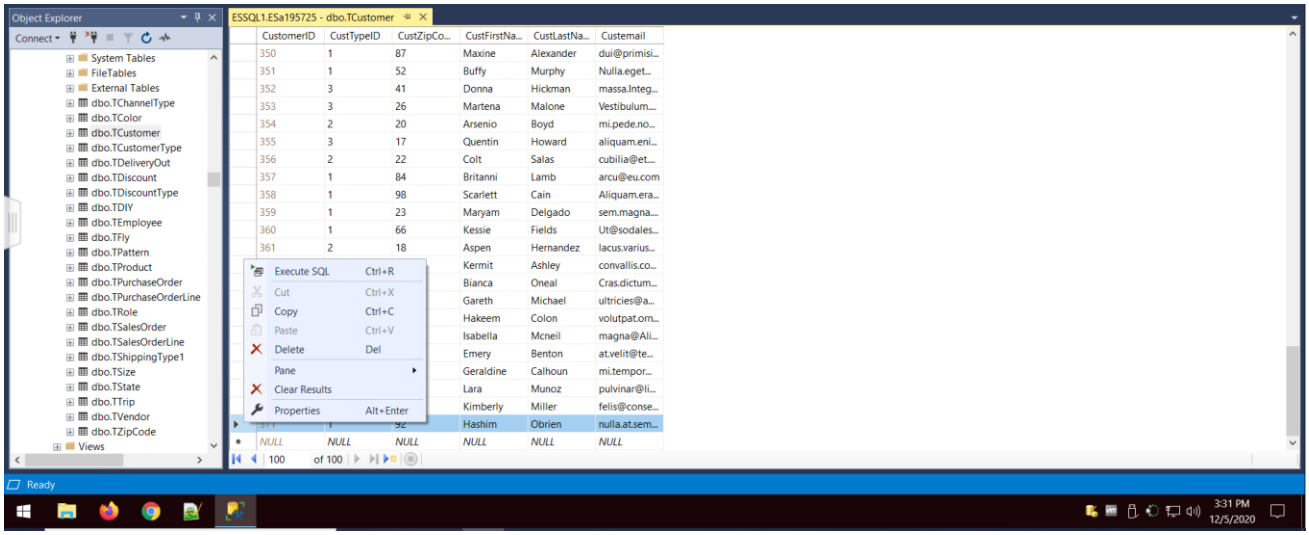


You should be directed to a page like this. Here you can enter data by clicking on the different cells and putting in data as you would in an excel file. If you want a new row, please make sure you enter all the data required for that row. Keep in mind that some data are not allowed to be null.



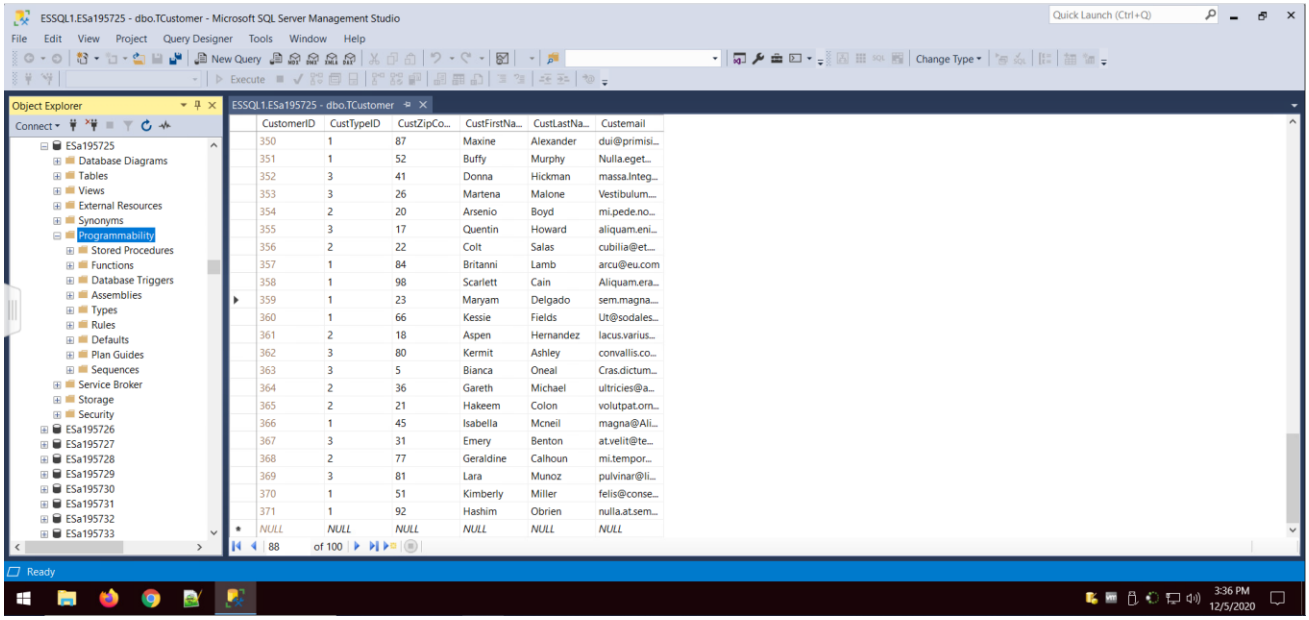
Note that IDs are auto incremented and therefore are **cell read only.

