Database Group Project

Restaurant name: Grinta Ristorante

School name: Wentworth institute of technology

Course name: DATABASES-COMP-2650-02

Course number: 15071

Professor name: Nguyen Thai

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Group: Fengnan Zhang, Ahmed Diab

Tasting a country’s cuisine is like interpreting a country’s history and culture, and when we talk about food that represents a country and its culture, we cannot ignore Italian food. Italian food is the most traditional food in Europe, a food that is well known for its quality, simplicity, variety, and taste. In Grinta, you will have the opportunity to explore the culture of Italy by tasting many of the different Italian meals and dishes. If you’re interested in that, don’t miss us!

In Grinta, we have Italian food such as pasta, pizza, risotto, balsamic vinegar and Italian ice cream, coffee, and so on. The layout here makes you feel like you are in Rome or Milan. Simple and elegant, relaxed and fashionable design, open kitchen before you taste the authentic Italian cuisine, you can also witness the chef's cooking style. It is worth introducing the pizza here. It is very thin and will not make you feel full after you taste the pizza. A steak, a Margherita pizza, and a glass of authentic Italian red wine, it feels like entering the country of Italy.

Grinta Restaurant is an Italian resistant located in Boston. Three restaurants provide the same type of food, same environment, and also same numbers of employees, Grinta is trying to make a big chain restaurant in the United State.

In Grinta, It provides all kinds of products include Salads, Sides, Sandwiches, Pasta, Meats, soup, and all kinds of drinks. For example of the sandwiches, there are Italian Hero, Roast Beef, Grilled Chicken, Meatball Parmigiana, and Turkey sandwiches. There are have more than 30 types of Spaghetti, Baked Ravioli, Baked Ziti, Baked Meat Lasagna, Chicken Parmigiana, Spaghetti with Sausage, Spaghetti with meatballs, and so on. For all the meals and drinks, you can visit our website if you want to check more options and pictures. There is always have one who will be the customer's favorite.

Grinta doesn't have a big storage, because it used most of the area for dining to give all the customer's better experience when they enjoy the food. For the area in each restaurant, there are ten tables, there are four tables for families (about 6 persons), four for couples (2 persons), two tables for the event (8 persons), so a total of 60 chairs including waiting line. It always makes sure that we have seats for you. Grinta is trying to make people are more comfortable and have a high experience of Italian food.

In three restaurants, there are about 70 Employees in totally, including chefs, cashiers, waiters, and busboys, for those jobs, they are all spared for a part-time and full-time job. We also help some students to get the experience of doing a part-time job as a business major. During the holidays and new year, for employees, Grinta also provides seasonal jobs to incurring the server's needs and also to keep the quality of services.

In Grinta, one of our main priorities is to always order fresh food for our customers. Therefore, we don’t buy ready-made food. Instead, we cook 100% of our dishes by ourselves. For the three restaurants we opened in Boston, we have all the same type of food for each one. For example, We serve fresh sandwiches, hot soups, homemade linguine spaghetti, special coffee for brunch, and many more.

Flexibility is one of Grinta's characteristics, so it always cares about hiring employees who have the flexibility to work in multiple locations restaurants, So, some of our employees work in different locations of our restaurants, in case we need to justify the holidays busy hours usually. The busy hours will be also different depending on the locations of the restaurant.

Grinta provides take-outs and signed contracts with Uber and Lyft companies. So when customs using these two delivered applications, they will be able to choose the location and ask for delivery. For paying the bills, Grinta also accepts Cash, Debit, Credit, and Apple Pay, you also can get VIP services that you can pay with your credits with Grinta, for example, for every 10 dollars you spent in Grinta, you will get 1 point for 1 dollar back. For holidays or customers' birthdays, Grinta also sells gift cards with discounts which depend on the seasons There are many ways that you can order your food and you never worry about your payments.

Since Grinta is a very busy and traditional restaurant, it doesn’t have online reservations, anyone can reserve by phone call if necessary. Customers don’t need to worry about some special food. We will ask customers if they have any food allergies or any special dietary restrictions. Whenever you have the call with Grinta or when you take a walk-in.

For space of Grinta. It doesn't have its own space, it went to 12000 square meters for three different locations. For each one of those restaurants. Grinta has to pay $35000 per month for each location and its parking lot.

Grinta has 16 parking spots for customers, including 2 special parking spots for handicaps, and 5 spots for employees, and other spots are for normal customers. We have signed a lease contract with the building owner for 5 years. So the restaurant can have our Italian decoration and to have an elegant environment, and stable customers.

To keep our dishes' quality and always serve fresh food for our customers, Grinta has a contract with a supermarket and food company that provides us with the food and other supplies needed for our business, so we can have fresh ingredients every morning, also in this way, it can same the time and also reduce the payment of the employee for going the market by themself.

For employees, there are awards each year for hard workers. Grinta gives every employee for 500 gift card every year if that employee is never late for work and also doesn't have a day off in unnecessary situations, of course, there will be a double salary if any employee is willing to work extra hours at busy hours or holidays. Offering bonuses or incentives for those who complete the season may seem excessive, but it's a highly effective method for retaining seasonal help. From having a smooth season compared to a hectic one. Along the way, offer incentives that will make your employees happy and deter them from quitting. Ensuring that you retain a well-trained and capable staff throughout your busy season is well worth the cost. So to have a great employee

management system and stable business, Grinta has three best employees awards for 1000 dollars every year.

In Grinta, it needs to monitor the sales and try to understand what are the busy and slow times for us. This information helps us to always be prepared for busy times, and get the most from these times. In Grinta, our data shows that from 6 pm - 9 pm, we make double or triple the amount of revenue we generate at other times of the day. It’s the dinner rush, and it’s the best time for us to make the most revenue. It’s also the most important time to be prepared. Also, one of our branches is located in downtown, which is a business area, therefore, this branch is always very busy from 11:30 am - 1:30 pm during the lunchtime, so we also care to always be prepared during this rush time.

As with all other restaurants, Grinta's busiest weekdays are Fridays and Saturdays, and the slowest weekdays are Mondays and Tuesdays. Based on this information, we always prepare for busy days and times by having enough stuff, ingredients, and other resources on hand. Also, we prepare extra dishes, premix drink specials, and develop other preemptive habits. Also, we do Staff training, meetings, and back-office during our slow time, so all of our employees can pitch in during the rush. In short, we do everything to make our busy time a success.

For the slow days, we create some strategies to boost these times. For example, we make menu offers to get more sales. Also, to encourage customers to dine in during the slow time, we make targeted marketing efforts. For example, we send direct push notifications to our customers about the offers and discounts and special menu offers. Based on our customer’s database, we send them customized birthday and anniversary

discounts to encourage them to come in or order food, and also to increase customers' loyalty to Grinta.

In Grinta, As most restaurants do, The open hours are from 9 a.m. to 11 p.m. from Monday to Saturday, only Sunday it closes at 9 p.m. The restaurant is usually busy at 4 p.m.- 8. p.m. from M - Thursday, also from 4 p.m. -10.p.m. on Weekends. So during those hours, we have more employees. Usually, we have 5 full time employees from 9 a.m. to 3 p.m., and another team works from 3 p.m. to 11 p.m. For busy hours, we have part-time job employees who will be overlap from 4 p.m.-8 p.m. we will make sure the quality of services.

For the price of the product, we have an average price for Spaghetti, but we do have the most refreshing ingredients, great wines from Europe, and the best service. As we mentioned before, we cook 100% of our dishes by ourselves and make sure all the ingredients are fresh each day from the food company delivery.

Compared to other restaurants, Grinta will offer a 10% discount for customers' first come in. To explore the business, this policy will also be on our website. Welcome to check the website to get more information. For a special event, It has Happy hours, from 2- 4 p.m. from Monday to Thursday, anyone came from for those time, Grinta provides specials meals for 50% off for example for the chef recommends. Expected the holiday's event and happy hours, Grinta also has the house special meals for each Friday night.

Grinta has a parking lot, or customers can park on the street, good neighborhood offers some holidays activities, family discounts, customers' VIP credits and happy hours, great Italian music. Grinta isn't perfect, but every day it's trying to do better, continually working

to preserve our planet. We are proud of all of our work to be an amazing and friendly restaurant, and we look forward to serving you. Make a reservation today!

1-Entity List

GRINTA

GrintaID

Location

Phone Number

CUSTOMER

Customer ID

Customer Name

Customer Address

Customer Email

Customer Phone Number

isVIP(yes,no)

PIZZA

Pizza ID

Name

Size

Price

{Toppings}

[Sauce]

SANDWICH

Sandwich ID

Name

Size

Price

{Ingredients}

DISH

Dish ID

Name

Size

Price

{Ingredients}

DRINK

Drink ID

Name

Size

Price

{Ingredients}

isAlcoholic (yes, no)

SIDE

Side ID

Name

Size

Price

{Ingredients}

Equipment

Equipment ID

Type

Price

Size

Employee

Employee ID

Name

Position

Email

Phone Number

Full Time (yes, no)

Part Time (yes, no)

Seasonal Job (yes, no)

REVENUE

Revenue ID

Dine-in Income

Take-out Income

EXPENSE

Expense ID

Salary

Rent

Electric Bill

Water Bill

Ingredients Cost

Equipments Cost

EXTRA EXPENSE

Extraexpense ID

Renovation Cost

Promotion Cost

RENOVATION

Renovation ID

Renovation Type

Renovation expense

Renovation Frequency

Date Start

Date End

PROMOTION

Promotion ID

Promotion Type

Promotion Cost

Promotion Frequency

Date Start

Date End

2- Relationships

1. Restaurant and customers

A Restaurant must have many customers

A Customer may or may not order from many restaurants

2. Restaurant and employ

A Restaurant must have many employees

An Employee must work in only one location.

3. Restaurant and Equipment

A Restaurant must have many Equipments

Equipment must be in only one restaurant.

4. Restaurant and Revenue

A Restaurant must have many Revenues.

A Revenue must be for only one restaurant.

5. Restaurant and Expense

A Restaurant must have many Expenses.

An Expense must be for only one restaurant.

6. Restaurant and Extra Expense

A Restaurant may or may not have many Extra Expenses.

An Extra Expense must be for only one restaurant.

7. Restaurant and Renovation

A Restaurant may or may not have many renovations.

A renovation may or may not be for many restaurants.

8. Restaurant and Promotion

A Restaurant may or may not have many promotions.

A promotion may or may not be for many restaurants.

9. Restaurant and Pizza

A Restaurant must have many pizzas

A pizza may or may not be sold in many restaurants.

10. Restaurant and Dish

A Restaurant must have many Dishes

A Dish may or may not be sold in many restaurants.

11. Restaurant and Sandwich

A Restaurant must have many Sandwiches

A Sandwich may or may not be sold in many restaurants.

