### 1.

Question 1

A data analytics team works to recognize the current problem. Then, they organize available information to reveal gaps and opportunities. Finally, they identify the available options. These steps are part of what process?

**1 / 1 point**



Categorizing things



Using structured thinking



Making connections



Applying the SMART methodology

**Correct**

This describes structured thinking. Structured thinking begins with recognizing the current problem or situation. Next, information is organized to reveal gaps and opportunities. Finally, the available options are identified.

### 2.

Question 2

In which step of the data analysis process would an analyst ask questions such as, “What data errors might get in the way of my analysis?” or “How can I clean my data so the information I have is consistent?”

**1 / 1 point**



Analyze



Ask



Prepare



Process

**Correct**

An analyst asks questions such as, “What data errors might get in the way of my analysis?” or “How can I clean my data so the information I have is consistent?” during the process step. This is when data is cleaned in order to eliminate any possible errors, inaccuracies, or inconsistencies.

### 3.

Question 3

A data analyst has entered the analyze step of the data analysis process. Identify the questions they might ask during this phase. Select all that apply.

**1 / 1 point**



What is the question I’m trying to answer?



How can I create an engaging presentation to stakeholders?



How will my data help me solve this problem?

**Correct**

The analyze step involves thinking analytically about data. Data analysts might ask how the data can help them solve the problem and what story the data is trying to tell.



What story is my data telling me?

**Correct**

The analyze step involves thinking analytically about data. Data analysts might ask how the data can help them solve the problem and what story the data is trying to tell.

### 4.

Question 4

A data analyst is trying to understand what data to use to help solve a business problem. They’re asking questions such as, “What internal data is available in the database?” and “What outside facts do I need to research?” The data analyst is in which phase of the data analysis process?

**1 / 1 point**



Share



Ask



Prepare



Act

**Correct**

The data analyst is in the prepare step. This is when analysts consider what information to gather and what research they can do to help problem-solve.

In a previous video,

I shared how data analysis helped a company

figure out where to advertise its services.

An important part of this process

was strong problem-solving skills.

As a data analyst,

you'll find that problems are at the center

of what you do every single day,

but that's a good thing.

Think of problems as opportunities to put your skills to

work and find creative and insightful solutions.

Problems can be small or large,

simple or complex,

no problem is like another and they all require

a slightly different approach

but the first step is always the same:

Understanding what kind of problem you're trying to

solve and that's what we're going to talk about now.

Data analysts work with a variety of problems.

In this video, we're going to focus on six common types.

These include: making predictions, categorizing things,

spotting something unusual, identifying themes,

discovering connections, and finding patterns.

Let's define each of these now.

First, making predictions.

This problem type involves using data to make

an informed decision about

how things may be in the future.

For example, a hospital system might use

a remote patient monitoring to

predict health events for chronically ill patients.

The patients would take

their health vitals at home every day,

and that information combined with data about their age,

risk factors, and other important details could enable

the hospital's algorithm to predict

future health problems and

even reduce future hospitalizations.

The next problem type is categorizing things.

This means assigning information to

different groups or clusters based on common features.

An example of this problem type is

a manufacturer that reviews data on

shop floor employee performance.

An analyst may create a group for employees

who are most and least effective at engineering.

A group for employees who are most and least

effective at repair and maintenance,

most and least effective at assembly,

and many more groups or clusters.

Next, we have spotting something unusual.

In this problem type,

data analysts identify data

that is different from the norm.

An instance of spotting something

unusual in the real world is

a school system that has

a sudden increase in the number of students registered,

maybe as big as

a 30 percent jump in the number of students.

A data analyst might look into

this upswing and discover that

several new apartment complexes had been

built in the school district earlier that year.

They could use this analysis to make sure the school has

enough resources to handle the additional students.

Identifying themes is the next problem type.

Identifying themes takes categorization as a step

further by grouping information into broader concepts.