If you made a mistake and wish to delete a cell, just right click on it and choose delete.

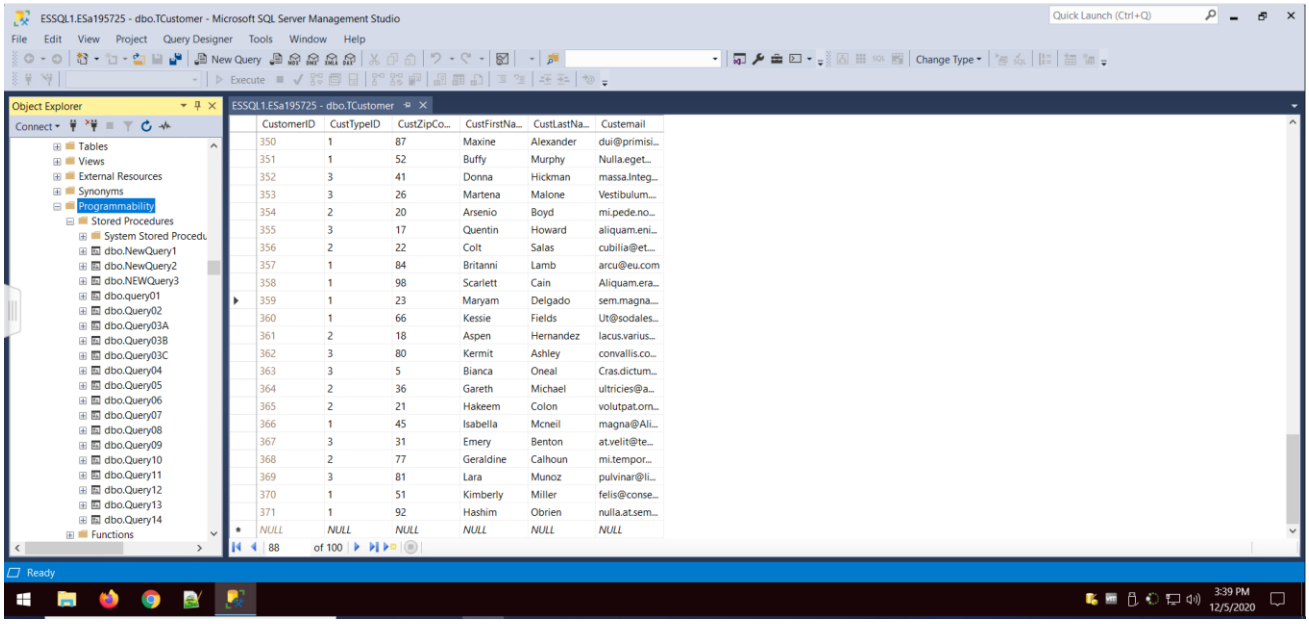


Step 10:

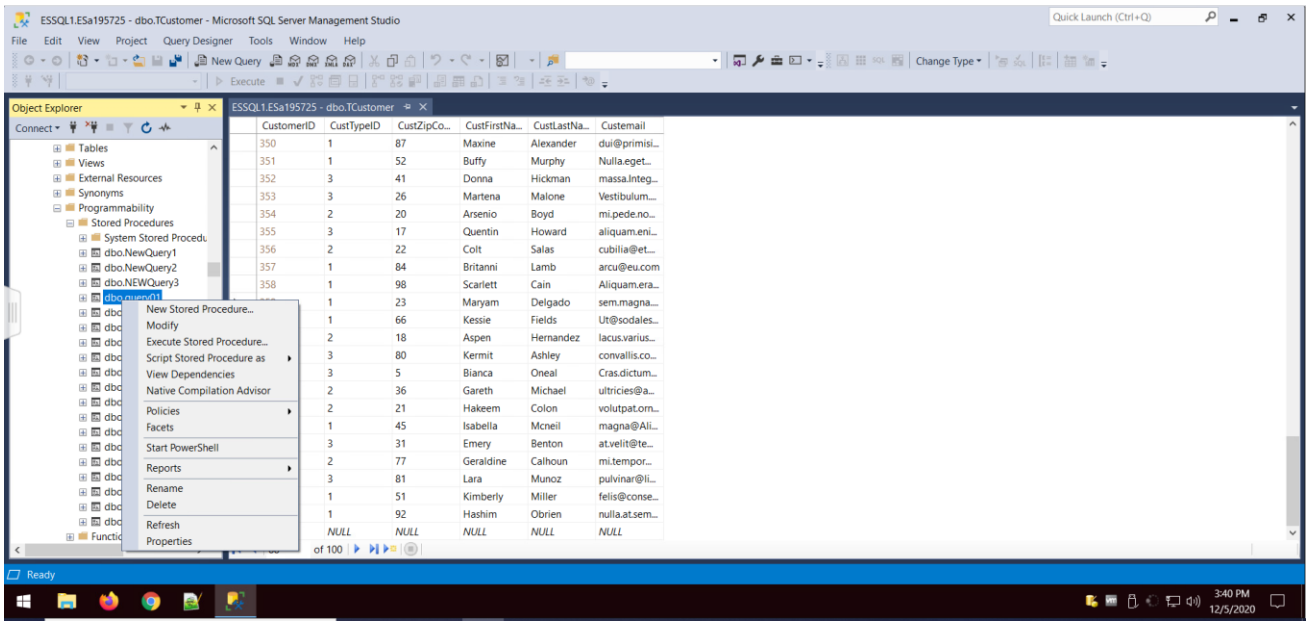
To run queries and get insights on your data, click on the + sign next to **Programmability** to expand it.



