

Describe Cloud Concepts - AZURE FUNDAMENTALS

**Introduction to Cloud technologies
& AZ-900 certification preparation**

Introduction

Steven VINCENT - Burgundy School of Business -
Oct. 2023 -

Professional Experience



Digital Marketing intern
Akor Consulting
2018



Data Engineer
PwC Luxembourg
06.2020 - 03.2022



Data Engineer
Société Générale
03.2022 - Now

The Different Data Roles

Data Analyst

In charge of building dashboards and analysis

ML Engineer

In charge of building machine learning pipelines

Data Engineer

In charge of developing Big data ETL data pipelines and data acquisition

BI Engineer

In charge of Data Warehouse, views, reports (Low Code ETL development)

Data Scientist

In charge of building predictions models and getting data insights

Data Architect

In charge of choosing and improving the data infrastructure

DataOps Engineer

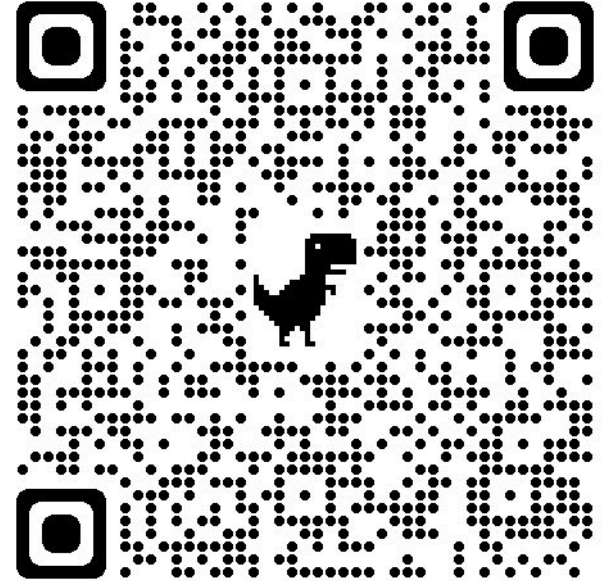
In charge of data change management (CI/CD, Devops, release)

Installation

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Environment setup

<https://steven-vcnt.github.io/Steven-Vcnt/BSB%20Courses/0.installation/>

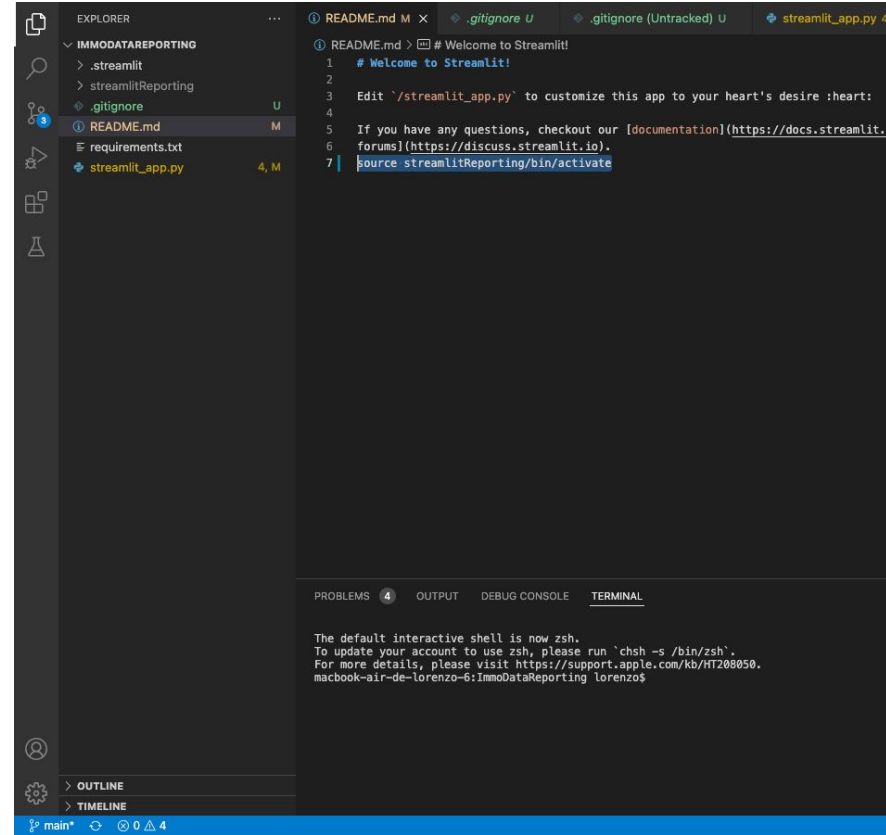


Install Visual Studio Code

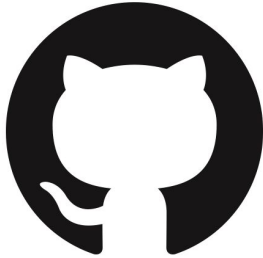


Visual Studio Code is an IDE developed by Microsoft which aims you to program in different languages like Python.

[Visual Studio Code – Code Editor | Microsoft Azure](#)

