DAILY ASSESSMENT FORMAT

Date:	09-07-2020	Name:	YAMUNASHREE N
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Introduction to the Internet of Things

Networking
CISCO Academy

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

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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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Introduction to the Internet of Things

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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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Edit with WPS Office

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 doorknobs or light bulbs can now 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 blocky 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 Blackly 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.

Python supports many useful functions and datatypes. 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 within 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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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.s