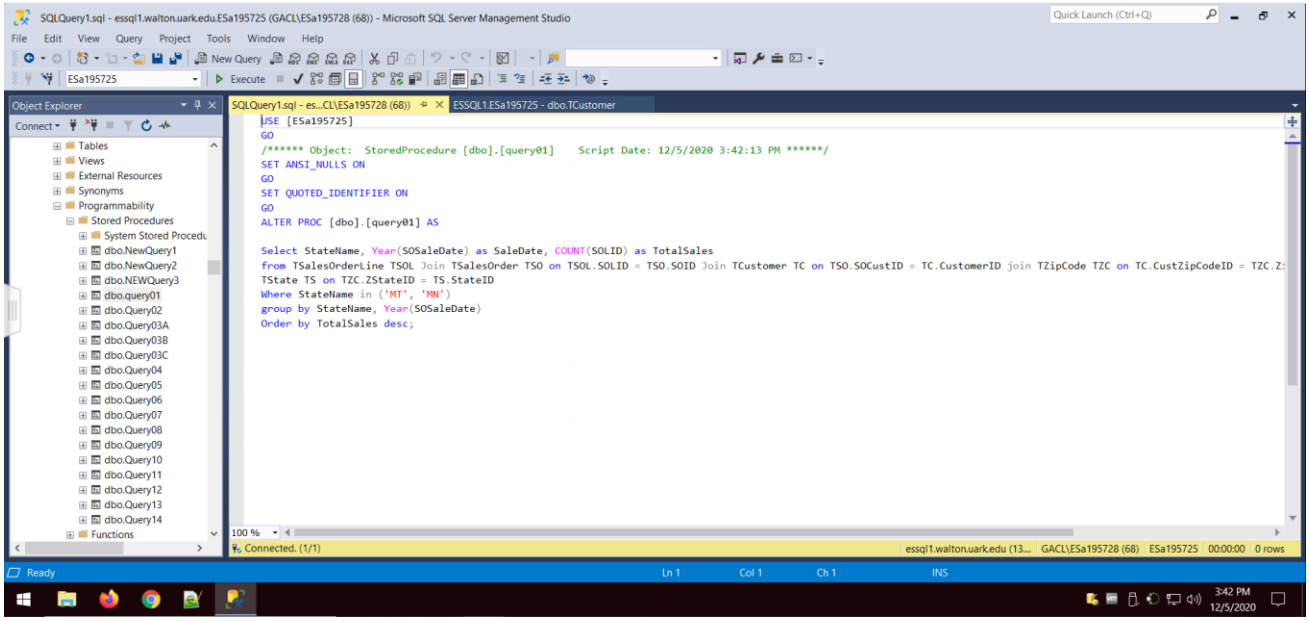
Then click on the + sign next the **Stored Procedures** to expand it. Here you will see a list of the queries that we have already made for based on Elysian Fly's requests.



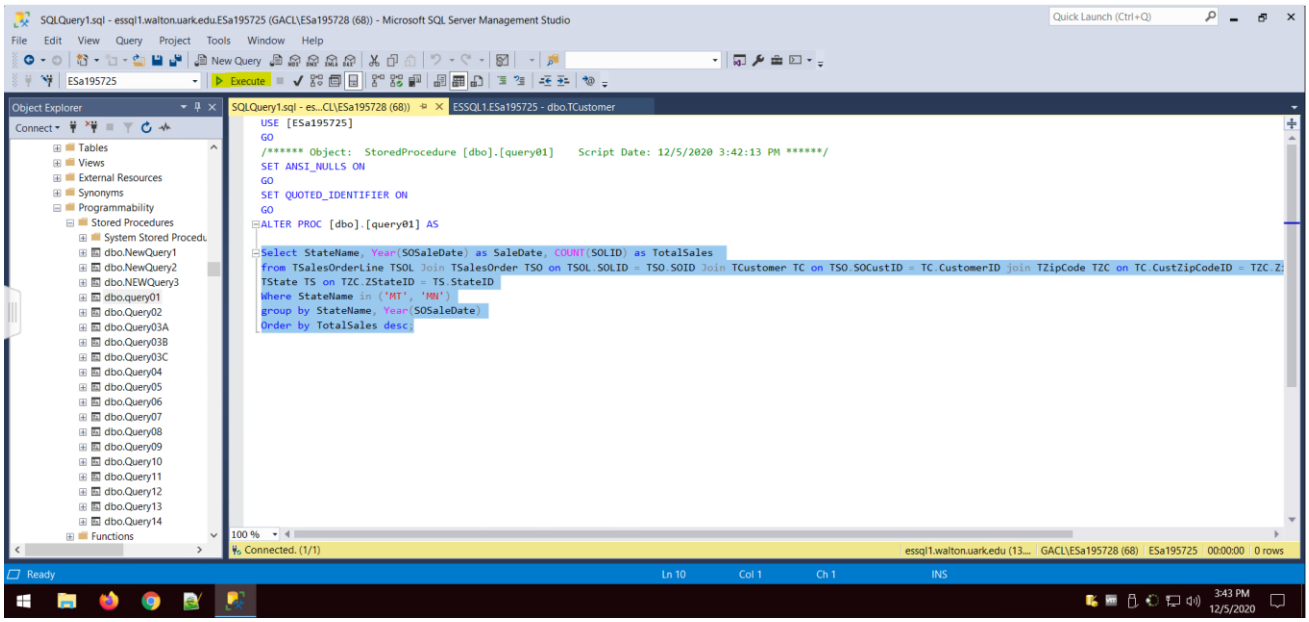
To make it easier for you, you can rename any of the queries. Right click on the query and choose **Rename**.