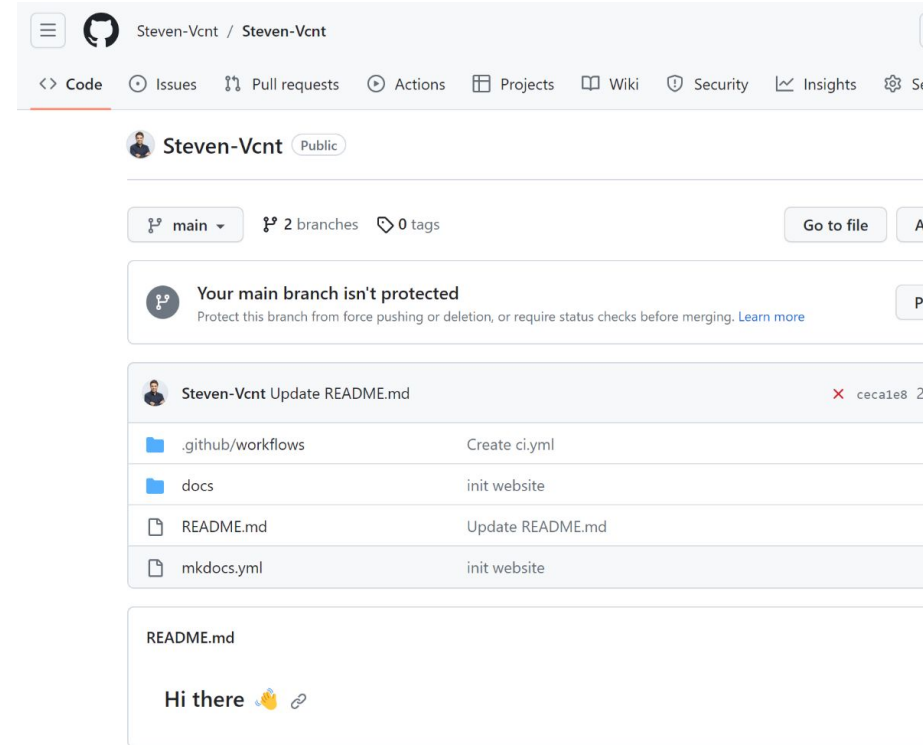


Create your GitHub Account

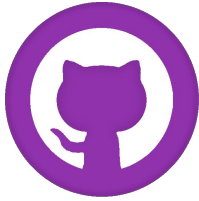


GitHub is a platform for software development and version control using Git, allowing developers to store and manage their code.

[GitHub](https://github.com)

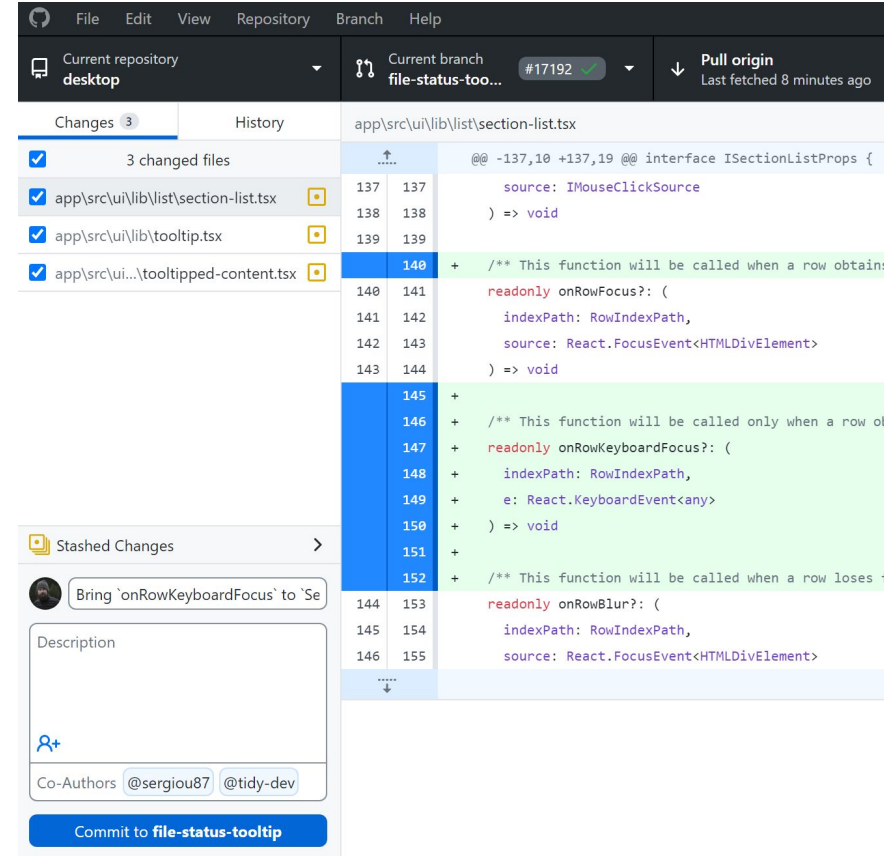


Install GitHub Desktop



GitHub Desktop aims to facilitate the use of Github and manage easily your repositories, commits, branches.

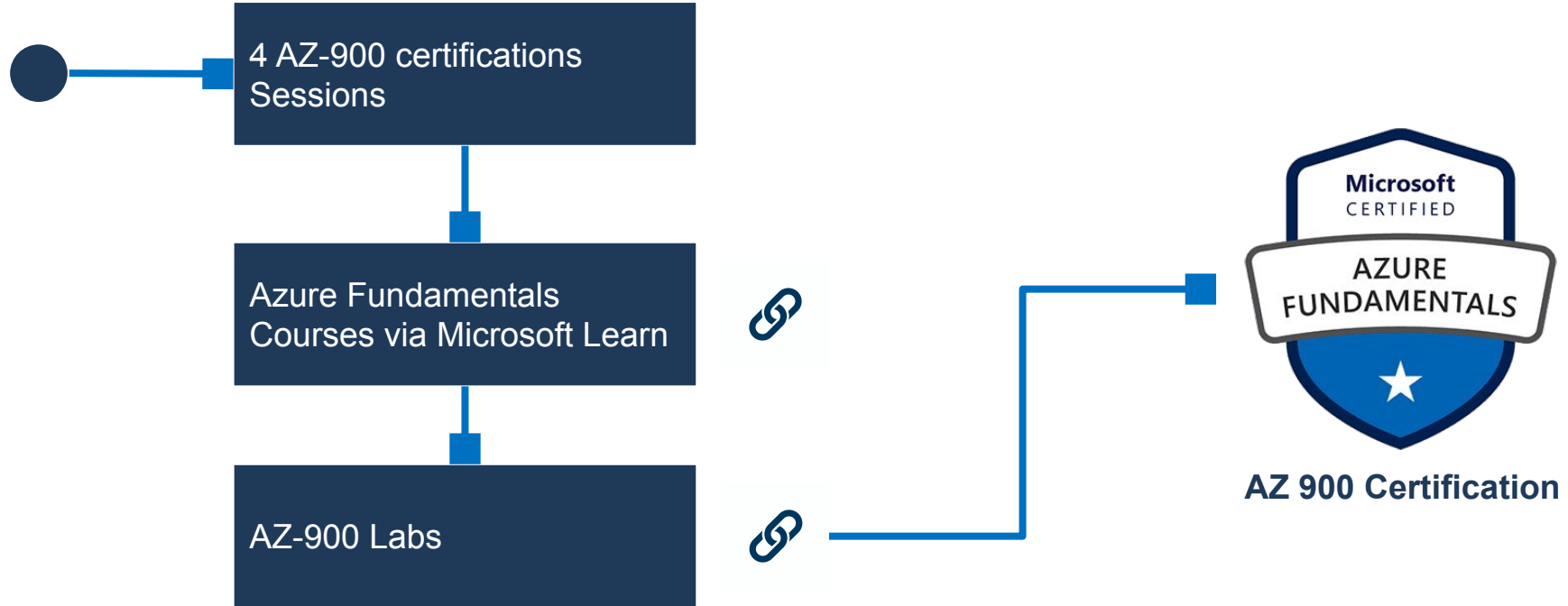
[GitHub Desktop](#)