12. Restaurant and Drink

A Restaurant must have many Drinks

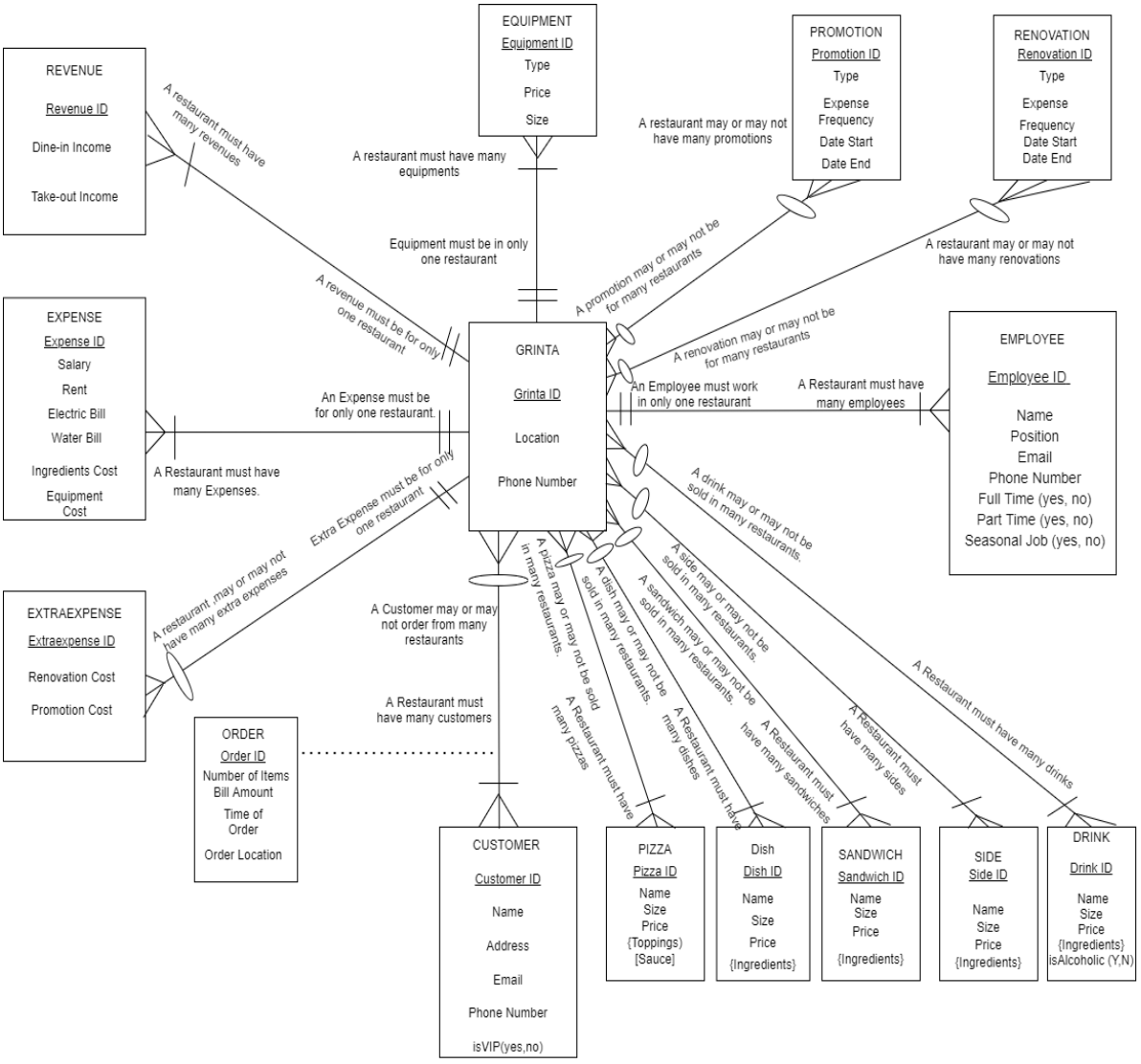
A Drink may or may not be sold in many restaurants.

13. Restaurant and Side

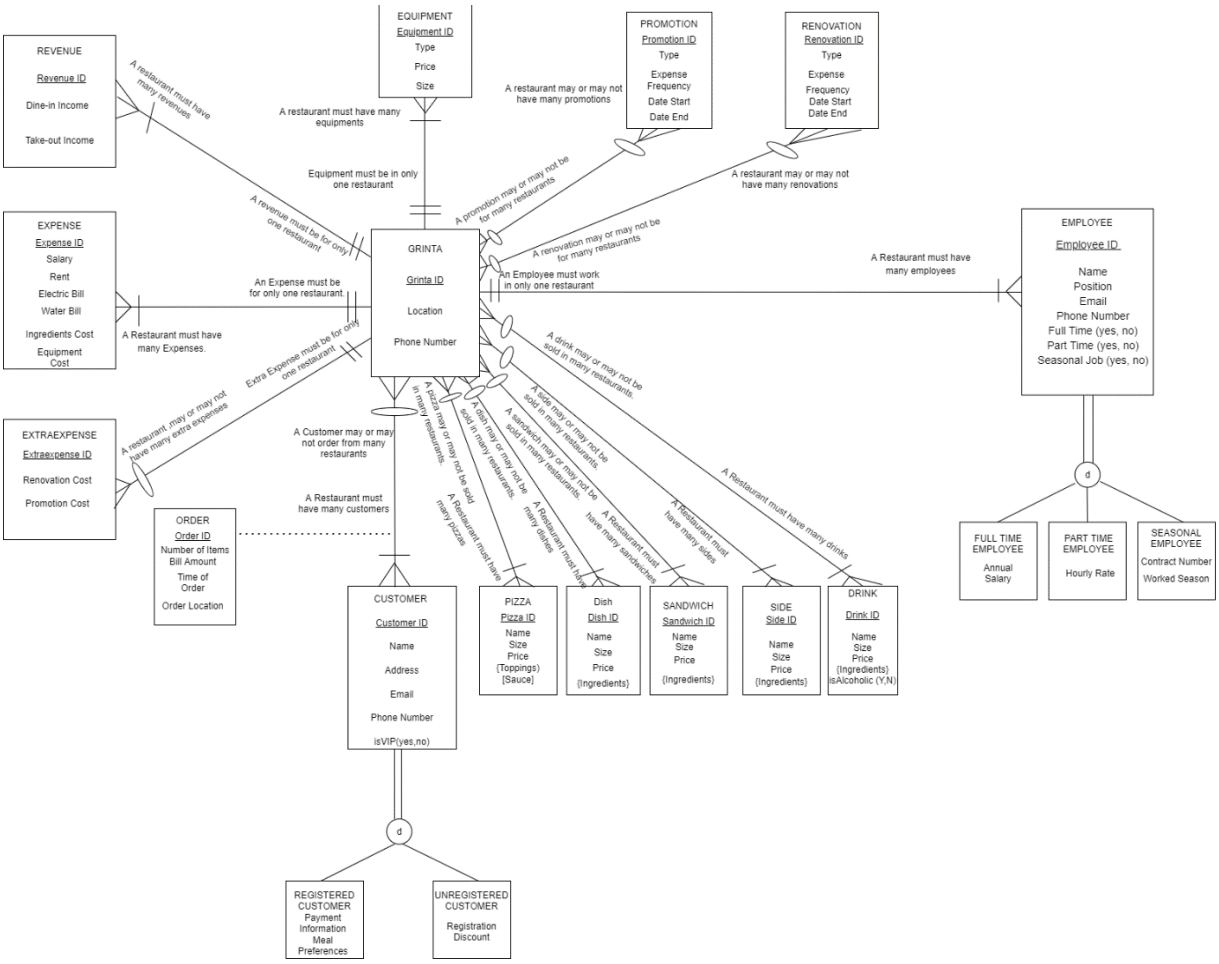
A Restaurant must have many Sides

A Side may or may not be sold in many restaurants.