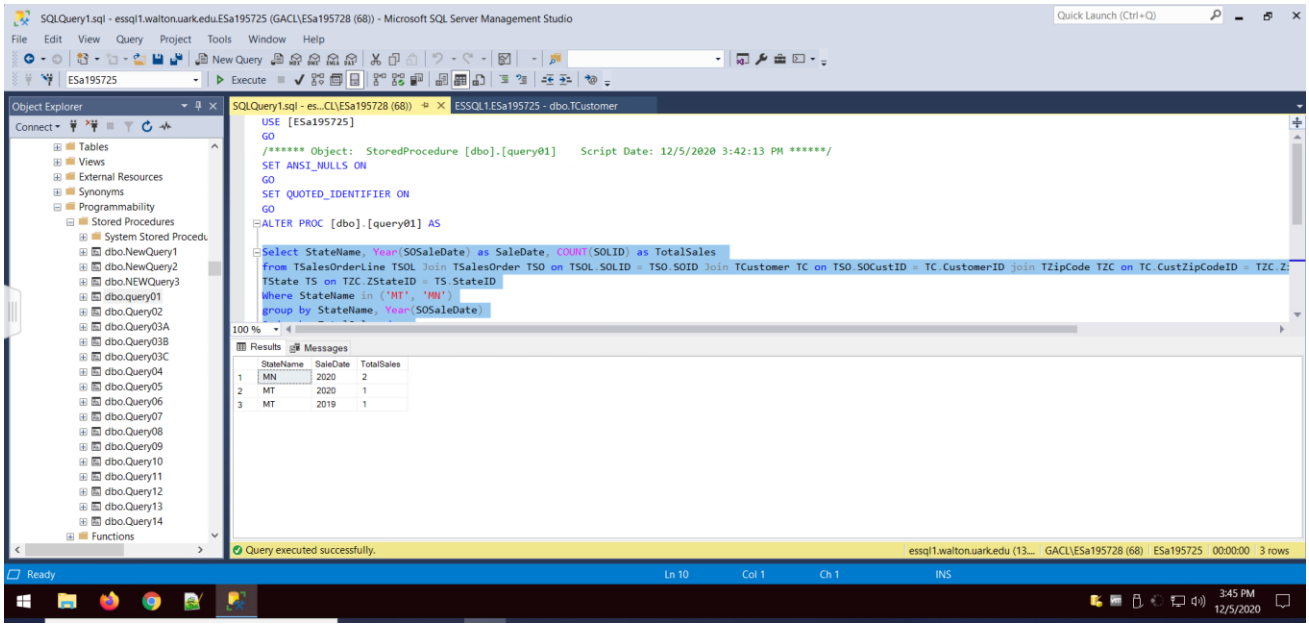
To run a query, you can choose **Modify** after right clicking on it. You should see a page like this.



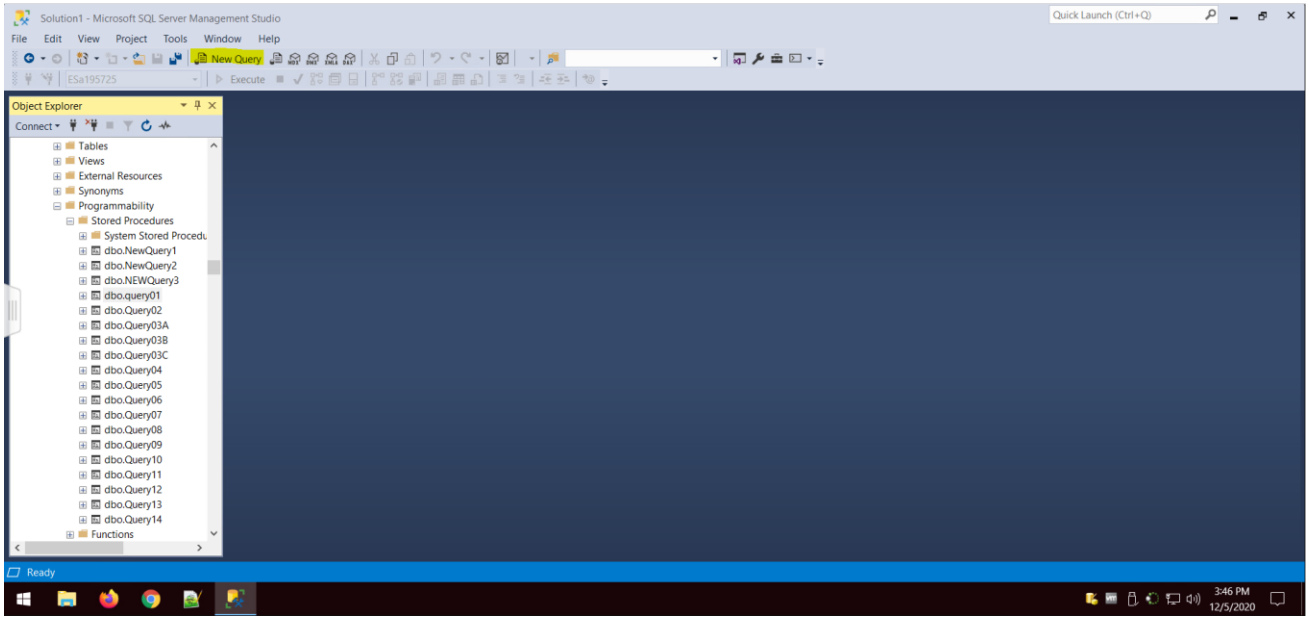
It has the code for that query. Select it then click on **Execute** which is highlighted in yellow.