Going back to our manufacturer that has just

reviewed data on the shop floor employees.

First, these people are grouped by types and tasks.

But now a data analyst could

take those categories and group them into

the broader concept of

low productivity and high productivity.

This would make it possible for the business to

see who is most and least productive,

in order to reward top performers and

provide additional support to

those workers who need more training.

Now, the problem type of discovering connections enables

data analysts to find

similar challenges faced by different entities,

and then combine data and insights to address them.

Here's what I mean;

say a scooter company is experiencing

an issue with the wheels it gets from its wheel supplier.

That company would have to stop production until it could

get safe, quality wheels back in stock.

But meanwhile, the wheel companies encountering

the problem with the rubber it uses to make wheels,

turns out its rubber supplier could

not find the right materials either.

If all of these entities could talk about

the problems they're facing and share data openly,

they would find a lot of

similar challenges and better yet,

be able to collaborate to find a solution.

The final problem type is finding patterns.

Data analysts use data to find

patterns by using historical data to

understand what happened in

the past and is therefore likely to happen again.

Ecommerce companies use data to

find patterns all the time.

Data analysts look at transaction data to understand

customer buying habits at

certain points in time throughout the year.

They may find that customers buy more

canned goods right before a hurricane,

or they purchase fewer cold-weather accessories

like hats and gloves during warmer months.

The ecommerce companies can

use these insights to make sure

they stock the right amount of

products at these key times.

Alright, you've now learned six basic problem types

that data analysts typically face.

As a future data analyst,

this is going to be valuable knowledge for your career.

Coming up, we'll talk a bit more

about these problem types and I'll

provide even more examples of them

being solved by data analysts.

Personally, I love real-world examples.

They really help me better understand new concepts.

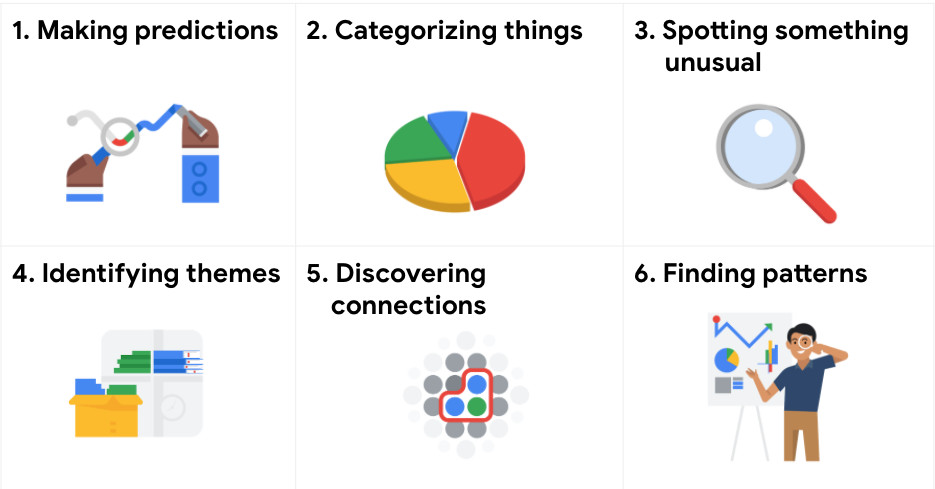
I can't wait to share

even more actual cases with you. See you there.

# **Six problem types**

Data analytics is so much more than just plugging information into a platform to find insights. It is about solving problems. To get to the root of these problems and find practical solutions, there are lots of opportunities for creative thinking. No matter the problem, the first and most important step is understanding it. From there, it is good to take a problem-solver approach to your analysis to help you decide what information needs to be included, how you can transform the data, and how the data will be used.

## Data analysts typically work with six problem types

1. Making predictions 2. Categorizing things 3. Spotting something unusual 4. Identifying themes 5. Discovering connections 6. Finding patterns

A video, [Common problem types](https://www.coursera.org/learn/ask-questions-make-decisions/lecture/E8HxZ/common-problem-types), introduced the six problem types with an example for each. The examples are summarized below for review.

