

1.

a. Answer:

	Categorical	Discrete	Continuous
Categorical	Bar chart		
Discrete	Bar chart	Heatmap	
Continuous	Boxplot	Pair Plot	Pair Plot

b. Answer:

For the text comment and feedback, we can use Word Cloud and Slope Chart.

1. Word Cloud step: First step is data cleaning, we should check and remove the Null values, non-language characters (e.g., emoticons) values. Then split the text data and create text variable, then creating word cloud with the text as argument.
2. Slope Chart step: First we find the problem most people have reported from the word cloud analysis above. Then the same data cleaning. The most important step is choosing the separate time point, to mark different records as belonging to different time periods. Then we can draw the Slope Chart and analyze the changes based on the slope and the rank change of the line. We can use this analysis to find changes in user-reported issues.

c. Answer:

1. Tableau and Power BI are more user-friendly: user can create visualizations without using code but just drag and drop interface.
2. They are more integrated and compatible: Power BI's interface is similar to Excel's, both Power BI and Tableau can easily connect to many types of data source and database.
3. They have more convenient calculation and interaction functions. You can easily change the type of charts, change the color, add some calculate indicators into the graph. But if you use python, you have to change the code to achieve this.

d. Answer:

1. Browsing behavior data: We can learn the user's habits based on the user's browsing behavior, such as the functions they have frequently used recently and the products they have paid attention to for a long time. Customize the product interface, such as changing

the homepage entrance to commonly used functions and recommending services that users may be interested in.

2. Device and location information: We can modify the recommended functions based on the user's location, such as recommending credit card services and spending discounts when going abroad. If users open the app on a mobile phone, they are more likely to use the payment transfer function, and if they open it on a tablet, they may be more likely to check bills and make investments.
3. Customer Service and Feedback Records: By analyzing recent problems encountered by users and newly applied services, relevant modifications and recommendations can be made.

e. Answer:

1. Machine learning user analysis: By collecting users' personal information and behavioral data, such as work industry, age, consumption patterns, investment preferences, etc., a machine learning model is trained to estimate the probability of users participating in such savings plans.
2. User portrait: Through market analysis and research, identify the segments that are interested in such regular savings plans and then promote the plan to these customers.