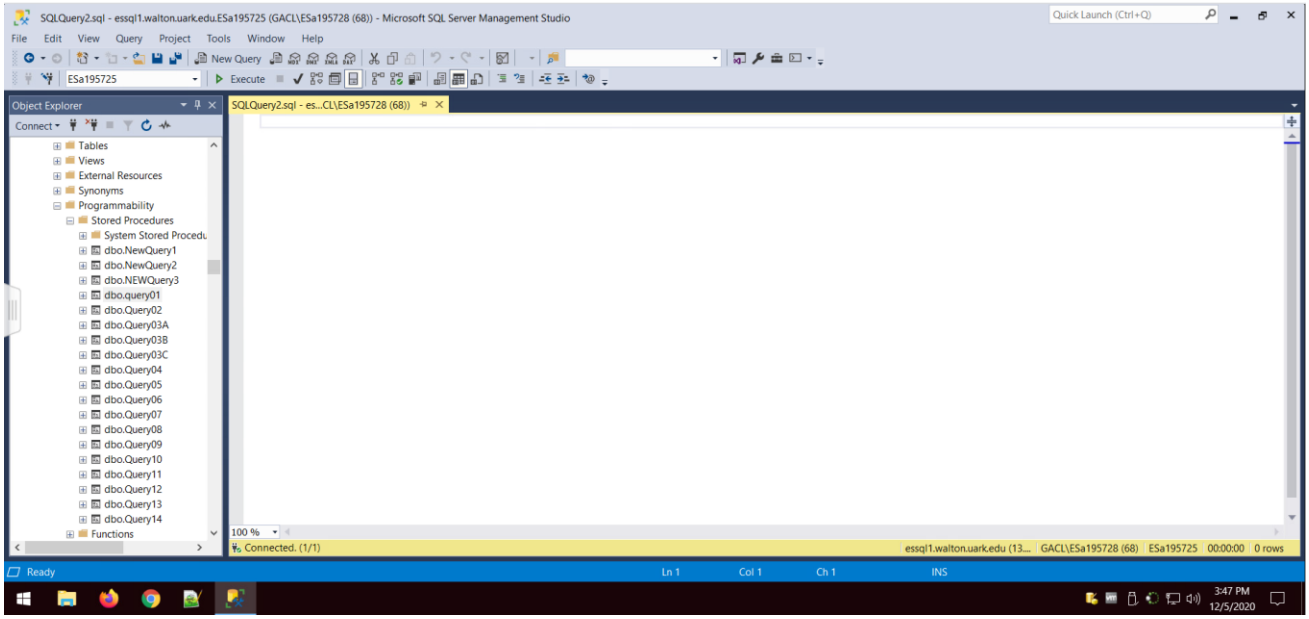
You should see the result of your query.



If you wish to make a new query, click on **New query** highlighted in yellow.



A new page will pop up for you to write your code.



If you wish to save your code as a procedure, make sure you include "**Create Proc *NameOfProcedure***" at the top of your code.

What We Learned Throughout This Process

Throughout this process, we had learned many new skills and gained new insight. We have worked together as a team, created a database, and done research for Elysian Fly Company in one semester. While there were challenges and obstacles, we preserved and did the best work that we could. Below is a statement from each team member of Team Mozart on what we all learned throughout this process.

- **Hillary** – Throughout this process, I have learned just how much work goes into creating a database. I have learned how important teamwork is and how necessary it is in a project like this. I have learned that many things in this field build on each other, and it is helpful to understand all topics before moving onto something new, such as the Milestones. I have really enjoyed this project and all of the knowledge that I have gained from it, and I look forward to using this knowledge later on.

- **Lam** – Through this project, I have been able to learn a lot about database construction and interaction. Although the sheer amount of work can be daunting, the learning curve is steep. This project allowed me to connect knowledges and skills from the beginning of the class to the end, from SQL coding to Physical Design. Furthermore, I had a great opportunity to collaborate with other team members, who without doubt, are one of the hardest working people I have ever met.

