SESSION 1

Python Fundamentals and using the AWS BOTO3 SDK

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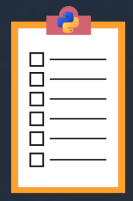
Session 1 Overview

1 Python History

2 Lists

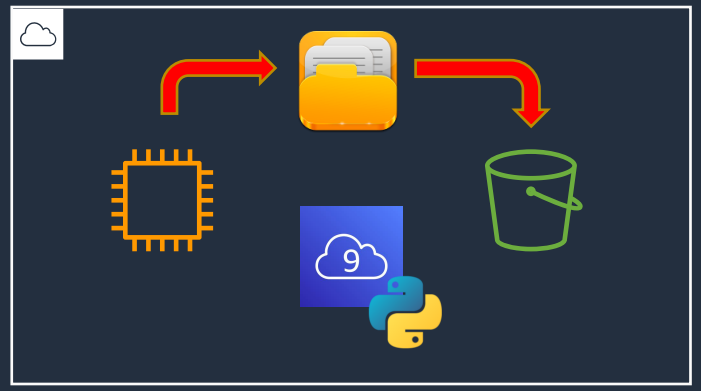


4 Conditional Statements

3 For Loops

5 Boto3

6 Hands-on Exercise



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Python's History

Guido van Rossum

CWI

Centrum Wiskunde & Informatica

- Conceived of in the late 80's
- 1989, implementation began at CWI in the Netherlands
- 1991, the beta release of Python (version 0.9.0)
- 1994, Python reached version 1.0
- 2000, Python 2.0 was released
- 2008, Python 3.0 was released

1989

1991

Adoption by tech companies like:

Internal systems, web search, machine learning, YouTube

Flask

To build its backend services, Flask

Designed with a focus on:

- Simplicity, readability and ease of use
- Python's core philosophy (PEP 20 - The Zen of Python)

20

A vibrant and supportive community

- Resources for learning
- Large contributing community
- Regular Conferences
- An event for the Python community to share ideas and learn from each other. (tutorials, job fair, sprints)

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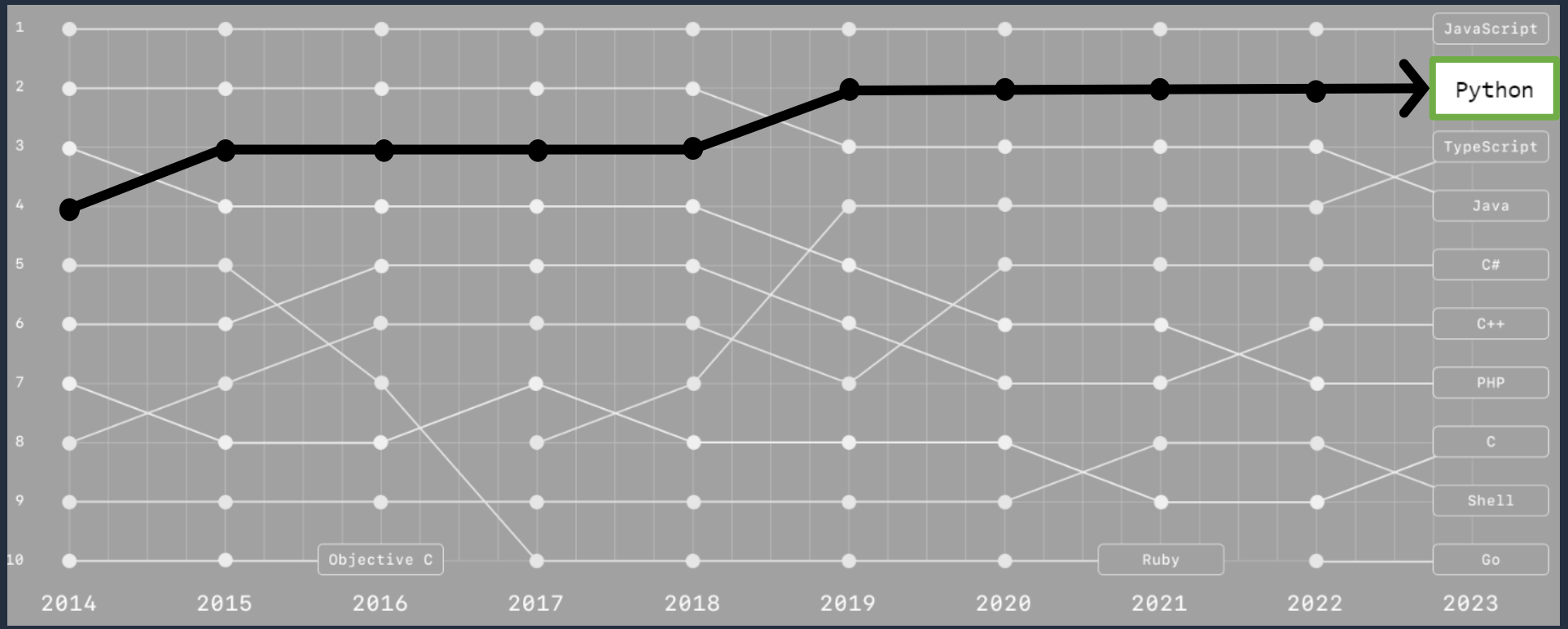
Top languages used in 2023