Azure Certification introduction - AZ 900

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AZ 900 Azure Fundamentals



Skills measured

Demonstrating your knowledge of cloud concepts, models, and services and showing your expertise in Azure.

AZ-900 Domain Area	Weight
Describe cloud concepts	25-30%
Describe Azure architecture and services	35-40%
Describe Azure management and governance	30-35%

Benefits of azure certifications

- Showcase that you understand the fundamentals of Azure (LinkedIn, Resume)
- Official Certification from Azure
- Certification is worth 100\$
- Once passed, you can renew for free your certification and stay updated on changes and new technologies

Licenses & certifications



Microsoft Certified: Azure Data Engineer Associate

Microsoft

Issued Oct 2021 · Expired Oct 2022

Credential ID 1001-2372

Show credential [↗](#)

How to read the exam study guide

Describe cloud concepts (25–30%)

Describe cloud computing

- Define cloud computing
- Describe the shared responsibility model
- Define cloud models, including public, private, and hybrid
- Identify appropriate use cases for each cloud model
- Describe the consumption-based model
- Compare cloud pricing models

Functional group (skill set)

Objective (specific skill)

May include topics: You should be able to perform each of these before taking the exam

Exam basics

How to pass the exam?

- Scores are reported on a scale of 1 to 1000.
- You need a passing score of 700 or greater
- 700 may not equal 70% of the points

How many questions?

- 35 to 50 questions
- Questions may be worth more than 1 point depending on the difficulty of the question
- Go with your gut and don't overthink
- Answer all the questions as there is no penalty for guessing
- You can mark items for review and take another look, some questions cannot be revisited

How much time?

- 65 minutes: 45 minutes to answer questions and 20 minutes for miscellaneous

What type of question?

- It is more than just multiple-choice questions
 - Build list
 - Hot area
 - Active screen
 - Drag and drop

Answer every question!

Question example

Item Stem

Technical Environment	
Business Plan / Problem	
Goal Statement	You need to ensure that you are monitoring cost consumption of Azure usage.
Question Statement	What tool should you use?

Item Options

Option A	Resource monitor
Option B	Pricing calculator
Option C	Budget alerts
Option D	

Exam Sandbox



Exam AA-001_Sandbox

AA-001_Sandbox

Welcome !

Maximum time for this session, including instructions, survey, and exam: 8 hours

Number of exam questions: 10

Number of case studies: 1

Maximum time for exam: 8 hours

Minimum score required to pass this exam: 700



Color Scheme



Next

Describe cloud concepts

Chapter study guide

Describe cloud concepts (25–30%)

Describe cloud computing

- Define cloud computing
- Describe the shared responsibility model
- Define cloud models, including public, private, and hybrid
- Identify appropriate use cases for each cloud model
- Describe the consumption-based model
- Compare cloud pricing models

Describe the benefits of using cloud services

- Describe the benefits of high availability and scalability in the cloud
- Describe the benefits of reliability and predictability in the cloud
- Describe the benefits of security and governance in the cloud
- Describe the benefits of manageability in the cloud

Describe cloud service types

- Describe infrastructure as a service (IaaS)
- Describe platform as a service (PaaS)
- Describe software as a service (SaaS)
- Identify appropriate use cases for each cloud service (IaaS, PaaS, SaaS)

CLOUD COMPUTING

Cloud computing components & key characteristics

Cloud components:



Computing power



Storage



Networking



Artificial
Intelligence



IoT (Internet
of Things)

Key characteristics:

Scalability

Elasticity

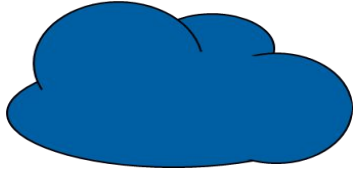
Agility

Fault tolerance

Disaster recovery

High availability

Main types of cloud computing



Public Cloud
Cloud computing delivered
via internet and shared
across organizations



Hybrid Cloud
Cloud computing using
private and public cloud



Private Cloud
Cloud computing dedicated
to your organization



Multi-Cloud
Use of different Public Cloud
in the same time (AWS -
Azure)