- **Sara** – Through this process, I have learned how to implement my knowledge about SQL, ERD, Physical Design, and Logical Design in order to create a functioning database. My favorite part from this project has to be creating the logical design and ERD. I really enjoyed working on this hard but rewarding project with my group members and having the ability to increase my understanding and knowledge on the steps and teamwork needed to create a

database for a company.

- **Sahrin** – Based on my experience that I have accumulated through this project; I now understand that building a database is a complicated yet simple task. Factors such as entities and understanding their relationships to one another is what makes this project lengthy and complex. However, if looked at from a broader angle, the task only has three simple steps that must be fulfilled before one can create their database. Through conceptual, logical, and physical design, a developer can notate the different factors that play into the relationships of the database and use that information to implement. I personally found the implementation phase the hardest due to it having numerous "mini" tasks within each task. For example, if I would like to create a table- I must also create a data dictionary. Overall, I would say my experience in building my first ever database was incredibly positive. Even though there were rough patches such as my team not being able to find a good time to meet that works for everyone, I managed to learn a lot from the project with their help. Learning the material through books and lecture is one thing, but hands on learning is another!

- **Khady** – Throughout this process I have learned about the work that is done behind databases. Before this project I knew how to retrieve data and always thought that the database that allowed me to do so must be complicated and complex. After doing this project, I know that creating a database is not as hard as it seems. I also got to work on it with other people and with the online setting it was not an easy task. Fortunately, we were able to challenge ourselves and come up with a database.

- **Team** – What we learned about throughout this project for Elysian Fly Company was the importance of efficient data and the importance of queries in executing specific functions in a database. We learned about what is necessary to make effective queries that display data to Elysian Fly Company. We also learned how to effectively use SQL Server; like creating tables and queries, and to deal with all the complexities of SQL Server. What we realized through this project was how SQL, ERD, Logical Design, and Physical Design are connected and all necessary parts in creating an effective database that our customer, Elysian Fly Company can implement in order to improve their business and collect specific information they need on areas within their company. We also learned how important is it to constantly update and revisit old milestones to improve our presentation and be able to effectively display all the information we have learned throughout this project. We were surprised about how much information can be stored in a database and how challenging creating effective and necessary queries are in accomplishing the mission of Elysian Fly Company.

- **Project Management** – Using the project management tool, we were able to track one another's progress to make sure that everyone was participating. We used it to list each team members contributions, so that everyone would get the correct amount of credit at the end of the project. The project management toll helped to keep all team members accountable and will be a useful tool for future projects.

Appendix

Team Contract

Team Mozart is a database design and development firm that offers a wide range of IT services to provide effective data management and storage. For more than 16 years, Mozart has been delivering top-notch curations of tailor-made databases and consultation for unique businesses all over the global community.

Team E - MOZART
Above and beyond

Team Member	Email	Phone	Strengths	Availability to Meet
Lam Nguyen	Lamnguyen99@ou.edu	(405) 361-6065	Hard-working	24/7 via Microsoft Teams and Zoom
Sara Mullins	sara.mullins@ou.edu	(816) 269-3743	Positive	24/7 before 1:00 pm
Hillary Neaves	hillaryn23@ou.edu	(405) 397-2850	Organized and Helpful	24/7 between 10:00am and 1:00pm
Khady Ndoye	Khady.Ndoye-1@ou.edu	(405) 795 - 6531	organized	24/7 via email
Sahrin Moytree	moytree@ou.edu	(405) 371-5243	Reliable, organized, and determined	24/7 via advanced scheduling

Team E, Mozart, explicitly hire individuals who are creative, hard-working, team players, organized, and most importantly harbor a positive outlook. The team member must display admirable qualities that complement the company's end goal.

The expectations for each team member must be met through the individual's work ethic. He or she must participate in every task allotted, must be willing to cooperate and ease the burden of tasks on other team members if needed, and must complete honest team evaluations as the end of the semester for each member

Data Dictionary Model

Table	PK?	Field Name	Data Type	Size	Null	Default	References	Sample
TState	Yes	StateID	Int (Auto)		Not Null	1		1
	No	StateName	Varchar	2	Not Null	1		OK
TZipCode	Yes	ZipCodeID	Int (Auto)	5	Not Null	1		1
	No	ZipCode	Varchar	10	Not Null			73072
	No	ZCity	Varchar	50	Not Null			Norman
	No	ZStateID	Int		Not Null		TState	1
TCustomerType	Yes	CustTypeID	Int (Auto)		Not Null	1		1
	No	CTDescription	Varchar	100	Not Null			One-Off Tourist
TDiscountType	Yes	DiscountTypeID	Int (Auto)		Not Null	1		1
	No	DTAmount	Decimal	(3,2)	Not Null			0.05 (10%)
TDiscount	Yes	DiscountID	Int (Auto)	1				1
	No	DDiscountTypeID	Int		Not Null		TDiscountType	1
	No	DMoneySaved	Decimal	(10,2)				1200.50
TSalesOrderLine	Yes	SOLID	Int (Auto)	1	Not Null			1
	No	SOLProductID	Int		Not Null		TProduct	1
	No	SOLSOID	Int		Not Null		TSalesOrder	1
	No	SOLQuantity	Int		Not Null			1
	No	SOLStatus	Varchar	50	Not Null			1
TColor	Yes	ColorID	Int (Auto)	1				1
	No	ColorDescription	Varchar	50	Not Null			Red
TTrip	Yes	TripProductID	Int (Auto)	1				1
	No	ProductID	Int		Not Null		TProduct	1
	No	TripCustID	Int		Not Null		TCustomer	1
	No	TripGuideEmpID	Int		Not Null		TEmployee	1
	No	TripIsFishingSeason	Varchar	3	Not Null			1
	No	TripDate	Date		Not Null			January 25, 2020
	No	TripZipCode	Int		Not Null		TZipCode	1
	No	TripWeather	Varchar	100	Not Null			Sunny
	No	TripIsBooked	Varchar	50	Not Null			Booked
	No	TripNumOfDays	Int		Not Null			Five
	No	TripNumOfParticipants	Int		Not Null			Eleven
	No	TripRegulations	Varchar	100	Not Null			
	No	TripGuidePreferences	Varchar	100	Not Null			Guide One
TProduct	Yes	ProductID	Int (Auto)	1				1
	No	ProdName	Varchar	50	Not Null			Fly
	No	SalePrice	Int	1	Not Null			50.00
	No	ProductType	Varchar	50	Not Null			DIY
TCustomer	Yes	CustomerID	Int (Auto)		Not Null	1		1
	No	CustTypeID	Int (Auto)		Not Null	1	TCustomerType	1

