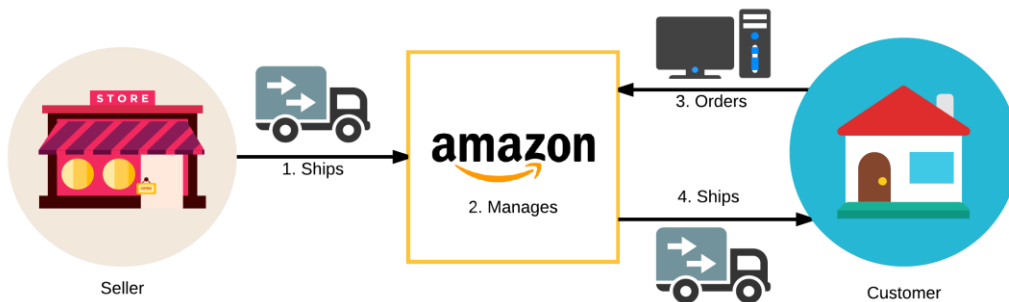


## Section 1: Project Introduction

The start-to-finish experience you gain from this project will help prepare you for database work in the industry. You will apply theoretical concepts and applied skills you learn throughout the course for this term project.

### Introduction to Selling on Amazon

Amazon fulfillment: Amazon handles the inventory, orders, shipping, returns, and customer service on behalf of the seller. To plug in to the marketplace, the seller only needs deliver the products to one of Amazon's warehouses. Amazon takes over from there. Essentially, with Amazon's marketplace, the roles change – sellers become suppliers, and Amazon becomes the seller. This process looks as follows.



### Attribution

Amazon logo retrieved from <http://amazon.com> on Oct-07-2017.

## Use Cases

Below are a series of use cases that help describe the operations your database supports.

*New Product Use Case* – This occurs when a seller plans to sell a product it has not sold before.

1. The seller searches Amazon's product list to determine if another seller is already selling the product.
2. If a different seller is already selling the product, a new listing is not required; the seller re-uses the same listing.
3. If the product is not yet sold on Amazon, a new listing is created with the product's name, description, price, and other relevant items. Every product added is linked to a product category (all categories are predefined by Amazon), for example, "Computers", "Electronics", "Appliances", and similar.

*Product Delivery Use Case* – This occurs when a seller sends one or more units of a product to Amazon so that they can be sold.

1. The seller ships one or more units of a product to Amazon's warehouse, along with information that indicates to Amazon what the product is, how many units there are, and the condition (new, used, etc ...).
2. After Amazon receives the product(s), it updates the seller's inventory so that customers can purchase the product.

*Product Purchase Use Case* – This occurs when a customer purchases a product from Amazon that was provided by a seller.

1. The user logs in to Amazon under their account.
2. A customer selects one or more products on Amazon's website. When selecting a product, the customer is actually selecting a particular seller's inventory while doing so, though they might not realize this because the process is seamless on Amazon's website.
3. The customer selects a shipping speed (super saver shipping, standard shipping, two-day, one-day) and finalizes their choices.
4. Amazon decrements the seller's inventory for the products purchased.
5. Amazon creates an order which tracks which customer purchased which products from which sellers.

*Product Shipment Use Case* – This occurs when Amazon ships the products a customer purchased.

1. Amazon packages up the purchased products, and assigns an identifier to package so that it can be tracked.
2. Amazon links the package to the customer's order.
3. Amazon ships the package to the default address linked to the customer's account.
4. Amazon notifies the customer that it has been shipped and provides the customer with the tracking ID.

## Section 2: Project Breakdown

**Entity-Relationship Diagram:** Create a logical Entity-Relationship diagram (ERD) using crows foot notation for this project. Your tables should be normalized to 3NF and or BCNF, or accompanied with a justification as to why the table was not normalized to BCNF. Please keep the scope limited to between 10 and at most 20 tables.

### DDL and sample data

1. Create the tables, and constraints (such as PKs and FKs) which are consistent with your ERD design.
2. Create sample data insert scripts (i.e. products, customers, etc)  
To help prove that your queries work, your tables need to be populated with sample data. In particular, all queries required by the scenarios below should return results. For example, if a query selects only results matching a condition, there should be some underlying data that meets the condition, and other data that does not meet the condition. Each table only needs a small number of rows with enough variety to help prove out the queries; you can use 10 rows as a rough guideline.

### DML Scenarios

1. Create a query which returns information about products including product name, product category, it's price, description and availability of existing products in the "Computers" or "Electronics" categories that cost \$30 or less. This query should show joins of multiple tables. Develop and execute a single query that provides this information.
2. A seller requests a listing of all of its products that have an inventory of 11 or less sold in the past 2 months. Develop and execute a single query that provides this information.
3. The marketing department at Amazon wants to reach out to customers who buy popular products. The department requests the names and addresses of all customers who bought any product that was purchased by at least three different people. Develop and execute a single query that provides this information.
4. The marketing department at Amazon would like to know the top single product from each of the three categories (your choice of categories). Develop and execute a single query that provides this information.
5. Create a stored procedure which allows seller to add a new product. Invoke the stored procedure twice to add these products, keeping in mind that products have at a minimum a name, description, quantity, price, and category. Execute a query that shows the inserted information from executing the stored procedure.
6. Create a stored procedure which allows seller to change details of an existing product. Invoke the stored procedure twice to modify two different products, keeping in mind that products have at a minimum a name, description, quantity, price, and category. Execute a query that shows the inserted information from executing the stored procedure.
7. Here you define you own query. Define a request for information for this aspect that is implemented with aggregation and or a subquery – for an extra challenge make it a correlated sub-query! Then develop and execute a single query that provides this information.