On-premise vs Cloud Infrastructure



Cost



Global Scale



Security



Performance



Speed

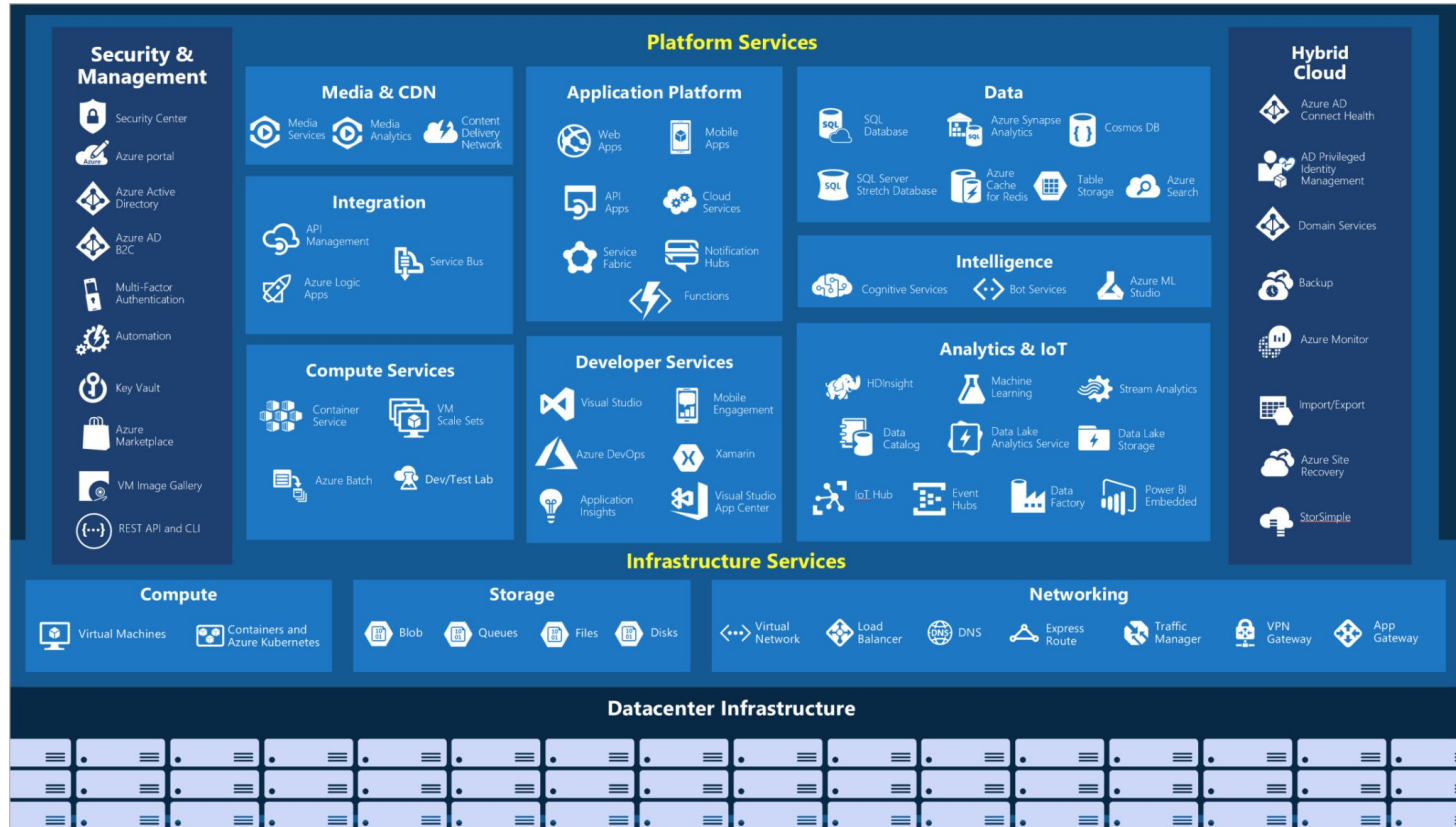


Reliability



Productivity

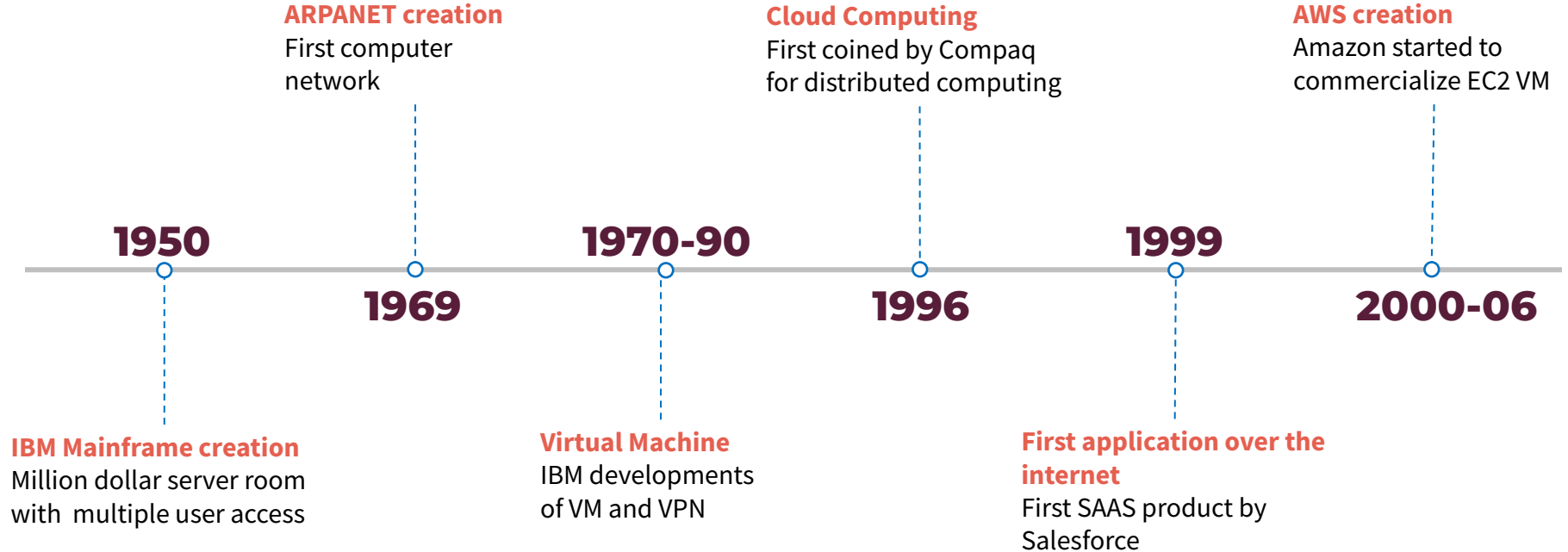
Microsoft Azure platform



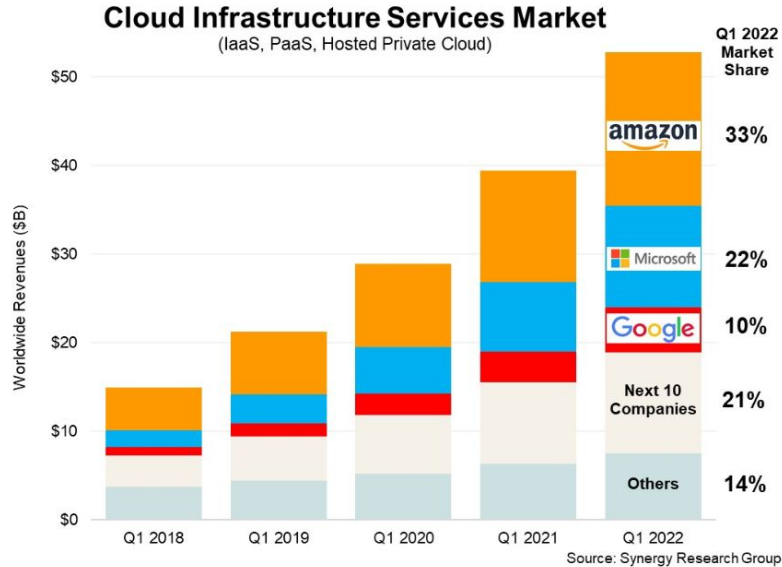
DEVELOPMENT OF CLOUD COMPUTING

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History of Cloud Computing



Overview of the Cloud ecosystem



Cloud market shares

Operating Income (Loss)

Operating income (loss) by segment is as follows (in millions):

Operating Income (Loss):

North America

International

AWS

Consolidated

Year Ended December 31,	
2020	2021
\$ 8,651	\$ 7,271
717	(924)
13,531	18,532
<u>\$ 22,899</u>	<u>\$ 24,879</u>

Amazon annual report 2022

Amazon Annual report Net Sales in Millions

	Year Ended December 31,		
	2014	2015	2016
Net Sales:			
North America	\$ 50,834	\$ 63,708	\$ 79,785
International	33,510	35,418	43,983
AWS	4,644	7,880	12,219
Total consolidated	\$ 88,988	\$ 107,006	\$ 135,987
Year-over-year Percentage Growth:			
North America	23%	25%	25%
International	12	6	24
AWS	49	70	55
Total consolidated	20	20	27
Year-over-year Percentage Growth, excluding the effect of foreign exchange rates:			
North America	23%	26%	25%