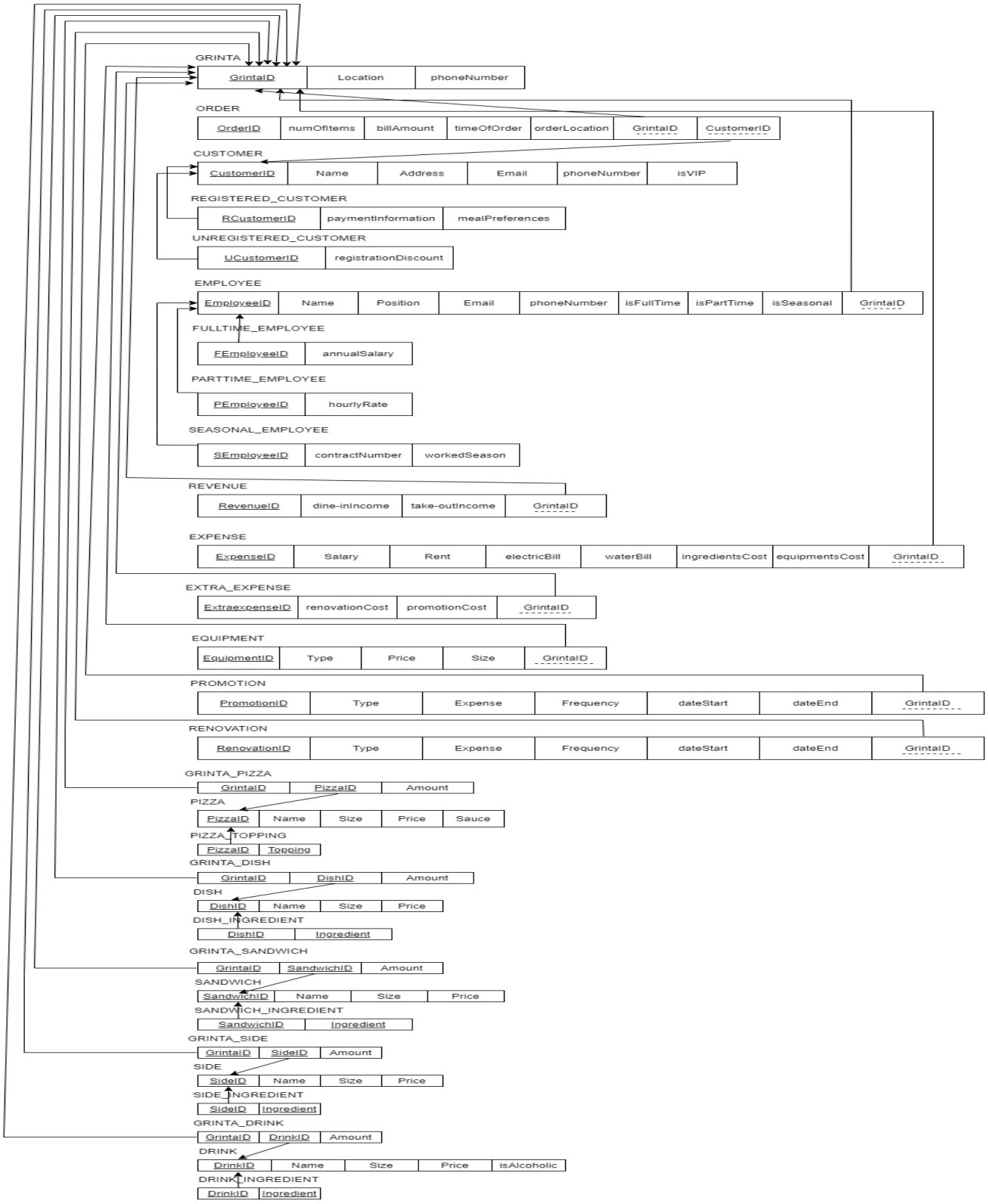
3- Entity Relationship Diagram



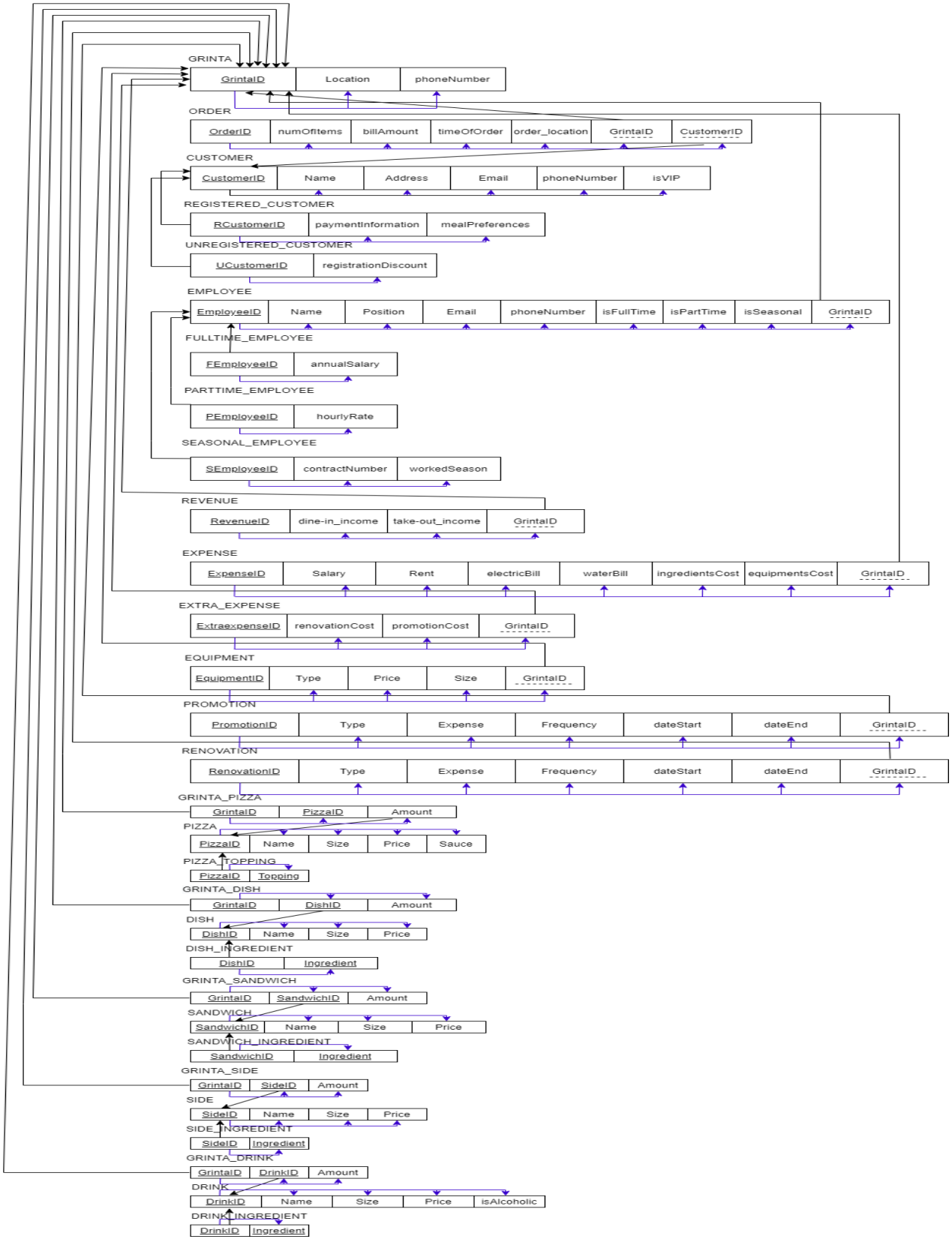
4- Enhanced Entity Relationship Diagram



Relational Data Model

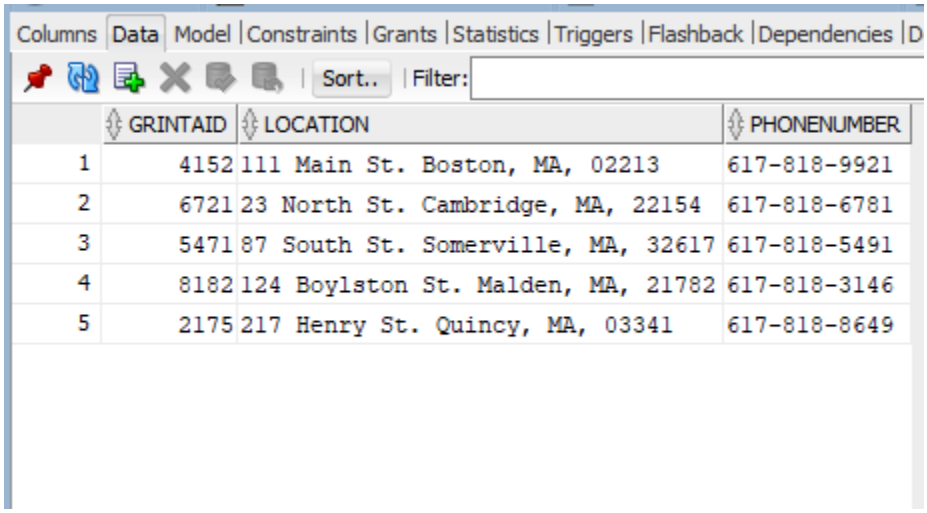


Third Normal Form



Tables' Screenshots

1- Grinta

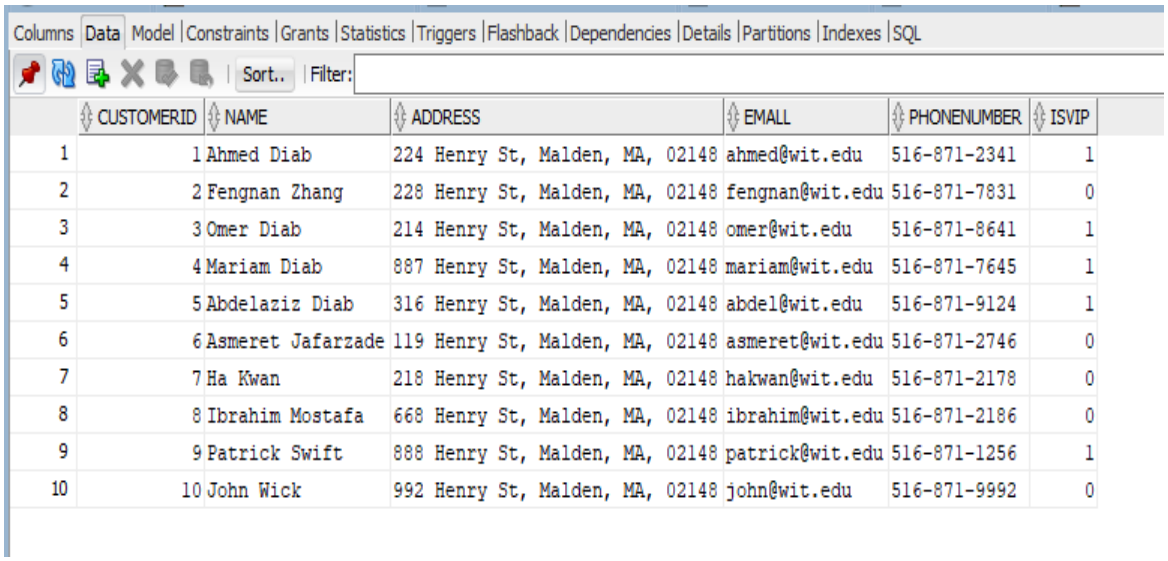


Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | D

Sort.. | Filter:

	GRINTAID	LOCATION	PHONENUMBER
1	4152	111 Main St. Boston, MA, 02213	617-818-9921
2	6721	23 North St. Cambridge, MA, 22154	617-818-6781
3	5471	87 South St. Somerville, MA, 32617	617-818-5491
4	8182	124 Boylston St. Malden, MA, 21782	617-818-3146
5	2175	217 Henry St. Quincy, MA, 03341	617-818-8649

2- Customer



Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions | Indexes | SQL

Sort.. | Filter:

	CUSTOMERID	NAME	ADDRESS	EMALL	PHONENUMBER	ISVIP
1	1	Ahmed Diab	224 Henry St, Malden, MA, 02148	ahmed@wit.edu	516-871-2341	1
2	2	Fengnan Zhang	228 Henry St, Malden, MA, 02148	fengnan@wit.edu	516-871-7831	0
3	3	Omer Diab	214 Henry St, Malden, MA, 02148	omer@wit.edu	516-871-8641	1
4	4	Mariam Diab	887 Henry St, Malden, MA, 02148	mariam@wit.edu	516-871-7645	1
5	5	Abdelaziz Diab	316 Henry St, Malden, MA, 02148	abdel@wit.edu	516-871-9124	1
6	6	Asmeret Jafarzade	119 Henry St, Malden, MA, 02148	asmeret@wit.edu	516-871-2746	0
7	7	Ha Kwan	218 Henry St, Malden, MA, 02148	hakwan@wit.edu	516-871-2178	0
8	8	Ibrahim Mostafa	668 Henry St, Malden, MA, 02148	ibrahim@wit.edu	516-871-2186	0
9	9	Patrick Swift	888 Henry St, Malden, MA, 02148	patrick@wit.edu	516-871-1256	1
10	10	John Wick	992 Henry St, Malden, MA, 02148	john@wit.edu	516-871-9992	0

3- Registered_Customer

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions

Sort.. | Filter:

	RCUSTOM...	PAYMENTINFO	MEALPREFERENCE
1	1	4461-8879-7821-8561_02/24_214	Spicy Food
2	2	6681-5521-7189-4762_05/24_256	Pizza
3	3	5381-2176-2871-9781_05/26_891	Spicy Food
4	4	6182-6624-2871-5571_07/26_218	Extra Sauce
5	5	5381-8921-2218-4105_04/26_459	No Sauce

4- Unregistered_Customer

	UCUSTOMERID	REGISTERATION_DISCOUNT
1	6	15
2	7	12.5
3	8	12.5
4	9	12.5
5	10	15

5- Order

	ORDERID	NUM_OF_ITEMS	BILLAMOUNT	TIMEOFORDER	ORDER_LOCATION	GRINTAID	CUSTOMERID
1	4165	10	75.5	15-NOV-21	Table 10	6721	1
2	7861	6	54.1	15-NOV-21	Table 8	5471	1
3	2148	7	70	15-NOV-21	Table 6	8182	1
4	1984	12	105.25	15-NOV-21	668 Henry St, Malden, MA, 02148	4152	8
5	2286	4	26.5	15-NOV-21	218 Henry St, Malden, MA, 02148	8182	7

6- Employee

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions | Indexes | SQL

Sort.. | Filter:

	EMPLOY...	NAME	POSITION	EMAIL	PHONENUMBER	IS_FULL_TIME	IS_PART_TIME	IS_SEASONAL	GRINTAID
1	1	Amanda Zhang	Manager	amanda@wit.edu	516-871-2341	1	0	0	4152
2	2	Fengnan Diab	Kitchen Manager	fengnan@wit.edu	516-871-7831	1	0	0	4152
3	3	Omer Hu	Assistant Manager	omer@wit.edu	516-871-8641	1	0	0	4152
4	4	Amhed Du	Chef	Amhed@wit.edu	516-871-7645	1	0	0	6721
5	5	Abdelaziz Diab	Pastry Chef	abdel@wit.edu	516-871-9124	1	0	0	6721
6	6	Asmeret Jafarzade	Waiter	asmeret@wit.edu	516-871-2746	0	1	0	6721
7	7	Sam Kwan	Waiter	sam@wit.edu	516-871-2178	0	1	0	5471
8	8	Ibrahim Mostafa	Waiter	ibrahim@wit.edu	516-871-2186	0	1	0	5471
9	9	Patrick Swift	Waiter	patrick@wit.edu	516-871-1256	0	1	0	5471
10	10	John Wick	Waiter	john@wit.edu	516-871-9992	0	1	0	8182
11	11	mariam Zhang	Waiter	mariam@wit.edu	516-871-2341	0	0	1	8182
12	12	Brain Robert	Manager	btain@wit.edu	516-871-2341	0	0	1	8182
13	13	Lily Zhang	Manager	lily@wit.edu	516-871-2341	0	0	1	2175
14	14	Ray Hu	Waiter	ray@wit.edu	516-871-2341	0	0	1	2175
15	15	Jack Walk	Waiter	jack@wit.edu	516-871-2341	0	0	1	2175

7- FullTime_Employee

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback

Sort.. | Filter:

	FEMPLOYEEID	ANNUALSALARY
1	1	850000
2	2	750000
3	3	750000
4	4	650000
5	5	650000

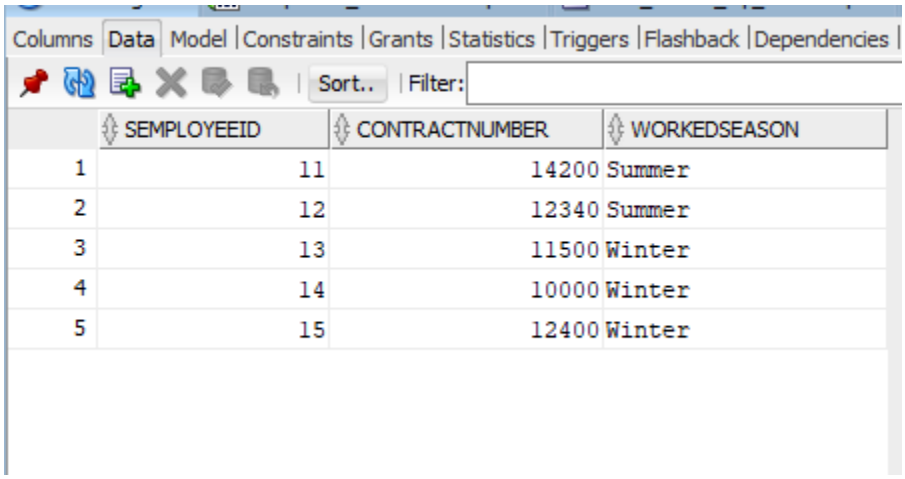
8- PartTime_Employee

Columns | Data | Model | Constraints | Grants | Statistics | Trig

Sort.. | Filter:

	PEMPLOYEEID	HOURLYRATE
1	6	25
2	7	25
3	8	25
4	9	25
5	10	25

9- Seasonal_Employee

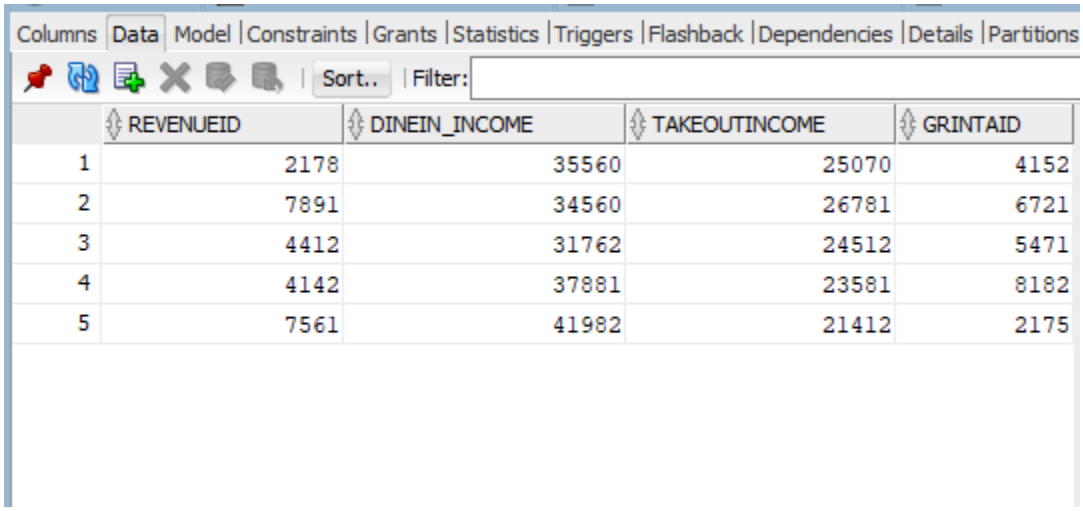


Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies

Sort.. | Filter:

	SEMPLOYEEID	CONTRACTNUMBER	WORKEDSEASON
1	11	14200	Summer
2	12	12340	Summer
3	13	11500	Winter
4	14	10000	Winter
5	15	12400	Winter

10- Revenue

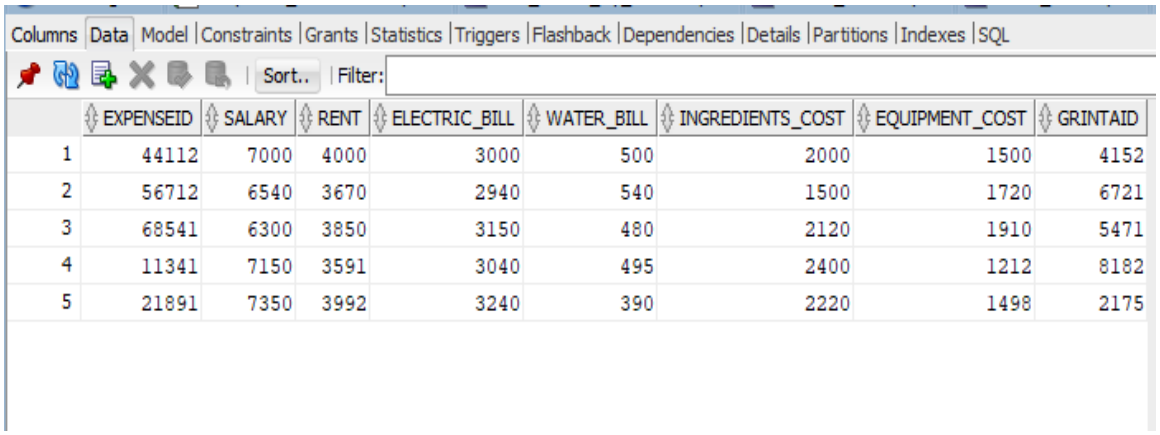


Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions

Sort.. | Filter:

	REVENUEID	DINEIN_INCOME	TAKEOUTINCOME	GRINTAID
1	2178	35560	25070	4152
2	7891	34560	26781	6721
3	4412	31762	24512	5471
4	4142	37881	23581	8182
5	7561	41982	21412	2175

11- Expense

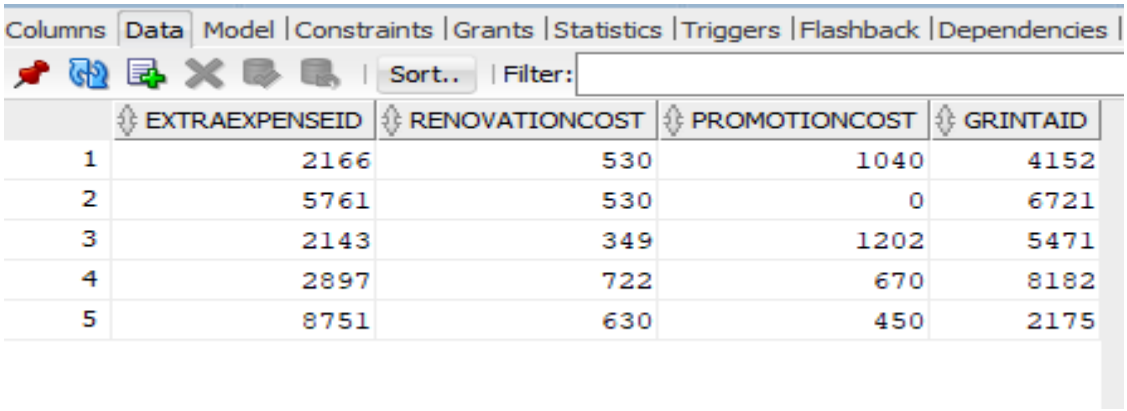


Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions | Indexes | SQL

Sort.. | Filter:

	EXPENSEID	SALARY	RENT	ELECTRIC_BILL	WATER_BILL	INGREDIENTS_COST	EQUIPMENT_COST	GRINTAID
1	44112	7000	4000	3000	500	2000	1500	4152
2	56712	6540	3670	2940	540	1500	1720	6721
3	68541	6300	3850	3150	480	2120	1910	5471
4	11341	7150	3591	3040	495	2400	1212	8182
5	21891	7350	3992	3240	390	2220	1498	2175

12- Extra_Expense

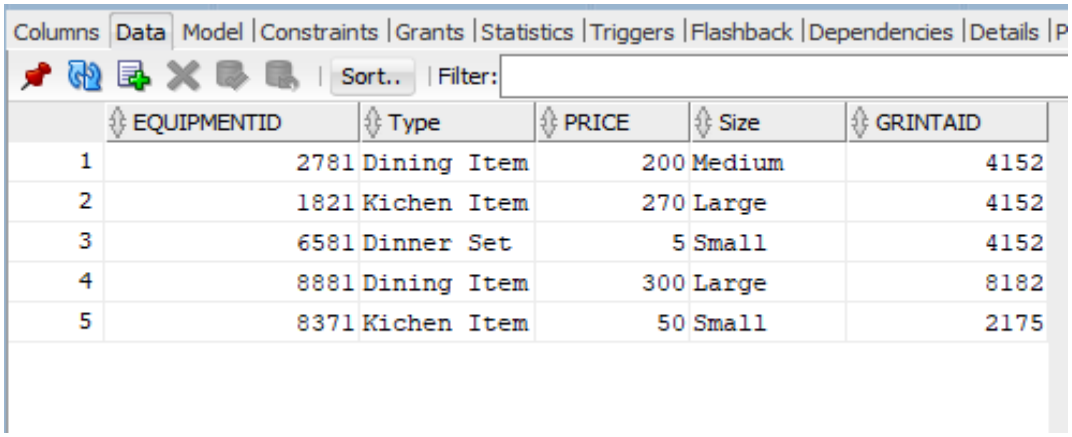


Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies

Sort.. | Filter:

	EXTRAEXPENSEID	RENOVATIONCOST	PROMOTIONCOST	GRINTAID
1	2166	530	1040	4152
2	5761	530	0	6721
3	2143	349	1202	5471
4	2897	722	670	8182
5	8751	630	450	2175

13- Equipment

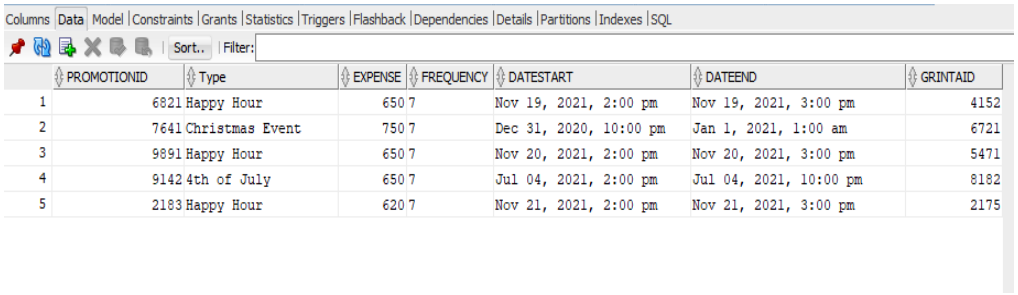


Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | P

Sort.. | Filter:

	EQUIPMENTID	Type	PRICE	Size	GRINTAID
1	2781	Dining Item	200	Medium	4152
2	1821	Kichen Item	270	Large	4152
3	6581	Dinner Set	5	Small	4152
4	8881	Dining Item	300	Large	8182
5	8371	Kichen Item	50	Small	2175

14- Promotion

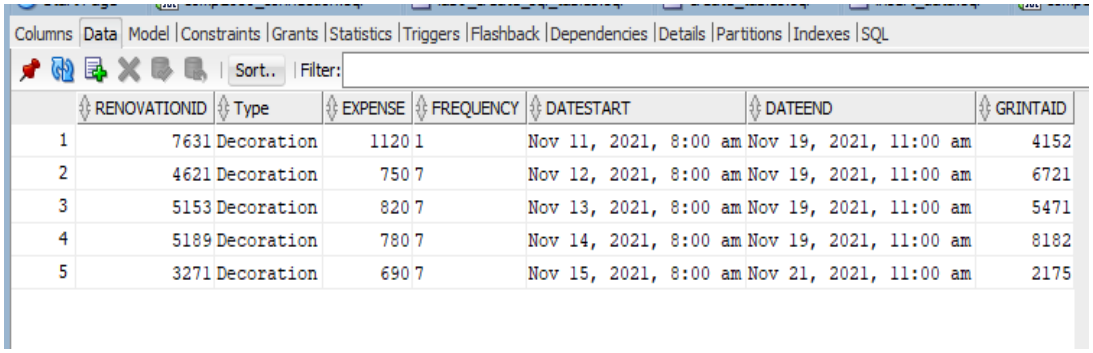


Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions | Indexes | SQL

Sort.. | Filter:

	PROMOTIONID	Type	EXPENSE	FREQUENCY	DATESTART	DATEEND	GRINTAID
1	6821	Happy Hour	650	7	Nov 19, 2021, 2:00 pm	Nov 19, 2021, 3:00 pm	4152
2	7641	Christmas Event	750	7	Dec 31, 2020, 10:00 pm	Jan 1, 2021, 1:00 am	6721
3	9891	Happy Hour	650	7	Nov 20, 2021, 2:00 pm	Nov 20, 2021, 3:00 pm	5471
4	9142	4th of July	650	7	Jul 04, 2021, 2:00 pm	Jul 04, 2021, 10:00 pm	8182
5	2183	Happy Hour	620	7	Nov 21, 2021, 2:00 pm	Nov 21, 2021, 3:00 pm	2175