	No	CustZipCodeID	Int (Auto)		Not Null	1	TZipCode	1
	No	CustFirstName	Varchar	50	Not Null			John
	No	CustLastName	Varchar	50	Not Null			Karinsky
	No	Custemail	Varchar	50	Not Null			John.Karinsky.com
TRole	Yes	RoleID	int		Not Null	1		1
	No	RFunction	Varchar	100	Not Null			Sales
	No	RDescription	Varchar	100	Not Null			Manage Vendor
TDIY	Yes	DIYBundleID	Int (Auto)		Not Null	1		1
	No	DIYFlyProductID	Int		Not Null		TFly	2
	No	DIYFlyProduct	Int		Not Null		TFly	3
	No	DIYDescription	Varchar	100	Not Null			Family Packages
	No	DIYQuanitity	Int		Not Null			6
TFly	Yes	FlyProductID	Int(Auto)		Not Null			1
	No	FlyName	Varchar	10	Not Null			FlyA
	No	FlyColorID	Int		Not Null		TColor	Blue
	No	FlySizeID	Int		Not Null		TSize	5
	No	FlyPatternID	Int		Not Null		TPattern	Stripped
	No	FlyIsDurable	Varchar	3	Not Null			Yes
	No	FlyIsGoodQuality	Varchar	3	Not Null			Yes
	No	FlyIsEffective	Varchar	3	Not Null			Yes
	No	FlyIsTestPassed	Varchar	3	Not Null			Yes
	No	FlySalesPrice	Decimal	(3,2)	Not Null			3.99
	No	FlyPurchaseOrder	Decimal	(3,2)	Not Null			4.99
	No	FlyQty_OH	Int		Not Null			1
	No	FlyQty_Commanded	Int		Not Null			1
	No	FlyQty_Avail	Int		Not Null			1
	No	FlyQty_BackOrdered	Int		Not Null			1
	No	FlyLocation	Varchar	10	Not Null			BackStock
TChannelType	Yes	ChannelTypeID	Int (Auto)	-	Not Null	1	-	1
	No	ChanDescription	Varchar	100	Not Null	-	-	Online
	No	ChanHandler	Varchar	100	Not Null	-	-	Salesperson Name
TSalesOrder	Yes	SOID	Int (Auto)	-	Not Null	1	-	1
	No	SOCustID	Int	-	Not Null	-	TCustomer	1
	No	SOEmpID	Int	-	Null Allowed	-	TEmployee	1
	No	SOPackTypeID	Int	-	Not Null	-	TPack	1
	No	SOChannelTypeID	Int	-	Not Null	-	TChannelType	1
	No	SODiscountID	Int	-	Not Null	-	TDiscount	1
	No	SOItemName	Varchar	100	Not Null	-	-	Fly
	No	SOPaymentMethod	Varchar	50	Not Null	-	-	Cash or Card
	No	SOSaleDate	Varchar	100	Not Null	-	-	01-25-20
	No	SOStatus	Varchar	50	Not Null	-	-	Delivered
TProduct	Yes	ProductID	Int (Auto)	-	Not Null	1	-	1
	No	ProdName	Varchar	100	Not Null	-	-	Fly
	No	SalePrice	Decimal	50	Not Null	-	-	20.00
	No	ProductType	Varchar	100	Not Null	-	-	Fly or Pack