International	14	21	26
AWS	49	70	55
Total consolidated	20	26	28
Net Sales Mix:			
North America	57%	60%	59%
International	38	33	32
AWS	5	7	9
Total consolidated	100%	100%	100%

	Year Ended December 31,	
	2020	2021
Net Sales:		
North America	\$ 236,282	\$ 279,833
International	104,412	127,787
AWS	45,370	62,202
Consolidated	\$ 386,064	\$ 469,822
Year-over-year Percentage Growth:		
North America	38 %	18 %
International	40	22
AWS	30	37
Consolidated	38	22
Year-over-year Percentage Growth, excluding the effect of foreign exchange rates:		
North America	38 %	18 %
International	38	20
AWS	30	37
Consolidated	37	21
Net sales mix:		
North America	61 %	60 %
International	27	27
AWS	12	13
Consolidated	100 %	100 %

Amazon annual report 2017

Amazon annual report 2022

Cloud computing and its benefits

Capital Expenditure vs Operational Expenditure

Capital Expenditure

Capital expenditure is the cost a business incurs to acquire assets that will provide benefits beyond the current year.

Long-term investment

Upfront cost

Full responsibility & Ownership

Deductible over the lifetime of a tangible asset

Overbuying for future capacity requirements

Operational Expenditure

Operating expenses refer to the money a company spends to run day-to-day operations.