15- Renovation

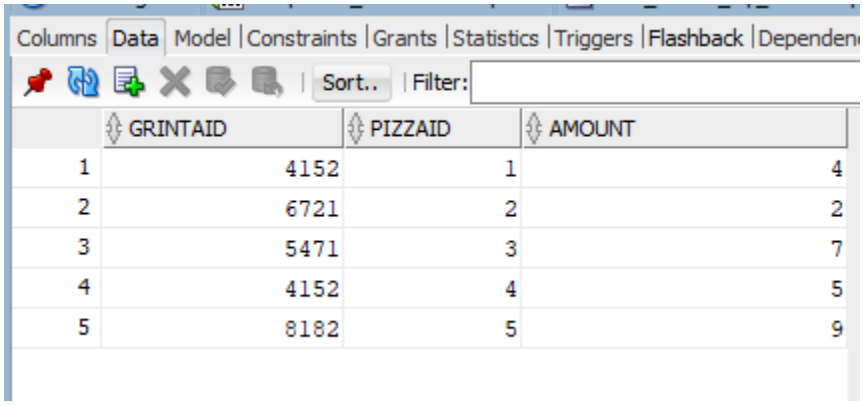


Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions | Indexes | SQL

Sort.. | Filter:

	RENOVATIONID	Type	EXPENSE	FREQUENCY	DATESTART	DATEEND	GRINTAID
1	7631	Decoration	1120	1	Nov 11, 2021, 8:00 am	Nov 19, 2021, 11:00 am	4152
2	4621	Decoration	750	7	Nov 12, 2021, 8:00 am	Nov 19, 2021, 11:00 am	6721
3	5153	Decoration	820	7	Nov 13, 2021, 8:00 am	Nov 19, 2021, 11:00 am	5471
4	5189	Decoration	780	7	Nov 14, 2021, 8:00 am	Nov 19, 2021, 11:00 am	8182
5	3271	Decoration	690	7	Nov 15, 2021, 8:00 am	Nov 21, 2021, 11:00 am	2175

16-Grinta_Pizza

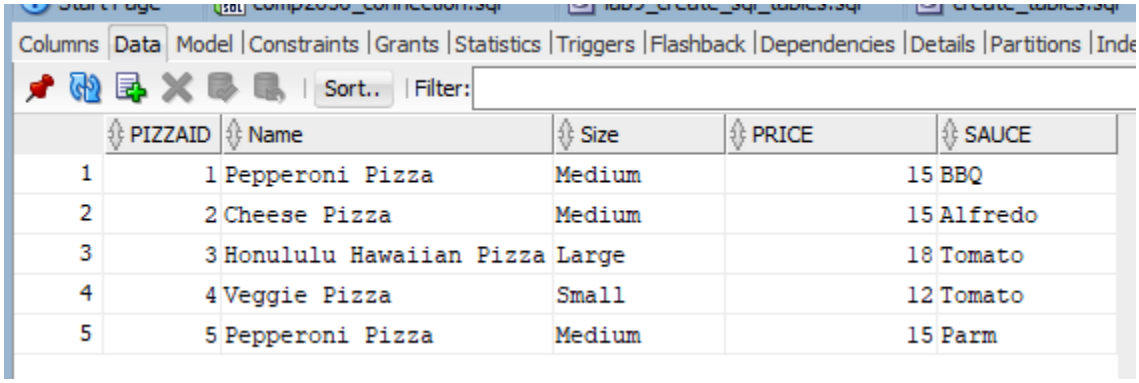


Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependen

Sort.. | Filter:

	GRINTAID	PIZZAID	AMOUNT
1	4152	1	4
2	6721	2	2
3	5471	3	7
4	4152	4	5
5	8182	5	9

17- Pizza

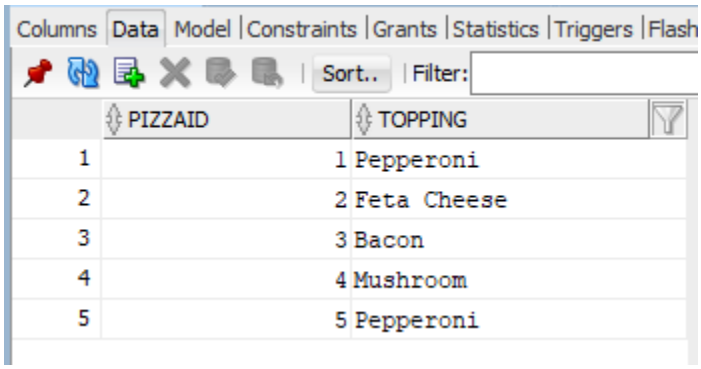


Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions | Inde

Sort.. | Filter:

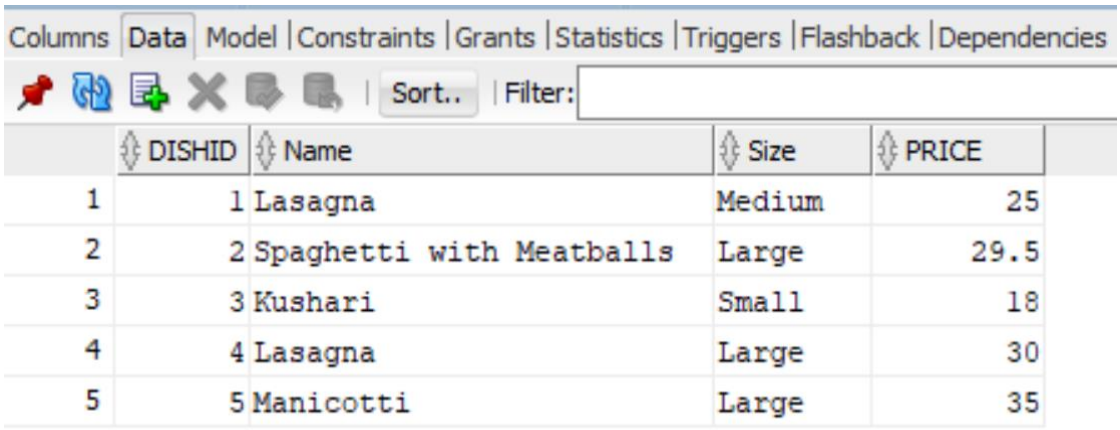
	PIZZAID	Name	Size	PRICE	SAUCE
1	1	Pepperoni Pizza	Medium	15	BBQ
2	2	Cheese Pizza	Medium	15	Alfredo
3	3	Honululu Hawaiian Pizza	Large	18	Tomato
4	4	Veggie Pizza	Small	12	Tomato
5	5	Pepperoni Pizza	Medium	15	Parm

18- Pizza_Topping



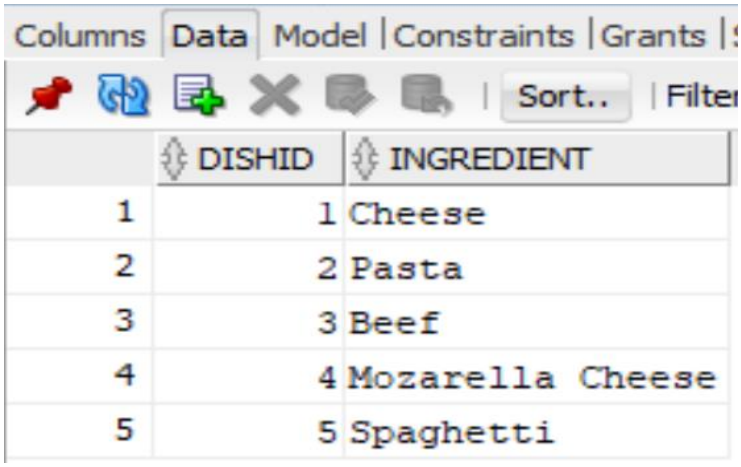
	PIZZAID	TOPPING
1	1	Pepperoni
2	2	Feta Cheese
3	3	Bacon
4	4	Mushroom
5	5	Pepperoni

19- Dish



	DISHID	Name	Size	PRICE
1	1	Lasagna	Medium	25
2	2	Spaghetti with Meatballs	Large	29.5
3	3	Kushari	Small	18
4	4	Lasagna	Large	30
5	5	Manicotti	Large	35

20- Dish_Ingredient



	DISHID	INGREDIENT
1	1	Cheese
2	2	Pasta
3	3	Beef
4	4	Mozarella Cheese
5	5	Spaghetti

21- Grinta_Dish

Columns | Data | Model | Constraints | Grants | St

Sort.. | Filter:

	GRINTAID	DISHID	AMOUNT
1	4152	1	3
2	6721	2	2
3	5471	3	1
4	4152	4	6
5	8182	5	3

22- Sandwich

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependen

Sort.. | Filter:

	SANDWICHID	Name	Size	PRICE
1	1	Steak Cheese	Medium	16
2	2	Italian Beef	Large	21.5
3	3	Hawaiian Grinder	Small	15
4	4	Veg Cheese Sandwich	Large	22.5
5	5	Masala Burger	Small	12

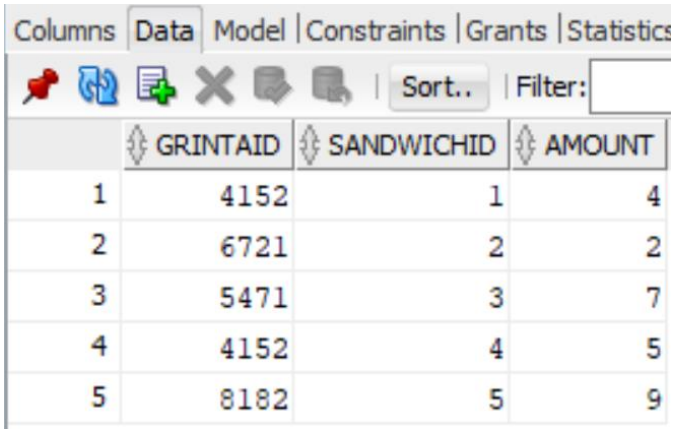
23- Sandwich_Ingredient

Columns | Data | Model | Constraints | Grants | Statistics | T

Sort.. | Filter:

	SANDWICHID	INGREDIENT
1	1	Steak
2	2	Beef
3	3	Bacon
4	4	Feta Cheese
5	5	Burger

24-Grinta_Sandwich

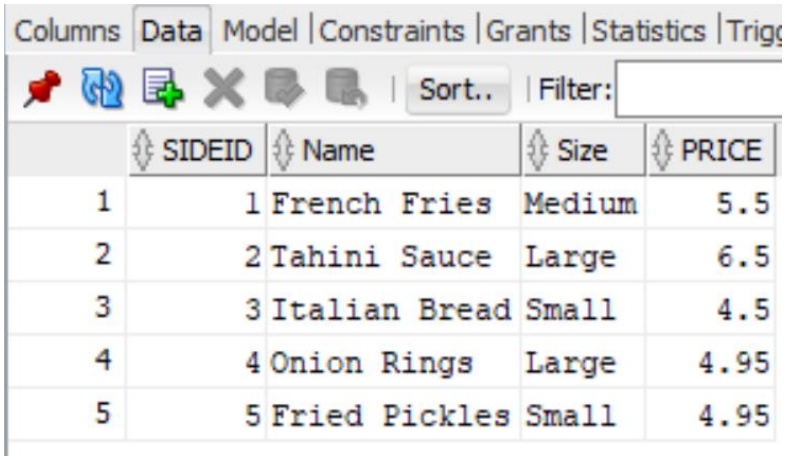


Columns | Data | Model | Constraints | Grants | Statistics

Sort.. | Filter:

	GRINTAID	SANDWICHID	AMOUNT
1	4152	1	4
2	6721	2	2
3	5471	3	7
4	4152	4	5
5	8182	5	9

25- Side

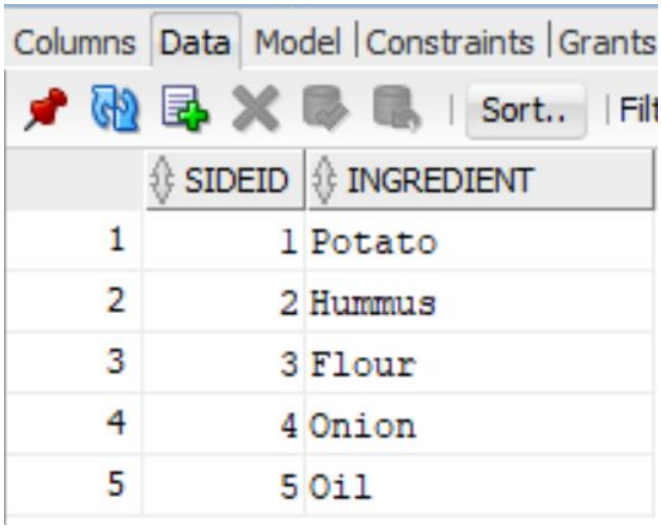


Columns | Data | Model | Constraints | Grants | Statistics | Trigg

Sort.. | Filter:

	SIDEID	Name	Size	PRICE
1	1	French Fries	Medium	5.5
2	2	Tahini Sauce	Large	6.5
3	3	Italian Bread	Small	4.5
4	4	Onion Rings	Large	4.95
5	5	Fried Pickles	Small	4.95

26- Side_Ingredient

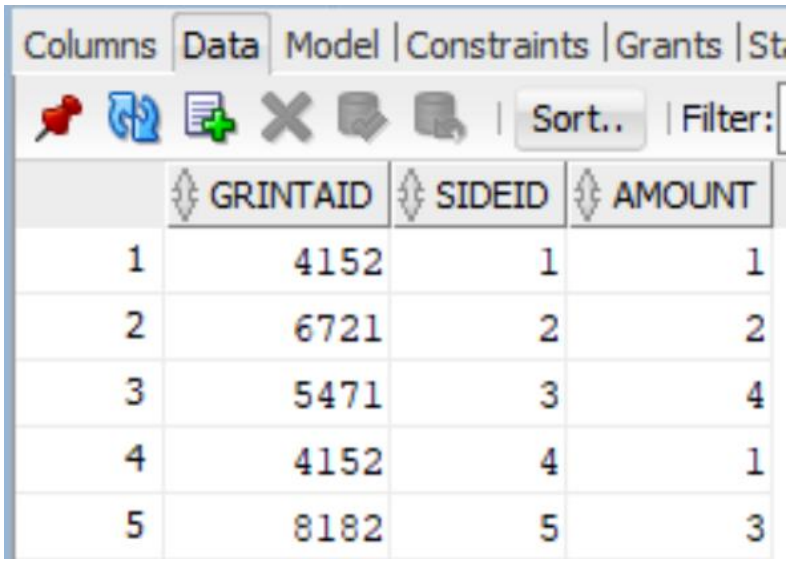


Columns | Data | Model | Constraints | Grants

Sort.. | Filt

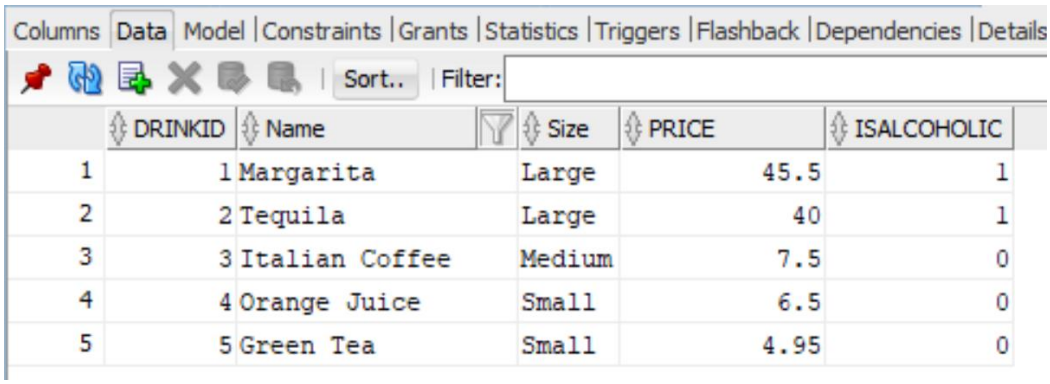
	SIDEID	INGREDIENT
1	1	Potato
2	2	Hummus
3	3	Flour
4	4	Onion
5	5	Oil

27- Grinta_Side



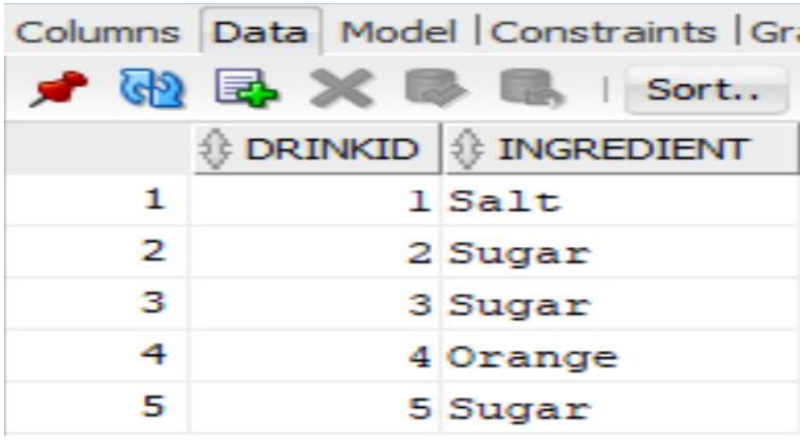
	GRINTAID	SIDEID	AMOUNT
1	4152	1	1
2	6721	2	2
3	5471	3	4
4	4152	4	1
5	8182	5	3

28- Drink



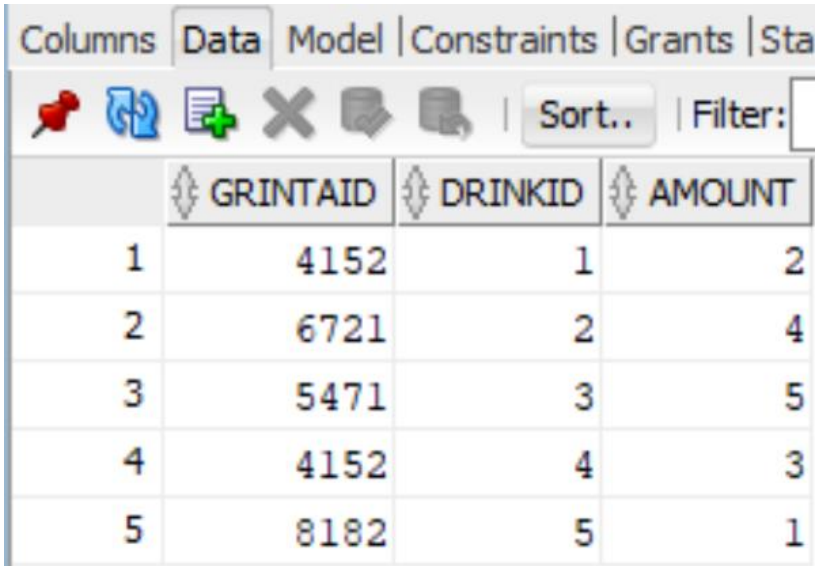
	DRINKID	Name	Size	PRICE	ISALCOHOLIC
1	1	Margarita	Large	45.5	1
2	2	Tequila	Large	40	1
3	3	Italian Coffee	Medium	7.5	0
4	4	Orange Juice	Small	6.5	0
5	5	Green Tea	Small	4.95	0

29- Drink_Ingredient



	DRINKID	INGREDIENT
1	1	Salt
2	2	Sugar
3	3	Sugar
4	4	Orange
5	5	Sugar

30- Grinta_Drink



	GRINTAID	DRINKID	AMOUNT
1	4152	1	2
2	6721	2	4
3	5471	3	5
4	4152	4	3
5	8182	5	1

Final Report

This final report documents the process of analyzing, designing, implementing, and developing our database system to be used in an Italian restaurant named Grinta. The second part of the report talks about the problems we are trying to solve, the data model, data analysis charts (graphs and SQL table). In the end, this report also provides recommendations for what Grinta to do next.

Building a database to help improve restaurant businesses is the main goal of this project. Using a comprehensive restaurant management system that combines accounting and operations is the main pattern to achieve this goal. At the beginning of the ideas, we analyzed the five parts of the business. It includes Food and drinks popularity, Employee salary distribution, sale of meals vs drinks, revenue, and expense per month. This statement also displays the reasons why Grinta needs those data and all the tables, how much it cost for every 5 parts, how much revenue per month does Grinta gained, what The benefits from building database management of Grinta restaurant, should the database constructor needs to be improved, and how to make the project more understandable and effective for business.

For the food and drink popularity, Grinta provides all kinds of products including Salads, Sides, Sandwiches, Pasta, Meats, soup, and all kinds of drinks. We need tables to keep tracking the orders and analyzing the best sell. For all the meals and drinks. Grinta cooks 100% of our dishes by ourselves. For the three restaurants we opened in Boston, we also have all the same type of food for each location. Given the popularity of Pizza, To attract more customers, Grinta offers different toppings and sizes, such as Pepperoni Pizza,

Cheese Pizza, Honolulu Hawaiian Pizza, and Veggie Pizza. Grinta has different sauces, BBQ, Alfredo, Tomato, Parm, even small details Grinta made by our own kitchens. We use the pizza ID to track every order we sold per month, compare for all the food, Pizza is the most popular food, and it's a low-cost production and delivery, therefore, Pizza is a big part of the profits.

There is no doubt that Employee salary distribution is a large part of the restaurant's expenditure. Then how to balance the contribution and salary of each position of the employee is the main problem we analyze in this database project. As we mentioned in the previous busyness statement, there are about 70 Employees in total, including chefs, cashiers, waiters, and busboys; for those jobs, they are all spared for a part-time and full-time job. During the holidays and new year, for employees, Grinta also provides seasonal jobs to incur the server's needs and also to keep the quality of services. Keeping all the employees active, tracking their work experience, and recording the salary of each employee is a big part of the database.

a. For full-time employees, they have annually between $65000 and $85000 per year, it depends on the position and services tips. So a full-time employee makes a salary between $5416 and $7083 per month.
b. For part-time employees, they have an hourly rate of about $25 per hour. If one of the employees works 25 hours per week, the salary for part-time will be $2500 per month.
c. For seasonal employees, employees have the same hourly pay rate as a part-time job, which is 25 per hour, but compared to part-time employees, seasonal employees have some parts of the benefits such as insurance, unemployment

compensation. Because each season, they work about 3 months for hours per week, it's considered as a seasonal full-time employee. Grinta has two seasons to hire more people. The winter job will be from December to February for holidays, and summer jobs will be from June to August. For each person who has worked with Grinta, the system has the records and track numbers for seasonal job employees.

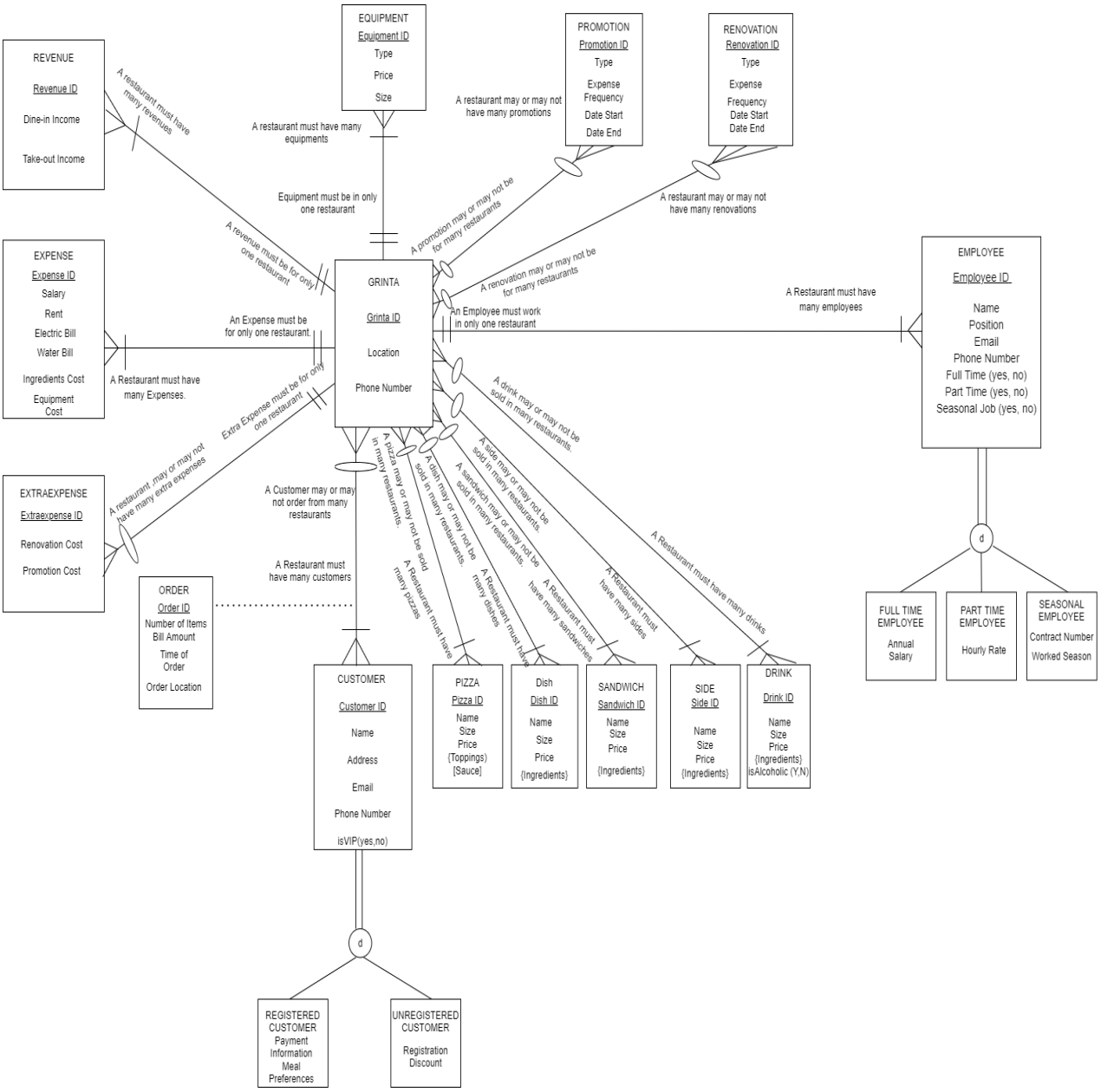
This database has 15 examples of three different types, the database tracks each employee by their unique employeeID. A super-type entity is called Employee, and then the system has subtype entities for Full-time, part-time, and seasonal employees so that they all will inherit the common attributes from their abstract employee constructor. There shows how the SQL database works to identify and record the details of each different type of employee. Flexibility is one of Granta's characteristics, so it always cares about hiring employees who have the flexibility to work in multiple locations restaurants, So, some of our employees work in different locations of our restaurants. We need to monitor the sales and try to understand what are the busy and slow times for us. This information helps us to always be prepared for busy times.