**Index:** Create and justify a single index that is beneficial to at least one query in your implementation. Include screenshots illustrating the creation of the index, along with brief explanation as to why the index is beneficial (be specific).

## Section 3: Project Summary

This section wraps up what was described to help summarize what should be included with your project, and how your project will be evaluated.

### Deliverables

Your final project submission will include two files -- a Word document and a zip file. The contents of each are explained below.

#### *Word Document Contents*

Your Word document should contain:

- a. your logical ERD and any narrative/structural business rules which help explain your design.
- b. screenshots of the SQL addressing the 7 DML scenarios (make sure to include screenshots of the query or stored procedure creation as well as the results of execution).
- c. a screenshot illustrating the creation of the index, along with an explanation as to why the index is beneficial (be specific).

The Word document does not need to include screenshots of other SQL, such as your table creation and data inserts, unless you want to clarify something. All of your SQL will be included in the zip file, so your instructor can refer to these scripts for additional details. *Keep in mind that part of the term project grade is exposition, so make sure to use sections and headers to keep the document organized, and to include explanations of any aspects of your project that warrant it.*

#### *Zip File Contents*

Your zip file will contain SQL scripts that enable your instructor to re-create your schema and execute your use case queries against the schema. A SQL script is nothing more than a text file that has a “.sql” extension in the filename. The following three scripts should be included:

- a. your “DDL” script which contains the SQL DDL to create the tables, constraints
- b. your “insert” script which inserts data into the tables.
- c. your “DML” script which contains the queries and stored procedure definitions and invocations.

## Grading Criteria

Project will be graded using the following rubric

	Grade	Qualities Demonstrated by the Project Submission	Grade Assigned
Content (70%) Measures the quality of the content in the assignment	A+ 100	The content demonstrates exceptional understanding of all relevant subject matter and its inter-relationships. All major relevant issues are thoroughly covered, and all content is very focused and on-topic. There is no known way to improve the content, and there are absolutely no technical or coverage errors present.	
	A 96	The content demonstrates exceptional understanding of all relevant subject matter and its inter-relationships. All major relevant issues are thoroughly covered, and all content is very focused and on-topic. At most one insignificant technical or coverage error may be present	
	A- 92	The content demonstrates deep understanding of all relevant subject matter and its inter-relationships. All major relevant issues are covered, and all content is on-topic.	
	B+ 89	The content demonstrates understanding of all relevant subject matter and its inter-relationships. Almost all major relevant issues are covered, and the content is at least reasonably on-topic.	
	B 86	The content demonstrates understanding of most relevant subject matter and its inter-relationships. Almost all major relevant issues are covered, and all content is at least reasonably on-topic.	
	B- 82	The content demonstrates moderate understanding of much relevant subject matter and its inter-relationships. There is reasonable coverage of major relevant issues, and the content is at least reasonably on-topic.	
	C+ 79	The content demonstrates some understanding of relevant subject matter and its inter-relationships. Some major relevant issues are covered, and at least some content is on-topic.	
	C 76	The content demonstrates understanding of a small portion of the relevant subject matter and its inter-relationships. Some major relevant issues are covered, and at least a small portion of the content is on-topic.	
	C- 72	The content demonstrates little understanding of and insight into the relevant subject matter and its inter-relationships. A small portion of the major relevant issues are covered. The focus of the content may be off topic or on insubstantial or secondary topics	
	D 66	The content demonstrates almost no understanding of or insight into the relevant subject matter and its inter-relationships. Almost none of the major relevant issues are covered, and the content may be almost entirely off-topic.	
	F 0	The content demonstrates no understanding of or insight into the relevant subject matter and its inter-relationships. No major relevant issues are covered, and the content is entirely off-topic.	
Exposition (30%) Measures how well the content is expressed	A+ 100	The presentation of all ideas and designs is exceptionally clear and persuasive; the entire submission is exceptionally organized. There is no known way to improve the clarity or organization of the submission.	
	A 96	The presentation of all ideas and designs is exceptionally clear and persuasive; the entire submission is exceptionally organized. There may be at most one insignificant way to improve the clarity or organization of the submission.	
	A- 92	The presentation of all ideas and designs is very clear and persuasive; the entire submission is very organized.	
	B+ 89	The presentation of all ideas and designs is clear and persuasive; the entire submission is organized.	
	B 86	The presentation of most ideas and designs is clear and persuasive; most of the submission is organized.	
	B- 82	The presentation of most ideas and designs is generally clear; most of the submission is reasonably organized.	
	C+ 79	Some parts of the submission are hard to understand; some parts are disorganized.	
	C 76	About half of the submission is hard to understand; about half is disorganized.	
	C- 72	Most parts of the submission are hard to understand; most parts are disorganized.	
	D 66	Almost all of the submission is hard to understand and disorganized.	
	F 0	The entire submission is hard to understand and disorganized.	
Overall Assignment Grade:			