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Apps

Introduction to the Internet of Things

Chapter 3 Everything Generates Data ▶ 3.1 Big Data ▶ 3.1.3 Supporting Business with Big Data ▶ 3.1.3.4 Chart Types

Chart Types

The image displays a variety of data visualization charts. At the top left is a line chart with multiple colored lines. In the center is a large pie chart divided into four segments. To the right is a scatter plot on a laptop screen. At the bottom left is a 3D bar chart with four bars of increasing height. At the bottom right is a dashboard-style chart with multiple small bar charts.

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Apps

Introduction to the Internet of Things

Chapter 3
Everything Generates Data

3.1
Big Data

3.1.3
Supporting Business with Big Data

3.1.3.6
Analyzing Big Data for Effective Use in Business

Open for Innovation
KNIME

Refine OPEN
A free, open source, powerful tool for working with messy data

rapidminer

orange

Analyzing Big Data for Effective Use in Business

Big data is just that – BIG! It is most useful if you can analyze it to get value out of it. Data analysis is the process of inspecting, cleaning, transforming, and modeling data to uncover useful information. Analyzing big data typically requires tools and applications created for this purpose. These analysis tools have been designed to provide businesses with detailed information, patterns, and valuable insights.

Before beginning any analysis, it is critical to know what problem the business is trying to solve or what information the business is looking for. Are they interested in customer behavior in specific states, energy consumption patterns in different city quadrants, or the number of Facebook "likes" based on age?

Having a strategy helps a business determine the type of analysis required and the best tool

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Introduction to the Internet of Things

Chapter 4 Everything Can Be Automated

4.1 What Can Be Automated?

4.1.1 Automation

4.1.1.1 What is Automation?



Tampa, Florida

What is Automation?

Automation is any process that is self-driven and reduces, then eventually eliminates, the need for human intervention.

Automation was once confined to the manufacturing industry. Highly repetitive tasks such as automobile assembly were turned over to machines and the modern assembly line was born. Machines are excellent at repeating the same task without fatigue and without the errors that humans are prone to make in such jobs. This results in greater output, because machines can work 24 hours a day without breaks. Machines also provide a more uniform product.

The IoT opens up a new world in which tasks previously requiring human intervention can become automated. As we have seen, the IoT allows the collection of vast amounts of data that can be quickly analyzed to provide

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Apps

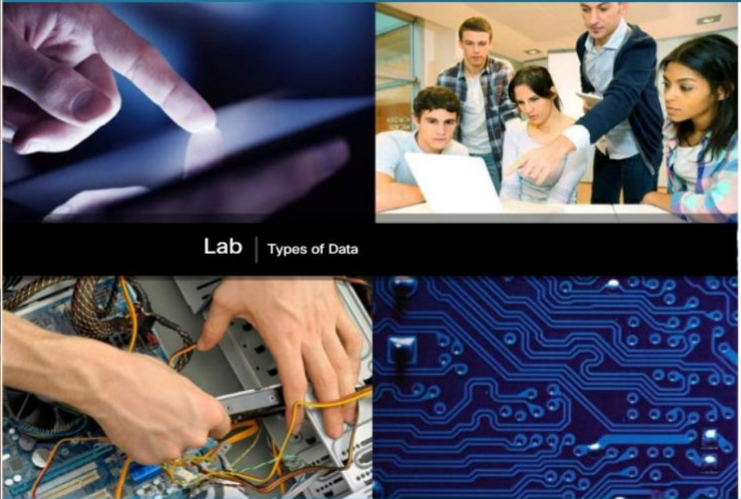
Introduction to the Internet of Things

Chapter 5 Everything Needs to be Secured

5.1 Security in the Digitized World

5.1.1 Why is Security so Important?

5.1.1.2 Lab - Types of Data



Lab | Types of Data

Lab - Types of Data

In this lab, we will review different types of collected data and determine if it is sensitive in nature and who might benefit from stealing it.

Lab - Types of Data

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What is the IoT?

The Internet of Things (IoT) is the connection of millions of smart devices and sensors connected to the Internet. These connected devices and sensors collect and share data for use and evaluation by many organizations. These organizations include businesses, cities, governments, hospitals, and individuals. The IoT has been possible, in part, due to the advent of cheap processors and wireless networks. Previously, inanimate objects such as door knobs or light bulbs cannot be equipped with an intelligent sensor that can collect and transfer data to a network.

Packet Tracer - Blinking an LED Using Blockly

Cisco Packet Tracer has incorporated Blockly as one of the programming languages available in its IoT functionality. In this lab, you will control the blink rate of an LED using Blockly code.

What is Python?

Python is a very popular language that is designed to be easy to read and write. Python's developer community adds value to the language by creating all types of modules and making them available to other programmers.

The core philosophy of the language is summarized by the document [The Zen of Python](#):

- Beautiful is better than ugly
- Explicit is better than implicit
- Simple is better than complex
- Complex is better than complicated
- Readability counts

Despite the fact Python is designed to be easy, there is still a learning curve. To make it easier to learn Python, a beginner can use Blockly to enhance his or her Python understanding.

While different programming languages have different semantics and syntax, they all share the same programming logic. Beginners can use Blockly to easily create a language-independent program, export it as Python code, and use this newly created code to learn about Python syntax, structure, and semantics.





Edit with WPS Office

Python supports many useful functions and data types. Some of the more important ones are as follows:

Range()

The `range()` function generates a list of numbers usually used to iterate with `FOR` loops.

Figure 1 shows examples of the `range()` function.

- `Range(stop)`—This is the number of integers (whole numbers) to generate, starting from zero.
- `Range([start], stop[, step])`—This is the starting number of the sequence, the ending number in the sequence, and the difference between each number in the sequence.

Tuples

A tuple is a sequence of unchangeable Python objects. Tuples are sequences, separated by parentheses. Figure 2 shows examples of tuples.

Lists

Lists are a sequence of changeable Python objects. Lists can be created by putting different comma-separated values between square brackets. Figure 3 shows examples of lists and how they can be updated.

Sets

Sets are unordered collections of unique elements. Common uses include membership testing, removing duplicates from a sequence, and computing standard math operations on sets such as intersection, union, difference, and symmetric difference. Figure 4 shows examples of sets.

Dictionary

A dictionary is a list of elements that are separated by commas. Each element is a combination of a value and a unique key. Each key is separated from its value by a colon. The entire dictionary is written within braces. Dictionary elements can be accessed, updated, and deleted. There are also many built-in dictionary functions such as a function that compares elements with different dictionaries and another that provides a count of the total number of elements within a dictionary. Figure 5 shows examples of dictionaries.

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The IoT opens up a new world in which tasks previously requiring human intervention can become automated. As we have seen, the IoT allows the collection of vast amounts of data that can be quickly analyzed to provide information that can help guide an event or process.

As we continue to embrace the benefits of the IoT, automation becomes increasingly important. Access to huge amounts of quickly processed sensor data started people thinking about how to apply the concepts of machine learning and automation to everyday tasks. Many routine tasks are being automated to improve their accuracy and efficiency.

Automation is often tied to the field of robotics. Robots are used in dangerous conditions such as mining, firefighting, and cleaning up industrial accidents, reducing the risk to humans. They are also used in such tasks as automated assembly lines.

We now see automation everywhere, from self-serve checkouts at stores and automatic building environmental controls, to autonomous cars and planes. How many automated systems do you encounter in a single day?