- According to GitHub, developers used almost 500 primary languages to build software on GitHub.
- Python held steady in the 2nd place position over the past year in large part due to its versatility in everything from development to education to machine learning and data science.



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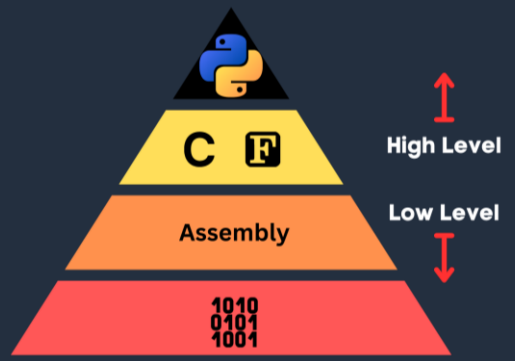
Pre-Module Lessons

Python



AWS Cloud9

```python
# This is a comment
item_name = 'banana'

quantity = 5

discount_rate = 0.1
item_price = 2 # USD

subtotal = item_price * quantity
discount = subtotal * discount_rate

print(f"Discount for {item_name}: {discount}.")
```

Fundamentals

1

Comment for yourself and others.

2

Think of variables as containers.

3

Data Types

4

Operators

5

Print Function

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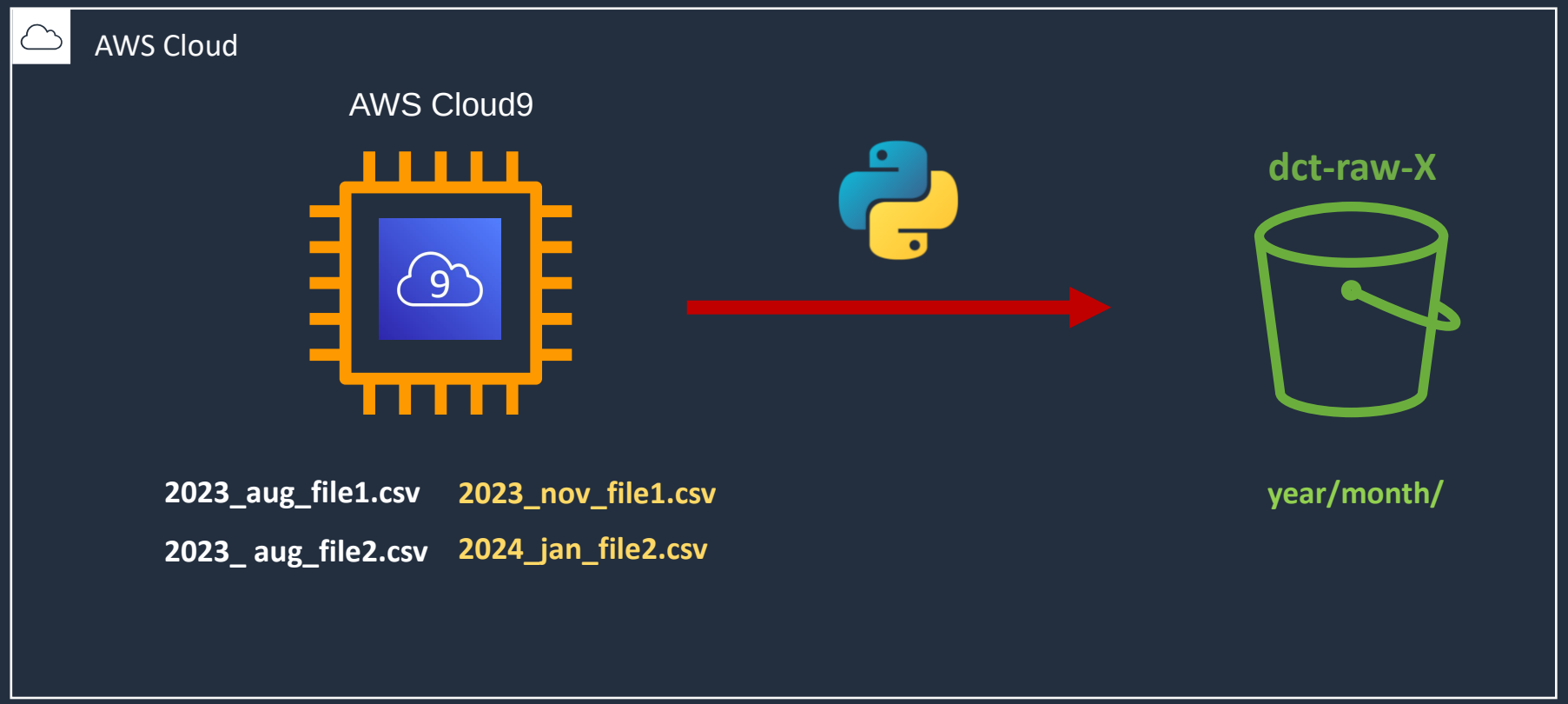
Hands-on Exercise: Extract Files from Source System and Push them into S3