Short-term investment

Pay-as-you-go pricing

Limited responsibility & Ownership

Deducted in full within the same year they are incurred

Flexibility of resource allocation

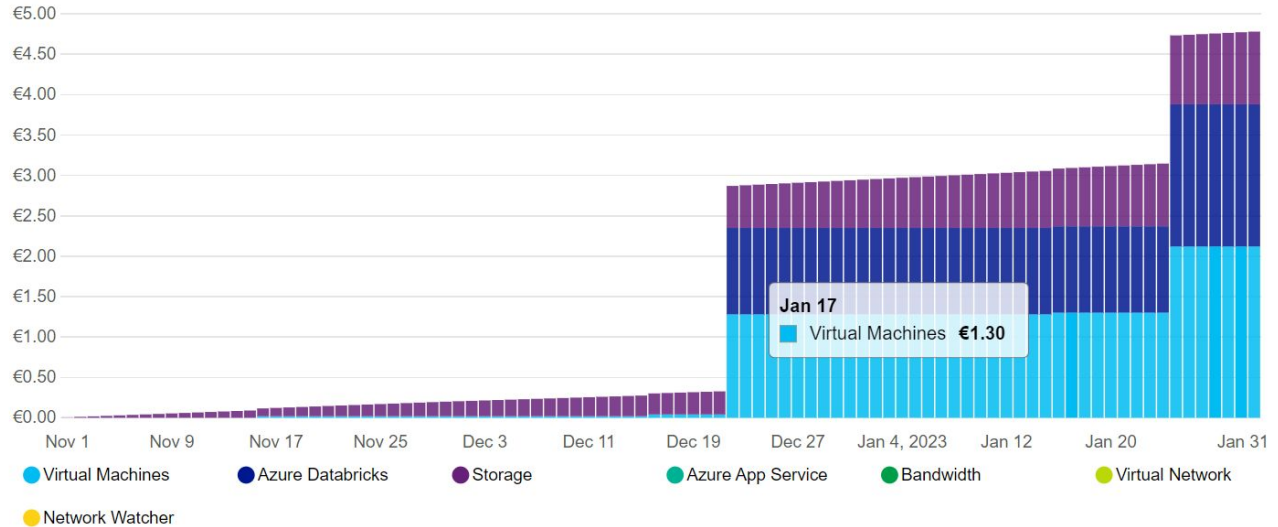
Consumption based model

No upfront costs

No wasted resources




Pay for additional resources
when needed

Stop paying at any time



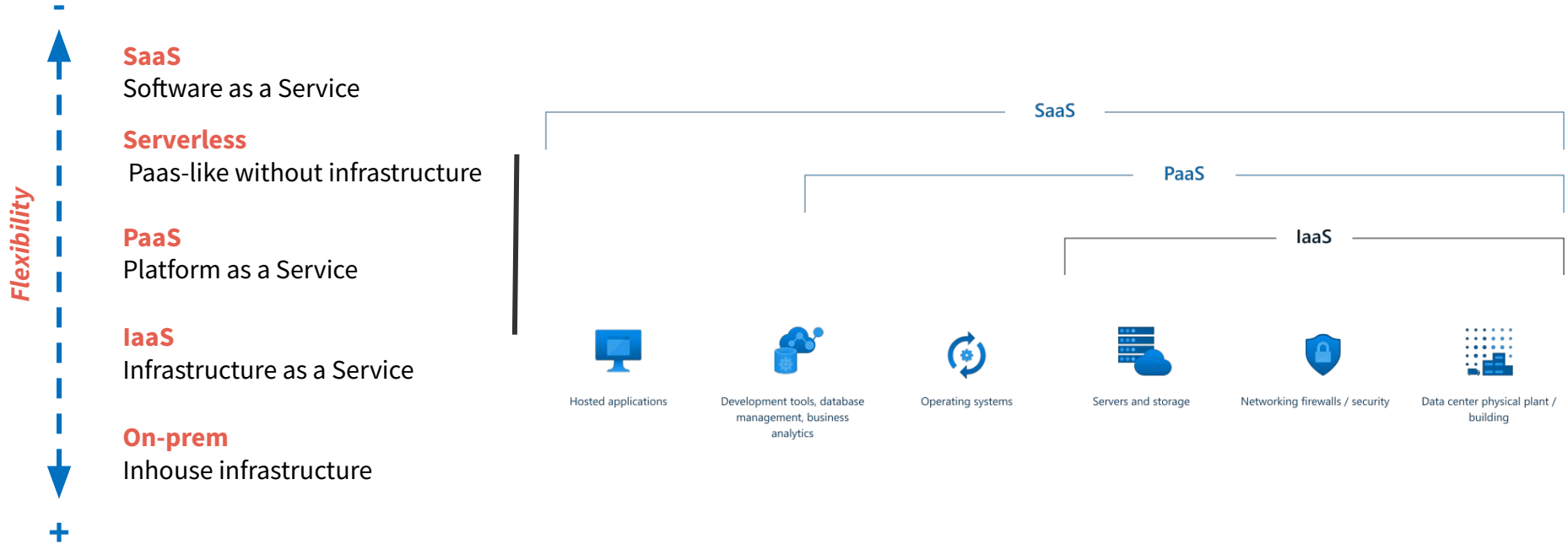
Share Responsibility Model

Responsibility		SaaS	PaaS	IaaS	On-prem
Responsibility always retained by the customer	Information and data	Customer	Customer	Customer	Customer
	Devices (Mobile and PCs)	Customer	Customer	Customer	Customer
	Accounts and identities	Customer	Customer	Customer	Customer
Responsibility varies by type	Identity and directory infrastructure	Shared	Shared	Customer	Customer
	Applications	Microsoft	Shared	Customer	Customer
	Network controls	Microsoft	Shared	Customer	Customer
	Operating system	Microsoft	Customer	Customer	Customer
Responsibility transfers to cloud provider	Physical hosts	Microsoft	Microsoft	Microsoft	Customer
	Physical network	Microsoft	Microsoft	Microsoft	Customer
	Physical datacenter	Microsoft	Microsoft	Microsoft	Customer

 Microsoft  Customer  Shared

Describe cloud service types

On-prem, IAAS, PAAS and SAAS



Service types example

IAAS	PAAS	SAAS
<ul style="list-style-type: none">- Lift-and-shift migration- Testing & development	<ul style="list-style-type: none">- Development Framework- Analytics or business intelligence	<ul style="list-style-type: none">- Email and messaging.- Business productivity applications.- Finance and expense tracking.

Quizz session

https://steven-vcnt.github.io/Steven-Vcnt/BSB%20Courses/1.describe_cloud_concepts/