For the sale of meals vs drinks, according to the data analysis there, it's easy to show that most of the time, the sales of a lot of drinks also can increase income and bring more benefits. Restaurants sold more drinks (wines) instead of soup or other basic drinks can bring more profits. Because soup costs fresh ingredients, labor costs, and cook time, it is also not easy to store. This greatly increases the expense. When Grinta had a house special event, more elegant and high-quality wine drinks such as Margarita.

There are three reasons that our data has to build the expense tables and keep tracking them every month. At the end of each month, check the difference between actual expenditures and planned expenditures. If you are overspending, you can look at what types of expenses have been spent. In any case, you still need to connect the changes in the restaurant to the market (For example, there are more promotions, and a little control next month. Expenditure preparation. Salary increase, layoffs) Pay cuts, price increases, etc.) should be taken into consideration, and the overall finances of the restaurant should be planned effectively and reasonably. This project records the expenses for each month so that people can easily find out which part is necessary because it brings some extra income. There are many expenses the restaurant does for promotion costs and renovation costs. Expenses in the Oracle SQL database include many parts, Employee salary, $34340 total per month for three locations and its parking lot, holiday events, Happy hours, fees for ingredients from food companies every morning, and Equipment. Some of them are. For example, seasonal events like Halloween and Christmas attract more customers during the holidays. In addition, we need to understand that changing the long-term profitability status is much more difficult than changing the next month's budget, but the impact on the restaurant will be greater, longer-term, and more worthwhile.

Build a revenue table, analyze the components of each profits part, create Granta’s own gravity database, visualize and use the power of restaurant data analysis to help you succeed in this industry. By using data to analyze and manage information, Grinta can enhance its competitive advantage, increase profitability, increase profitability, and expand its customer base. Our project provides an objective, comprehensive and

accurate display and analysis function for the daily functions of the restaurant. People need to know the profit and loss of Granta's final business, which is equal to revenue minus costs. There are two very important components in the income statement. The first part is the income part and the second part is the cost part.



The picture above shows the Enhanced Entity Relationship Diagram for our database. The diagram shows all the entities (tables) and attributes (columns) of each entity. Also, It explains the relationship between each two entities.

If we, for example, look at Grinta-Employee, we first see that Grinta has GrintaID, which is the identifier of this specific restaurant, and has a Location and phone number as attributes. For Employee, we have different types of employees in the restaurant. There are Full Time, Part-Time, and Seasonal Employees, so we have to have a different entity (table) for each type of employee, but if we think about that, all employees have many attributes (characteristics) in common. They all have a name, position, phone number, … etc, so, to prevent duplication, and also for more convenience, instead of adding these attributes to each entity of them, we have a super-type entity called Employee, and then we have A sub-type entities for Full-time, part-time, and seasonal employees, so that they all will inherit the common attributes from their parent (Employee) and each entity of them just contains the special characteristics for this type of employee, like the annual salary for FullTime Employee. As shown in the diagram, the relationship between Grinta and Employee is a one-to-many relationship, which means that each restaurant can have many employees, but each employee can only work in one restaurant.

Another example we can take from our EERD is the Grinta-Customer relationship. As we discussed in Employee entity, Customer entity has the same case, because there’re two different types of customers, so we have a super-type entity, and two sub-type entities that will inherit from the super-type. But as we can see, the relationship between customer and Grinta is many-to-many, because the restaurant will have many customers, and any customer can order from multiple restaurants. Also, we have an associative entity called Order which explains the relationship between Customer and Grinta, or in other words, Order is the link between Customer and Grinta.The diagram also takes care of other things like the revenue, expense, and extra expense, which will help in keeping track of

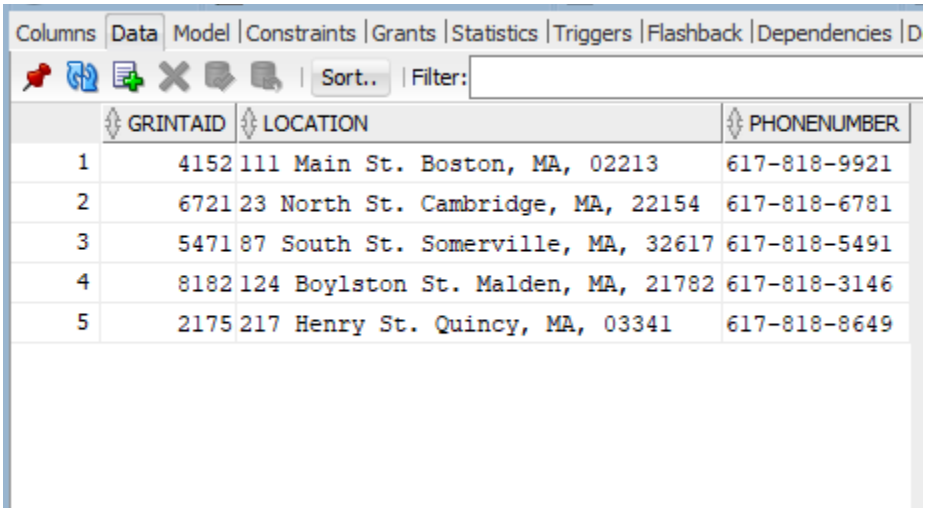
the cash flow. It also has entities for the food and drinks the restaurant offers, and more other entities.

Previous is a picture for the Third Normal Form of the relational data model of our database. As we can see, all the relations are in second normal form, and there are no transitive dependencies, which means all the attributes in each relation depend on the primary key of this relation, so they are all in the third normal form.

The model shows and explains how is each table will look like, and also shows how the relationship between the tables would be. For example, if we look at pizza relation, we'll see that a new relation was created for the multi-valued attribute (Topping), which will have a composite primary key of pizza ID, which will specify which pizza this topping belongs to, and the topping which will specify this topping from other toppings belong to the same pizza. Also, because the relation between Pizza and Grinta is a many-to-many relationship, so, a new associative relation (Grinta_Pizza) is created, which will have a composite primary key formed from the two primary keys of both relations. All of the previous explanations also apply to other food's relations, and drink relation. As we discussed in the Enhanced Entity Relationship Diagram, the Employee entity will have three sub-type entities (FullTime_Employee, PartTime_Employee, and Seasonal_Employee.) if we look at the primary key for each of them, we'll see that each primary key has a prefix to it, and is pointing towards the primary key of the super-type. We can see the same thing is happening in Customer relation and its subtypes. We can also see that Order relation, because it's an associative entity, and because it has an identifier (OrderID) it has both GrintaID and CustomerID as foreign keys. For Revenue, Expense, Extra_Expense, Equipment, Promotion, and Renovation, they all have GrintaID

as a foreign key because the relationship between each of them and Grinta is a one-to-many relationship.

Now, let's look at the table and charts and see how our database is working, and what the analysis of our data tells us.



Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | D

Sort.. | Filter:

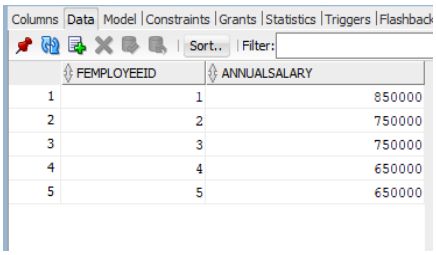
	GRINTAID	LOCATION	PHONENUMBER
1	4152	111 Main St. Boston, MA, 02213	617-818-9921
2	6721	23 North St. Cambridge, MA, 22154	617-818-6781
3	5471	87 South St. Somerville, MA, 32617	617-818-5491
4	8182	124 Boylston St. Malden, MA, 21782	617-818-3146
5	2175	217 Henry St. Quincy, MA, 03341	617-818-8649

Above is the Grinta table. As we see, there are five Grinta's restaurants, each of them has its unique Id, and its location, and phone number.

Columns | Data | Model | Constraints | Grants | Statistics | Triggers | Flashback | Dependencies | Details | Partitions | Indexes | SQL

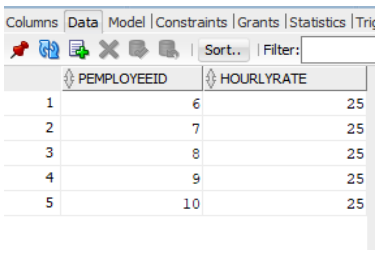
Sort.. | Filter:

	EMPLOY...	NAME	POSITION	EMAIL	PHONENUMBER	IS_FULL_TIME	IS_PART_TIME	IS_SEASONAL	GRINTAID
1	1	Amanda Zhang	Manager	amanda@wit.edu	516-871-2341	1	0	0	4152
2	2	Fengnan Diab	Kitchen Manager	fengnan@wit.edu	516-871-7831	1	0	0	4152
3	3	Omer Hu	Assistant Manager	omer@wit.edu	516-871-8641	1	0	0	4152
4	4	Amhed Du	Chef	Amhed@wit.edu	516-871-7645	1	0	0	6721
5	5	Abdelaziz Diab	Pastry Chef	abdel@wit.edu	516-871-9124	1	0	0	6721
6	6	Asmeret Jafarzade	Waiter	asmeret@wit.edu	516-871-2746	0	1	0	6721
7	7	Sam Kwan	Waiter	sam@wit.edu	516-871-2178	0	1	0	5471
8	8	Ibrahim Mostafa	Waiter	ibrahim@wit.edu	516-871-2186	0	1	0	5471
9	9	Patrick Swift	Waiter	patrick@wit.edu	516-871-1256	0	1	0	5471
10	10	John Wick	Waiter	john@wit.edu	516-871-9992	0	1	0	8182
11	11	mariam Zhang	Waiter	mariam@wit.edu	516-871-2341	0	0	1	8182
12	12	Brain Robert	Manager	btain@wit.edu	516-871-2341	0	0	1	8182
13	13	Lily Zhang	Manager	lily@wit.edu	516-871-2341	0	0	1	2175
14	14	Ray Hu	Waiter	ray@wit.edu	516-871-2341	0	0	1	2175
15	15	Jack Walk	Waiter	jack@wit.edu	516-871-2341	0	0	1	2175