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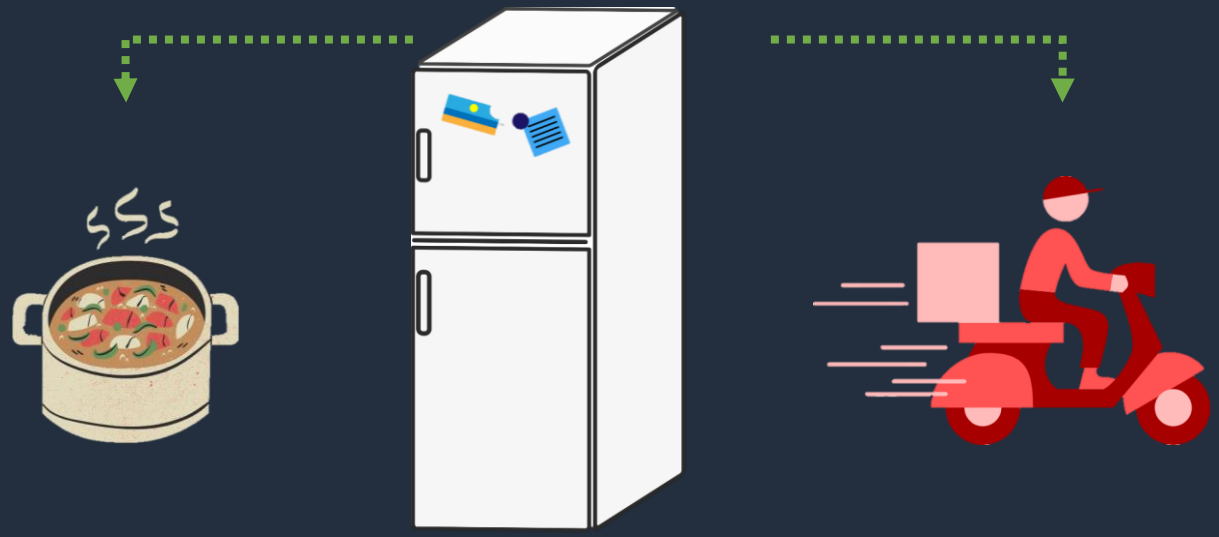
Conditional Statements

- A piece of code that executes instructions based on a particular state
- Useful for:
  - Controlling the flow of a program
  - Executing different code based on different conditions



- In a Python program, the if statement is how you perform this sort of decision-making

```
1  empty = True
2  print(f"Is the fridge empty? {empty}")
3
4  if empty:
5      order_takeout()
6  else:
7      ingredients = get_ingredients()
8      cook(ingredients)
9
10 # Eat food
```

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Lists

What are lists and why use them?

