Good morning, thank you for (TA’s name) joining our demo. We’re excited to present what we came up with for this project.

In this project, we used **Python**as our programming language to build the web application. MySQL is the database we used for this project. Django is our main backend framework. Our frontend framework uses bootstrap.

To demo the web application, we type the command in the command prompt the python runserver command and it gives us this link. We can copy and paste it into the browser to launch the site. Our main menu interface includes 5 statistics, reporting area and the maintenance area. The basic 5 statistics are displayed here including count of stores offering childcare, count of products, count of distinct advertising campaigns, count of stores, count of stores offering food. These five statistics will help you to get a glance of the data and also as a checkpoint to make sure that the data is accurate before viewing reports. The following are 9 reports and 2 maintenance including population and holiday maintenance as required by the project spec. I’ll show you the reporting section first, and then the 2 maintenance.

Let’s go over to the reports.

Report 1 is the category report. The purpose of this report is to show a summary of the products in each category.

1. Its columns include category name, total number of products, Min & Average & Max retail prices of products.

2. All categories in the database including those without products are listed here, for example, pet furniture has no product associated with it, so it is showing 0 for the rest of the columns. And as the report shown, there are 30 categories in total in the database.

3. Lastly, this report is sorted by category name in ascending order.

5. Click the “Dashboard” at the top to return to the main menu.

Report 2 is the report about actual versus predicted revenue for couches and sofas. The purpose of this report is to predict whether offering items at a discount actually helps to increase revenue by encouraging a higher volume of sales. This report compares how much revenue was actually generated from a product’s sales versus if the product were never discounted.

1. This report is only for the products in the category of couches and sofas.

2. The columns in this table include product ID, name, retail price, total number of items sold, total number of items sold at discount price, total number of items sold at retail price, actual revenue, predicted revenue, and the difference between actual and predicted revenue.

3. Predicted revenue is a calculated field; it assumes that the product is never offered at a discount. It is calculated based on 75% of the original volume selling at a retail price on discounted days.

4. As required by the spec, the difference is calculated by subtracting predicted revenue from the actual revenue. Only differences greater than $5000 (either positive or negative) are displayed here and the report is sorted by differences in descending order.

5. From the results, there are 15 products from this category, we can see offering discount for these products can result in huge differences. If the difference is positive, it means that the actual revenue is higher, for example, on row 1, product 25244 has higher actual revenue and we are better off offering this product at the discounted price. If the difference is negative, it means that offering the product at regular price and selling at 75% of the sales volume is better. For most of the products listed here, offering discount cannot increase the revenue, but decrease the revenue. This is the report 2. Again, click “Dashboard” and return the main menu.

Report 3 is the store revenue by year by states report. This report will show the revenue collected by stores per state grouped by year.

1. States available for querying is displayed in the drop-down box. You can select a state and then click Run Report button. Note, here if you don’t select any state, run report button is disabled. Once we select a state and click the button, it goes to this table.

2. Columns include store ID, Store Address, city name, sales year and total revenue.

3. This report is sorted first by year in ascending order and then by revenue in descending order.

4. For the state of Arkansas, in the year 2000, you can see that store 299 has the highest sales revenue.

Report 4 presents outdoor furniture revenue on Groundhog Day. The goal of this report is to prove if the outdoor furniture sales spikes on Groundhog Day.

1. This report only queries for products in the category of outdoor furniture.

2. It returns the table with columns of year, total number of items sold, average number of items sold per day (calculated by total units sold/365…assuming 365 days), total number of items sold on Groundhog Day (Feb.2).

3. This report is sorted by year in ascending order.

4. From the results, we can see that for 7 out of 13 years, outdoor furniture sales are better on Groundhog Day than the daily average. But it is not the case for every single year, so we cannot say that Groundhog Day absolutely has sales spikes every year for outdoor furniture category.

Report 5 is the State with Highest Volume Report. This report will help you to know all stores in the states that sell the greatest number of units for each category.

1. This is a monthly report, so we need to select year and month first from this interface. If no selection, Run Report button is disabled. First we will pick a year to get the month list for that year and select the month to enable the button. If we reset the year, the month will be reset as well. Once we have both year and month selected, we can run the report.

Then, it returns this table with the category name, the states that sold the highest number of units in that category, and the number of units that were sold by stores in that state.

2. This table is sorted by category name in ascending order.

3. Note: This report queries for all categories. Each category will only be listed once unless there are more than one state with the highest sales units.

4. From the results, we can tell MT and MO both have the highest sales volume for Aquarium furniture category.

Regarding indices, we checked the common places like WHERE, JOIN, ORDER BY, etc. where indices become really helpful, and found out that all related columns are already indexed by MySQL. A double-check was done using the EXPLAIN statement, and it shows that all queries indeed use the indices. Thus, no additional index tuning was conducted.

(Optional part) If we pick a different month, it will take longer to run due to larger dataset but it can still finish in around 10 seconds.

Report 6 is the revenue by population report. This report will help you to forecast expansions into other cities, it lets us see what the total revenue is for specific population categories, and to see if there is a trend for revenue growth on an annual basis.

1. Each row represents a year, while each column represents a city size category. The categories are based on the population ranges as indicated in the column headers.