Describe Cloud Concepts

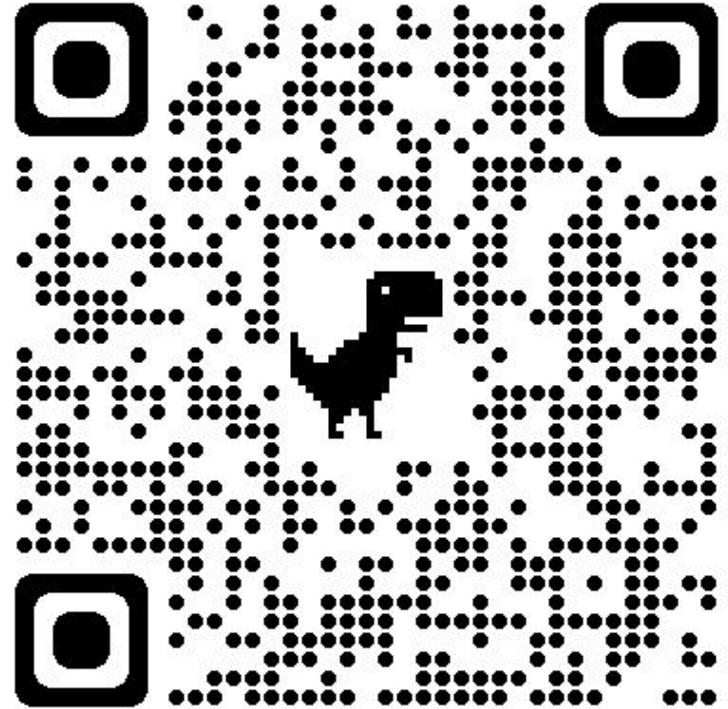


WORKSHOP

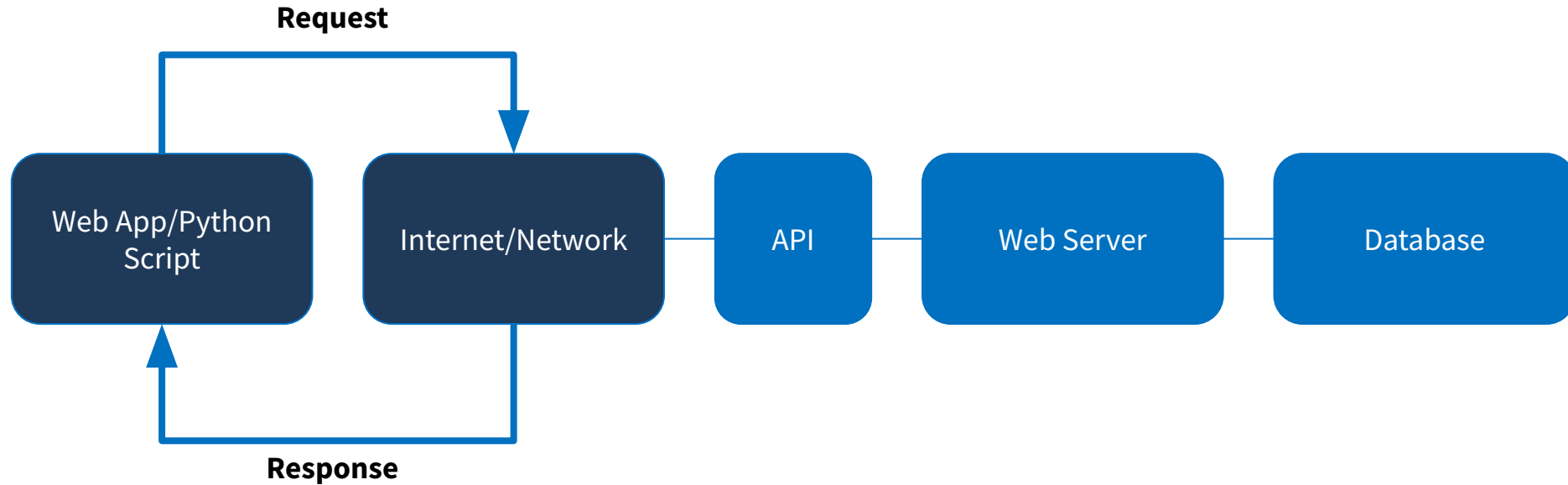


Python Basics

https://steven-vcnt.github.io/Steven-Vcnt/BSB%20Courses/2.python_basics/



API - Application Programming Interface

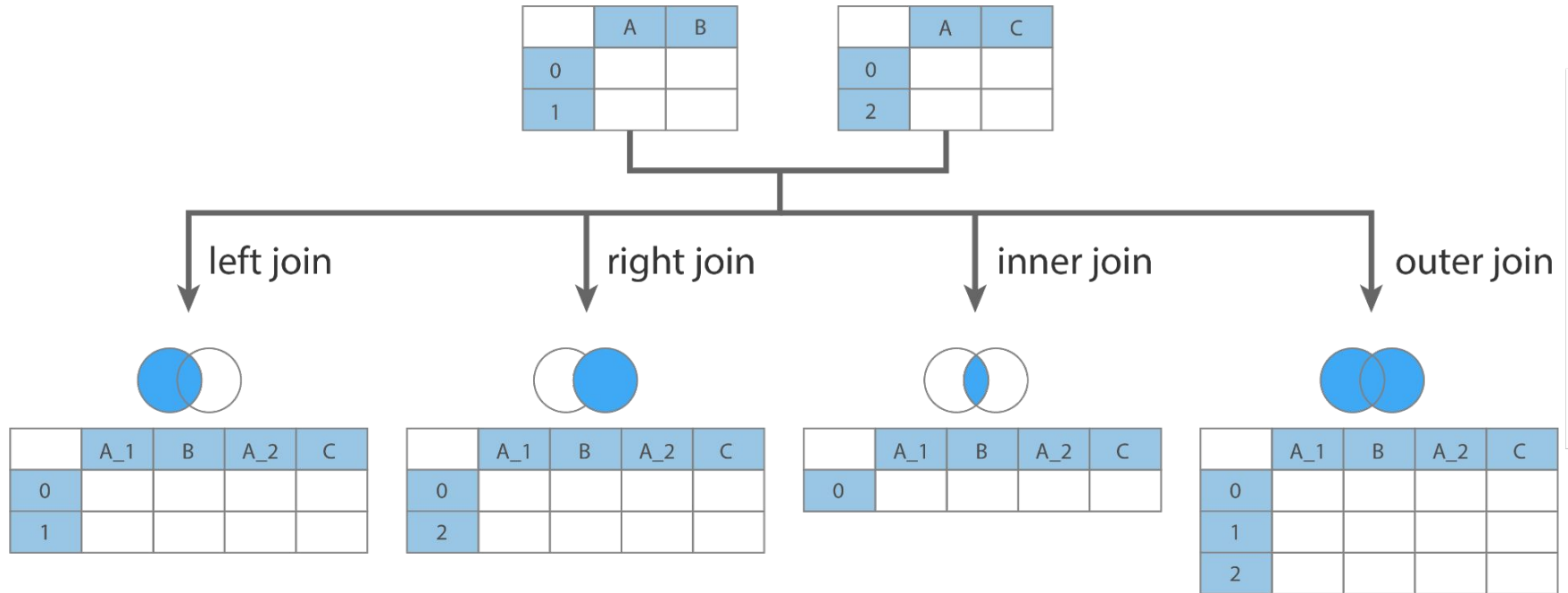


API Basics

https://steven-vcnt.github.io/Steven-Vcnt/BSB%20Courses/3.api_basics/



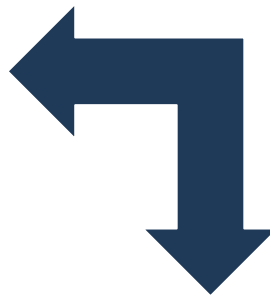
Pandas DataFrame Join



[Python Pandas DataFrame Join, Merge, and Concatenate | by Jiahui Wang | Towards Data Science](#)

pd.json_normalize() - Normalize JSON data into a flat table

```
data = [
    {
        "id": 1,
        "name": "Cole Volk",
        "fitness": {"height": 130, "weight": 60},
    },
    {"name": "Mark Reg", "fitness": {"height": 130, "weight": 60}},
    {
        "id": 2,
        "name": "Faye Raker",
        "fitness": {"height": 130, "weight": 60},
    },
]
```