### **Making predictions**

A company that wants to know the best advertising method to bring in new customers is an example of a problem requiring analysts to make predictions. Analysts with data on location, type of media, and number of new customers acquired as a result of past ads can't guarantee future results, but they can help predict the best placement of advertising to reach the target audience.

### **Categorizing things**

An example of a problem requiring analysts to categorize things is a company's goal to improve customer satisfaction. Analysts might classify customer service calls based on certain keywords or scores. This could help identify top-performing customer service representatives or help correlate certain actions taken with higher customer satisfaction scores.

### **Spotting something unusual**

A company that sells smart watches that help people monitor their health would be interested in designing their software to spot something unusual. Analysts who have analyzed aggregated health data can help product developers determine the right algorithms to spot and set off alarms when certain data doesn't trend normally.

### **Identifying themes**

User experience (UX) designers might rely on analysts to analyze user interaction data. Similar to problems that require analysts to categorize things, usability improvement projects might require analysts to identify themes to help prioritize the right product features for improvement. Themes are most often used to help researchers explore certain aspects of data. In a user study, user beliefs, practices, and needs are examples of themes.

By now you might be wondering if there is a difference between categorizing things and identifying themes. The best way to think about it is: categorizing things involves assigning items to categories; identifying themes takes those categories a step further by grouping them into broader themes.

### **Discovering connections**

A third-party logistics company working with another company to get shipments delivered to customers on time is a problem requiring analysts to discover connections. By analyzing the wait times at shipping hubs, analysts can determine the appropriate schedule changes to increase the number of on-time deliveries.

### **Finding patterns**

Minimizing downtime caused by machine failure is an example of a problem requiring analysts to find patterns in data. For example, by analyzing maintenance data, they might discover that most failures happen if regular maintenance is delayed by more than a 15-day window.

## Key takeaway

As you move through this program, you will develop a sharper eye for problems and you will practice thinking through the problem types when you begin your analysis. This method of problem solving will help you figure out solutions that meet the needs of all stakeholders.

You've been learning about six common problem types of data analysts encounter,

making predictions, categorizing things, spotting something unusual,

identifying themes, discovering connections, and finding patterns.

Let's think back to our real world example from a previous video.

In that example,

anywhere gaming repair wanted to figure out how to bring in new customers.

So the problem was, how to determine the best advertising method for

anywhere gaming repair's target audience.

To help solve this problem, the company used data to envision

what would happen if it advertised in different places.

Now nobody can see the future but the data helped them make an informed

decision about how things would likely work out.

So, their problem type was making predictions.

Now let's think about the second problem type, categorizing things.

Here's an example of a problem that involves categorization.

Let's say a business wants to improve its customer satisfaction levels.

Data analysts could review recorded calls to the company's customer

service department and evaluate the satisfaction levels of each caller.

They could identify certain key words or phrases that come up during

the phone calls and then assign them to categories such as politeness,

satisfaction, dissatisfaction, empathy, and more.

Categorizing these key words gives us data that lets the company

identify top performing customer service representatives, and

those who might need more coaching.

This leads to happier customers and higher customer service scores.

Okay, now let's talk about a problem that involves spotting something unusual.

Some of you may have a smart watch, my favorite app is for health tracking.

These apps can help people stay healthy by collecting data such as their heart rate,

sleep patterns, exercise routine, and much more.

There are many stories out there about health apps actually saving

people's lives.

One is about a woman who was young, athletic, and

had no previous medical problems.

One night she heard a beep on her smartwatch,

a notification said her heart rate had spiked.

Now in this example think of the watch as a data analyst.

The watch was collecting and analyzing health data.

So when her resting heart rate was suddenly 120 beats per minute,

the watch spotted something unusual because according to its data,

the rate was normally around 70.