TPattern	Yes	PatternID	Int (Auto)	-	Not Null	1	-	1
	No	PatDescription	Varchar	100	Not Null	-	-	Stripe
	No	PatColor	Varchar	100	Not Null	-	-	Red
	No	PatSize	Varchar	100	Not Null	-	-	Small
TSize	Yes	SizeID	Int (Auto)	-	Not Null	1	-	1
	No	SizeDescription	Varchar	100	Not Null	-	-	Medium
TShippingType1	Yes	ShippingTypeID1	Int (Auto)	-	Not Null	1	-	1
	No	SPTDescription1	Varchar	100	Not Null	1	-	Ground
TDeliveryOut	Yes	DellID	Int (Auto)	-	Not Null	1	-	1
	No	DOSOID	Int	100	Not Null	-	TSalesOrder	1
	No	DOShipDate	Date	100	Not Null	-		11/13/2020
	No	DOShippingCost	Float	(10,2)	Not Null	-		123.99
	No	DOShippingTypeID	Int	-	Not Null	1	TShippingType1	1
	No	DOCarrier	Varchar	100	Not Null	-		FedEx
	No	DOTrackingNumber	Varchar	100	Not Null	1		123456789
TPurchaseOrder	Yes	TPurchaseOrderID	Int (Auto)		Not Null	1		1
	No	POEmpID	Int		Not Null		TEmployee	2
	No	PODate	Date		Not Null			2019-07-13
	No	POTotal	Int		Not Null			2500
TPurchaseOrderLine	Yes	PurchaseOrderLineID	Int (Auto)		Not Null	1		1
	No	POLPOID	Int		Not Null		TPurchaseOrder	1
	No	POLDFlyID	Int		Not Null		TFly	1
	No	POLQuantity	Int		Not Null			6
	No	POLLineTotal	Int		Not Null			143
TVendor	Yes	VendorID	Int (Auto)		Not Null	1		1
	No	VName	Varchar	50	Not Null			Diam Corp
	No	VVendorAccount	Int		Not Null			128
	No	VTerms	Varchar	100	Not Null			2/10 net 30
	No	VZipCodeID	Int		Not Null		TZipCode	2
	No	VTimesUsed	Int		Not Null			5
	No	VDollarsSpent	Int		Not Null			15000
	No	VPhone	Varchar	15	Not Null			(393)930-6609
	No	VContactName	Varchar	50	Not Null			Kyle Carney
	No	VFlyingTechniques	Varchar	100	Not Null			Triple Top

Project Management

Team Members: Sahrin Moytree, Sara Mulli	ns, Khady Ndoye, Hillary Neaves, Lam Nguyen							
Project Start Date	10/8/2020			Project End Date	12/06/2020		Cost (per 60 min)	$300
Elysian Fly Company	Student Name	Duration (Min)	% Complete	Planned Minutes	Actual Minutes	Difference Minutes	Subtotal Minutes	Subtotal Cost
Milestone 1								
Read Case + Prepare Questions for client	All Team Members	60	100%	120	60	60		
Client Meeting	All Team Members	15	100%	15	15	0		
ERD Design	Khady Ndoye, Hillary Neaves, Lam Nguyen, Sara Mullins	60	100%	120	60	60		
Assumptions	All Team Members	60	100%	120	60	60		
Write-up preparation	Sahrin Moytree	240	100%	120	240	-120		
Sub Total						60	435	$2,175
Milestone 2								
Feedback Corrections	Hillary Neaves	120	100%	60	120	-60		
Normalization	Khady Ndoye, Sara Mullins, Lam Nguyen	240	100%	60	240	-180		
Write-up preparation	Sahrin Moytree	120	100%	60	120	-60		
Reviewing and Finalizing	Hillary Neaves	60	100%	60	60	0		
Sub Total						-300	540	$2,700
Milestone 3								
Milestone 3 Document	Hillary Neaves	120	100%	60	120	0		
Presentation	All Team Members	90	100%	90	90	0		
TState, TZipCode,TCustomerType, TDiscountType, TDiscount, TSalesOrderLine, TColor, TTrip, TFly	Khady Ndoye	240	100%	120	240	120		
TchannelType, TSalesOrder, TProduct, TSize, TPattern	Hillary Neaves	240	100%	120	240	120		
TBOW, TBOWKnown, TRole, Tcustomer	Lam Nguyen,	240	100%	120	240	120		
TDIY,TEmployee	Sara Mullins	60	100%	120	60	-60		
	Sahrin Moytree		100%	120	0	-120		
Query 1	Khady Ndoye	60	100%	60	60	0		
Query 6 & New query 1	Lam Nguyen	60	100%	60	60	0		
New queries 2 & 3	Hillary Neaves	60	100%	60	60	0		
No queries	Sara Mullins		100%					
No queries	Sahrin Moytree		100%					
Reviewing and Finalizing	Khady Ndoye	60	100%	60	60	0		
Sub Total						0	1230	$6,150
Final Submission								
Milestone 3 corrections	All team members	60	100%	60	60	0		
Document updates	Sahrin Moytree, Sara Mullins, Hillary Neaves, Khady Ndoye	240	100%	240	240	0		
No tables	Khady Ndoye							
No tables	Hillary Neaves							
TPurchaseOrder, TPurchaseOrderLine, TVendor, TFly	Lam Nguyen	60	100%	60	60	0		
	Sara Mullins							
TShippingType, TDeliveryOut	Sahrin Moytree	60	100%	60	60	0		
Queries 1 to 7	Khady Ndoye	240	100%	240	240	0		
No queries	Hillary Neaves							
No queries	Lam Nguyen							
Queries 8 to 14	Sara Mullins	240	100%	240	240	0		
No queries	Sahrin Moytree							
User Documentation	Khady Ndoye	60	100%	60	60	0		
Reviewing and Finalizing	All team members	60	100%	60	60	0		
Sub Total						0	1020	$5100
						Total	3,065	$16,125