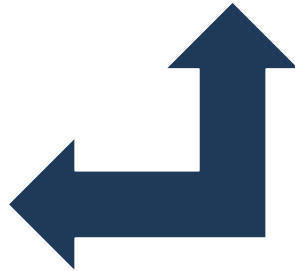
	id	name	fitness.height	fitness.weight
0	1.0	Cole Volk	130	60
1	NaN	Mark Reg	130	60
2	2.0	Faye Raker	130	60

[pandas.json_normalize — pandas 2.1.1 documentation](#)

Pivot & Unpivot table

City	Population	Unit
Paris	2	M
Lyon	500	K
Saint-Emilion	1,8	K

Unit	Paris	Lyon	Saint-Emilion
K	None	500	1,8
M	2	None	None



[pandas.melt — pandas 2.1.1 documentation](#)

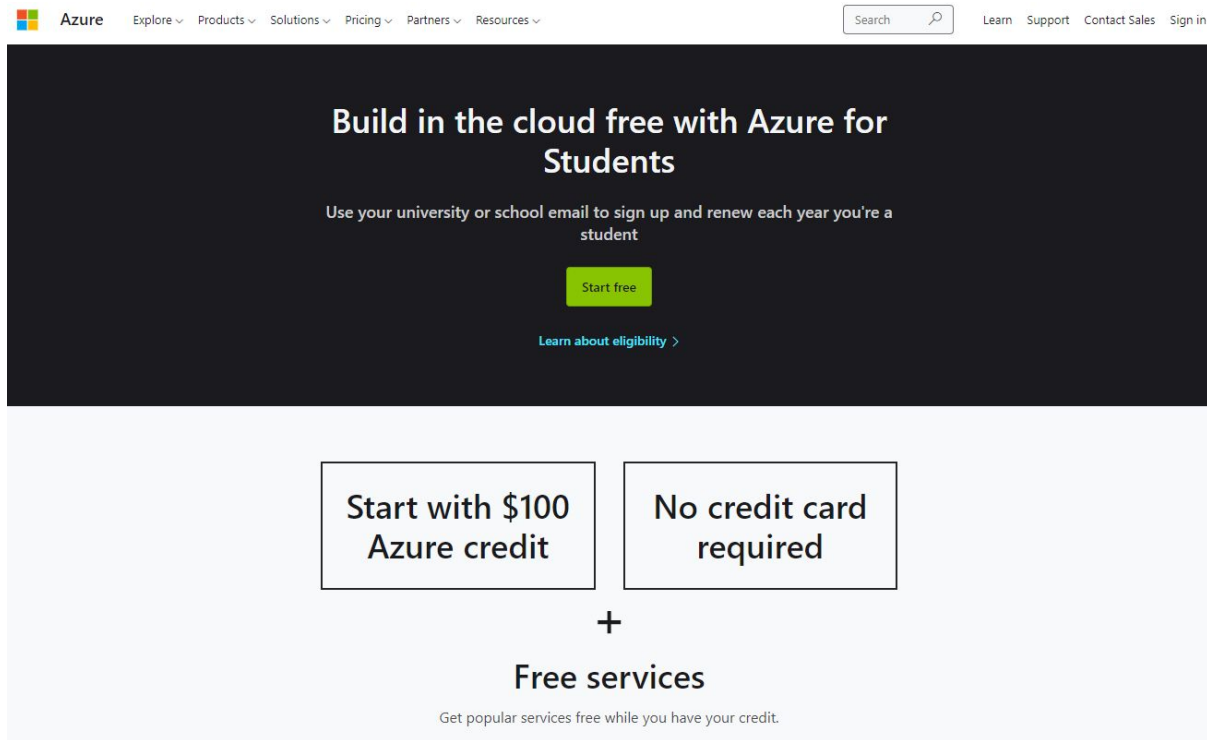
Azure Setup

https://steven-vcnt.github.io/Steven-Vcnt/BSB%20Courses/4.azure_setup/



Setup Azure Student Account

Create a new account the bsb mail address : [Azure for Students – Free Account Credit](#)



The screenshot shows the Azure for Students landing page. At the top, there is a navigation bar with the Azure logo, links for Explore, Products, Solutions, Pricing, Partners, and Resources, a search bar, and links for Learn, Support, Contact Sales, and Sign in. The main section has a dark background with the text "Build in the cloud free with Azure for Students". Below this, it says "Use your university or school email to sign up and renew each year you're a student". There is a green "Start free" button and a link "Learn about eligibility >". The bottom section has a light background and features two boxes: "Start with \$100 Azure credit" and "No credit card required", followed by a plus sign and the text "Free services". At the very bottom, it says "Get popular services free while you have your credit."

Azure

Explore Products Solutions Pricing Partners Resources

Search

Learn Support Contact Sales Sign in

Build in the cloud free with Azure for Students

Use your university or school email to sign up and renew each year you're a student

Start free

[Learn about eligibility >](#)

Start with \$100
Azure credit

No credit card
required

+

Free services

Get popular services free while you have your credit.

Setup Azure Environment



Resource groups



Create



View

Container that holds related resources for an Azure solution



Cost Management +
Billing



View

Better manage cloud spend by managing costs across all your clouds with a single, unified view.



Storage accounts



Create



View

Contains all of your Azure Storage data objects, including blobs, file shares, queues, tables, and disks.