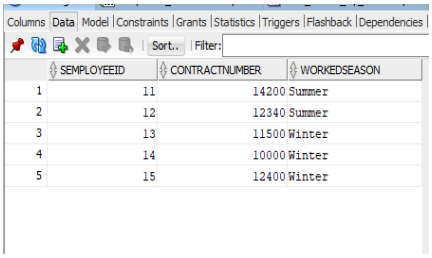
	FEMPLOYEEID	ANNUALSALARY
1	1	850000
2	2	750000
3	3	750000
4	4	650000
5	5	650000

(FullTime Table)



	PEMPLOYEEID	HOURLYRATE
1	6	25
2	7	25
3	8	25
4	9	25
5	10	25

(PartTime Table)

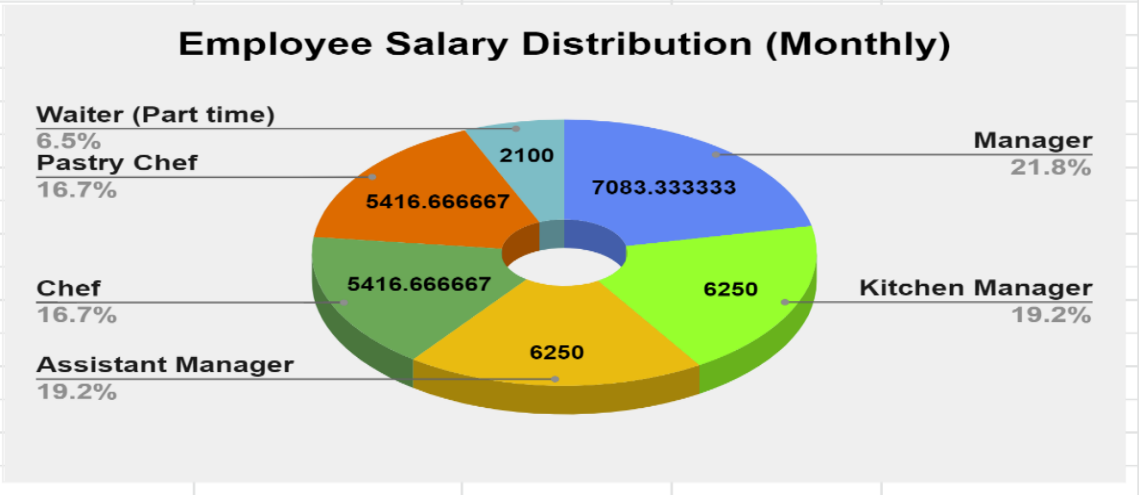


	SEMPLOYEEID	CONTRACTNUMBER	WORKEDSEASON
1	11	14200	Summer
2	12	12340	Summer
3	13	11500	Winter
4	14	10000	Winter
5	15	12400	Winter

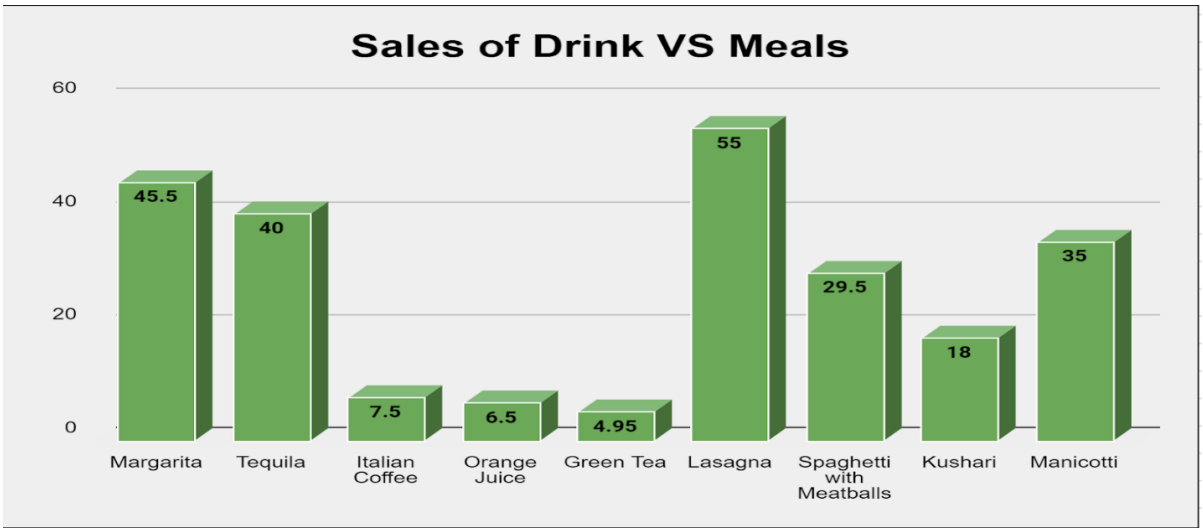
(Seasonal Table)

Above are the Employee table, which has data for 15 employees, 5 of them are full-time, 5 are part-time, and 5 are seasonal employees and the 3 sub-type tables. You will be able to know what is the type of this employee in the is_full_time, is_part_time, and is_seasonal columns. You can also see which restaurant this employee belongs to by looking at GrintaID. In the full-time table, we can see the annual salary for each full-time employee, in the part-time table, we can see the hourly rate, and in the seasonal table, we see the contract number and worked a season for each seasonal employee.

	A	B	C	D	E
1		Positions	Monthly Pay		Annual Salary
2		Manager	7083.333333		85000
3		Kitchen Manager	6250		75000
4		Assistant Manager	6250		75000
5		Chef	5416.666667		65000
6		Pastry Chef	5416.666667		65000
7		Waiter (Part time)	2100		25*84*12 = 25200

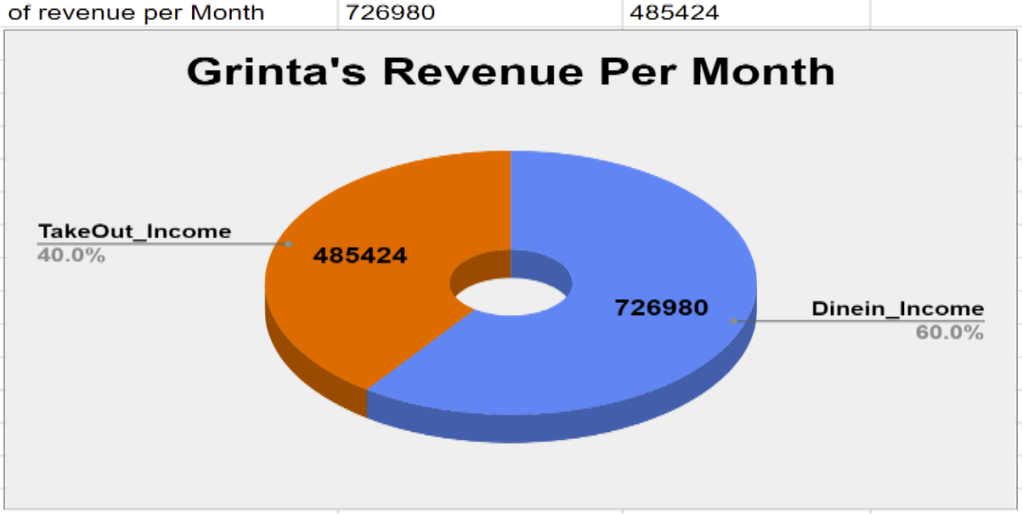


Above is the Monthly Employee Salary Distribution. Our data shows that an average manager's salary is around $7083 per month, which is the highest salary of all employees salaries, while an average waiter makes around $2100 per month, which represents the lowest salary. Keep in mind that most of our waiters are part-time employees, so the waiter data was made by multiplying the hourly rate ($25) by 84 (the number of worked hours per month), while other positions' salary was generated by dividing their annual salary by 12.



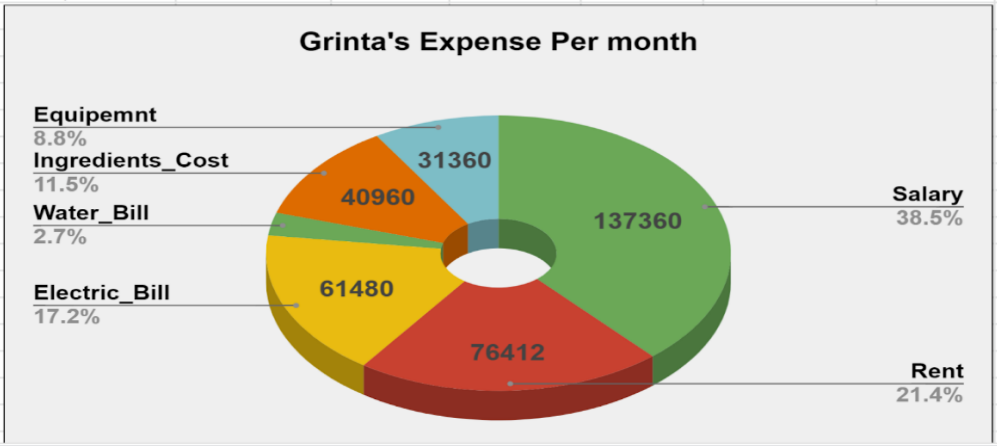
Above is a chart for Sales of Drinks VS Meals. Our data shows that the item that has the highest share of income is Lasagna Dish, while the lowest share is from Green Tea. This helps the restaurants' moderators to get some knowledge about the amount that each item shares in the restaurants' income.

	A	B	C	D
1	RevenueID	Dinein_Income	TakeOut_Income	GrintaID
2	2178	35560	25070	4152
3	7891	34560	26781	6721
4	4412	31762	24512	5471
5	4142	37881	23581	8182
6	7561	41982	21412	2175
7	Sum of revenue per Week	181745	121356	
8	Sum of revenue per Month	726980	485424	



The picture above shows and analyzes the restaurants' revenue per month. We multiplied the sum by four because this was weekly data, so we did this in order to get the monthly revenue. The data analysis shows that the restaurants make around 726980 per month from dining in, which makes around 60 percent of the restaurants' overall income, and about 485424 per month from taking out and delivering income, which makes about 40 percent of the restaurants' overall income.

	A	B	C	D	E	F	G	H
1	ExpenseID	Salary	Rent	Electric_Bill	Water_Bill	Ingredients_Cost	Equipment	GrintaID
2	44112	7000	4000	3000	500	2000	1500	4152
3	56712	6540	3670	2940	540	1500	1720	6721
4	68541	6300	3850	3150	480	2120	1910	5471
5	11341	7150	3591	3040	495	2400	1212	8182
6	21891	7350	3992	3240	390	2220	1498	2175
7	Sum of Bills per week	34340	19103	15370	2405	10240	7840	
8	Sum of Bills per month	137360	76412	61480	9620	40960	31360	



The picture above shows and analyze the restaurants' expense per month. Our data shows that with 38.5 percent of the overall expense, paying salaries is the most expensive that the restaurants spend in, while the lowest thing is the water bill with 2.7 percent of the overall expense. The data analysis also includes Equipment expenses, Electric bills expenses, Ingredients' expenses, and Rent expenses.

In the end, we would like to note that we did our best in designing and building the restaurant database. However, like any human work, it's not perfect, and it is possible to modify and add to it in the future in a way that makes the database even more organized and efficient. Here are some of our recommendations for the modifications that can make the database more efficient.

First, we can have a feedback table to collect feedback from our customers. We think that this will help improve the quality of the restaurant's service. The table will have a feedback id which will be the identifier for the feedback, and GrintaID and CustomerID as two foreign keys, which will identify which customer this feedback belongs to, and for which restaurant. The table can also have a column for giving the feedback, and another table for a rating on a scale of 1 to 5.

Second, we noticed that Pizza, Dish, Sandwich, and Side have many attributes in common. So, to prevent duplication, we can have a super-type table called Food, then we have Pizza, Dish, Sandwich Side, as sub-type tables which will inherit from Food table, same as we did with Employee and Customer. We believe that this will make the database more organized, and also if the restaurant wants to add even more categories of food in the future, this will make it easier to add them, because we'll no longer need to add these common attributes to each table, we just need to add the special attributes for each category.

Finally, We think we should have tables for keeping track of the number of items the restaurant has at the moment. For example, the restaurant has x amount of pepperoni, every time customers order a pepperoni pizza, which will consume some amount of pepperoni, the amount of pepperoni the restaurant has will decrease. This will allow us to keep track of the number of items we have so that if any item is about to finish, we can buy more of this item.