Thanks to the data her smart watch gave her, the woman went to the hospital and

discovered she had a condition which could have led to life threatening

complications if she hadn't gotten medical help.

Now let's move on to the next type of problem: identifying themes.

We see a lot of examples of this in the user experience field.

User experience designers study and

work to improve the interactions people have with products they use every day.

Let's say a user experience designer wants to see what customers think about

the coffee maker his company manufactures.

This business collects anonymous survey data from users,

which can be used to answer this question.

But first to make sense of it all,

he will need to find themes that represent the most valuable data,

especially information he can use to make the user experience even better.

So the problem the user experience designer's company faces,

is how to improve the user experience for its coffee makers.

The process here is kind of like finding categories for

keywords and phrases in customer service conversations.

But identifying themes goes even further by grouping each insight into

a broader theme.

Then the designer can pinpoint the themes that are most common.

In this case he learned users often couldn't tell if the coffee maker

was on or off.

He ended up optimizing the design with improved placement and lighting for

the on/off button, leading to the product improvement and happier users.

Now we come to the problem of discovering connections.

This example is from the transportation industry and

uses something called third party logistics.

Third party logistics partners help businesses ship products when

they don't have their own trucks, planes or ships.

A common problem these partners face is figuring out how to reduce wait time.

Wait time happens when a truck driver from the third party logistics provider

arrives to pick up a shipment but it's not ready.

So she has to wait.

That costs both companies time and money and

it stops trucks from getting back on the road to make more deliveries.

So how can they solve this?

Well, by sharing data the partner companies can view each other's timelines

and see what's causing shipments to run late.

Then they can figure out how to avoid those problems in the future.

So a problem for one business doesn't cause a negative impact for the other.

For example, if shipments are running late because one company only delivers Mondays,

Wednesdays and Fridays, and the other company only delivers Tuesdays and

Thursdays, then the companies can choose to deliver on the same day to reduce

wait time for customers.

All right, we've come to our final problem type, finding patterns.

Oil and gas companies are constantly working to keep their machines running

properly.

So the problem is, how to stop machines from breaking down.

One way data analysts can do this is by looking at patterns

in the company's historical data.

For example, they could investigate how and when a particular machine

broke down in the past and then generate insights into what led to the breakage.

In this case, the company saw pattern indicating that machines began breaking

down at faster rates when maintenance wasn't kept up in 15 day cycles.

They can then keep track of current conditions and

intervene if any of these issues happen again.

Pretty cool, right?

I'm always amazed to hear about how data helps real people and

businesses make meaningful change.

I hope you are too.

See you soon.

A data analyst identifies and classifies keywords from customer reviews to improve customer satisfaction. This is an example of which problem type?

**1 / 1 point**



Categorizing things



Finding patterns



Making predictions



Spotting something unusual

**Correct**

A data analyst identifying and classifying keywords from customer reviews to improve customer satisfaction is an example of categorizing things.

### 2.

Question 2

The spotting something unusual problem type could involve which of the following scenarios?

**1 / 1 point**



A data insight helps a landscaping company envision what will happen in the future.



A data analyst working for an agricultural company examines why a dataset has a surprising and rare data point.



A data analyst at a clothing retailer creates a list of common topics, categorizes them, and groups each category into a broader subject area for further analysis.



A data analyst at an arts nonprofit classifies similar data points into groups for further analysis.

**Correct**

The problem type of spotting something unusual could involve a data analyst examining why a dataset has a surprising and rare data point. Spotting something unusual deals with identifying and analyzing something out of the ordinary.

### 3.

Question 3

A data analyst at an online retailer works with historical sales data. The analyst identifies repeating trends in the sales data. This is an example of which problem type?

**1 / 1 point**



Identifying themes



Making predictions



Finding patterns



Categorizing things

**Correct**

This is an example of finding patterns. Finding patterns deals with identifying trends in a data set.