- An ordered collection of items.
- Lists are mutable.
- Especially useful when you need to work with a collection of related items.
- Containers that help you store and manage multiple pieces of data that can be of different data types.
- Think of a list as a grocery shopping list.

```
1 shopping_list = [
2     'eggs', 'flour', 3.14159, 'onion', 'mushrooms'
3     ]
```

How to work with lists:

- Creating a list `shopping_list = []`
- Accessing list elements `first_item = shopping_list[0]`
- Modifying list elements `shopping_list[2] = 3.14159`
- Adding and removing elements

```
shopping_list.append("hot sauce")
```

```
shopping_list.pop()
```

- List length

```
length_list = len(shopping_list)
```

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10 Minute Break

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AWS Boto3 SDK

An SDK (Software Development Kit) contains a set of preconfigured tools and libraries

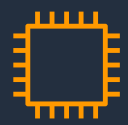
Boto3 allows us to write Python code that interacts with AWS services

Boto3 contains easy-to-use APIs to many AWS services, including:

automation

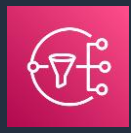
S3

EC2



RDS

SNS



upload_file()

create_snapshot()

execute_statement()

publish()

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AWS Boto3 SDK Cont.

Resource Method

- Higher-level, object-oriented API
- Represents AWS service objects (e.g., S3 bucket, EC2 instance)
- Allows actions directly on objects
- Use when you prefer a more Pythonic and concise interface

Client Method

- Use when you need fine-grained control and access to all available operations

To call operations on the **Resource** method, use an action.

```
s3_resource.create_bucket(
    ACL='private'|'public-read'|'public-read-write'|'authenticated-read',
    Bucket='string',
    CreateBucketConfiguration={
        'LocationConstraint': 'ap-east-1'|'eu-south-1'|'sa-east-1'|'us-east-2'|
    },
    GrantFullControl='string',
    GrantRead='string',
    GrantReadACP='string',
    GrantWrite='string',
    GrantWriteACP='string',
    ObjectLockEnabledForBucket=True|False,
    ObjectOwnership='BucketOwnerPreferred'|'ObjectWriter'|'BucketOwnerEnforced'
)
```

create_bucket() delete()

upload_file()

put_object() copy()

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For Loop

Definite iteration - The number of repetitions is specified explicitly in advance.

- Iteration – The repeated execution of a block of code.
- Python uses collection-based iteration.

```
1  ingredients = ['spinach', 'cheese', 'onions', 'mushrooms']
2
3  # Use a for loop to iterate through the list of ingredients
4  for ingredient in ingredients:
5      print(f"Adding {ingredient} to the recipe.")
```

The ingredient variable assumes the value of the ingredients list elements one at a time until the loop runs out of list elements, or the loop is prematurely broken.

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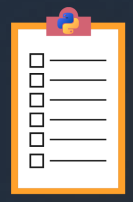
Conclusion – Session 1 Topics

1 Python History

2 Lists



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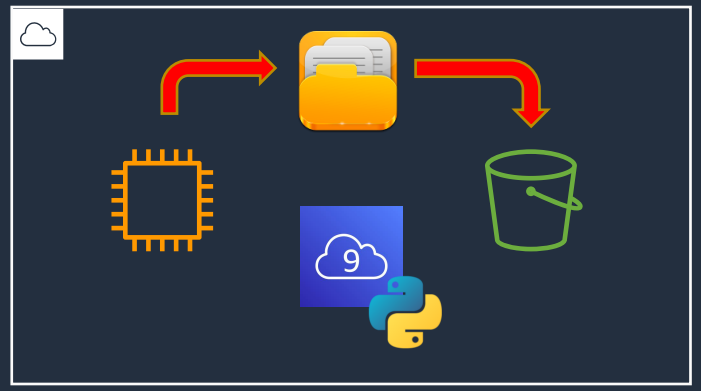

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Homework Session 1

Videos:

- Conditional Statements
- YouTube video on AWS Cloudformation

Hands-on:

Add an if condition in your for-loop so that only files with a '.csv' extension are uploaded to S3.

- os.path.splitext() function: documentation

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S2 Preview : The AWS Cloud Development Kit and Python

1 Dictionaries

2 AWS CDK

3 Functions

5 Two Hands-on Exercises

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Final Questions?

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