2. Both rows and columns are in ascending order, from the oldest to newest year and from smallest to largest city size categories.

3. From the results, we can see in most of the years, medium city size has higher revenue, compared with other city sizes. So, from that perspective, the LEOFURN furniture company should consider expansions into medium size cities. Also, with the increase of year, there is not a clear trend for growth for each city size categories.

4. One thing to note is that when population is updated in the Population Maintenance, the city size category in this report will also be updated simultaneously, which will result in different data.

Report 7 is the report about childcare sales volumes. This report will help you to understand how offering childcare has an impact on sales.

1. It returns all available sales data for the last 12 months and for each childcare time limit.

2. Columns are rendered dynamically to show all available childcare limits provided by stores including a column for stores with no childcare service. Each row represents a month in the last 12 months.

3. From the results, there is not a clear indication that providing more childcare will lead to higher sales volume. As we can see, during some months, providing no childcare brought in similar sales volume or even higher sales volume than providing childcare. 2012-04, 2012-05, 2012-06.

Report 8 is about the Restaurant Impact on Category Sales. According to the project spec, the purpose of this report is to help you to see if the presence of a restaurant can result in less sales in certain categories such as dining room furniture, while more sales in other categories such as beds, etc.

1. The columns here include category, store type, quantity sold. Categories are presented as grouped rows with store type separated into non-restaurant and restaurant.

2. This report is ordered by category name ascendingly, with non-restaurant store data listed first.

3. For the Store Type that has no quantity sold, 0 will be shown in the quantity sold column.

4. Note: any categories that are not assigned products is not included in this report as their information is not useful here.

5. For restaurant store type, wooden furniture and concrete furniture has the highest quantity sold while metal furniture has the lowest quantity sold. But there is not a huge disparity across different categories, most categories’ quantity sold are roughly around the same level. In conclusion, having a restaurant on site has a small impact to deviate quantity sold in different categories.

This is report 8, now let’s look at report 9.

(not part of script)….As shown here, for **all** categories, the sales volume for restaurant store type is roughly 4 times of the volume for non-restaurant store type. Note that this is from the perspective of the total quantity sold.

However, since the number of stores with and without restaurant are not at the same level, it’s fairer to estimate the average quantity sold per store in order to better evaluate the impact of a restaurant. So, we looked further into the data and found that the number of stores with restaurant (794) is roughly 4 times of the number of stores without a restaurant (206). Thus, from the perspective of the rough average quantity sold, the quantity is roughly the same for the two store types, and this is true for all categories. So, the presence of a restaurant doesn’t result in significant sales changes.

But from the perspective of total quantity sold, it is hard to tell if the presence of a restaurant contributes to a sales volume change.

Report 9 is advertising campaign analysis report. This report will help you to know whether an advertising campaign affects product sales volume if the product is discounted.

1. This report queries for all products, and when a discount price is in effect. For each product, we are showing product ID, product name, units sold during campaign, units sold outside campaign and the difference (the difference column is calculated by subtracting the sold outside campaign from the sold during campaign).

2. The results are sorted by difference in descending (highest to lowest) order. And only the top 10, followed by the bottom 10 from the results are shown in this report.

3. From the results, we can see for these products, advertising campaign has a positive effect on product sales volume when a discount price is in effect as there are significantly more discounted products sold during a campaign than outside of a campaign.

That wraps up report 9.

Overall, for all reports, if there are no data that meets the report criteria, we baked in a logic to show “No Records!” error message instead of the tables.

There are two maintenances: Population and holiday maintenance.

1. This is the population maintenance interface. As you can see, if there is no selection, update population button is disabled. You can select a state to get the city list and choose a city to show the corresponding population.

2. The update population button will only become enabled when you update the population to a different number.

Note: population length should be between 1 - 9 digits.

3. If at any time, you decide to change the selected state, then the city and population will be reset. If you change the city, then the population will be reset to reflect the correct population for that location. And the update button stays disabled until you change the population to a different number.

4. Once the update is successful, you will receive a success message at the bottom.

Click on the top and we go back to the dashboard.

Next, click on the holiday maintenance link:

1. It shows the holiday list with holiday date and holiday name. Note: A date can have multiple holiday names.

2. If you want to add holiday, you will click add holiday button. Similarly, if there is no selection, the add holiday button is disabled. You need to input Holiday Name and Select Holiday Date from DateTimePicker to enable the button.

A couple of things to note here: First, the Date Text box is read only and only supports the time picker to reduce the error handling cost. Secondly, if we enter a holiday that has already existed with the same name and same date, and you click on the add holiday button, it shows a warning message to remind you of this. For example: New Year’s Day 2012/1/1.

🡪Go back to the holiday list and you can see that it is not added.

Now, we can demo a success example for the same holiday date but different holiday name: New Holiday 2012/1/1

🡪Go back to the holiday list and you can see that it is added.

Add success example for a new date: April fool’s day 4/1/2021

And when we go back to holiday list you can see the holiday is added.

End~

That concludes all the functionalities in our application. Any questions? Again, thank you for joining us. We’ve learnt a lot from this course. Thanks! Have a good weekend……