



DIGITAL
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DIGITAL TALENT SCHOLARSHIP 2019

Big Data Analytics



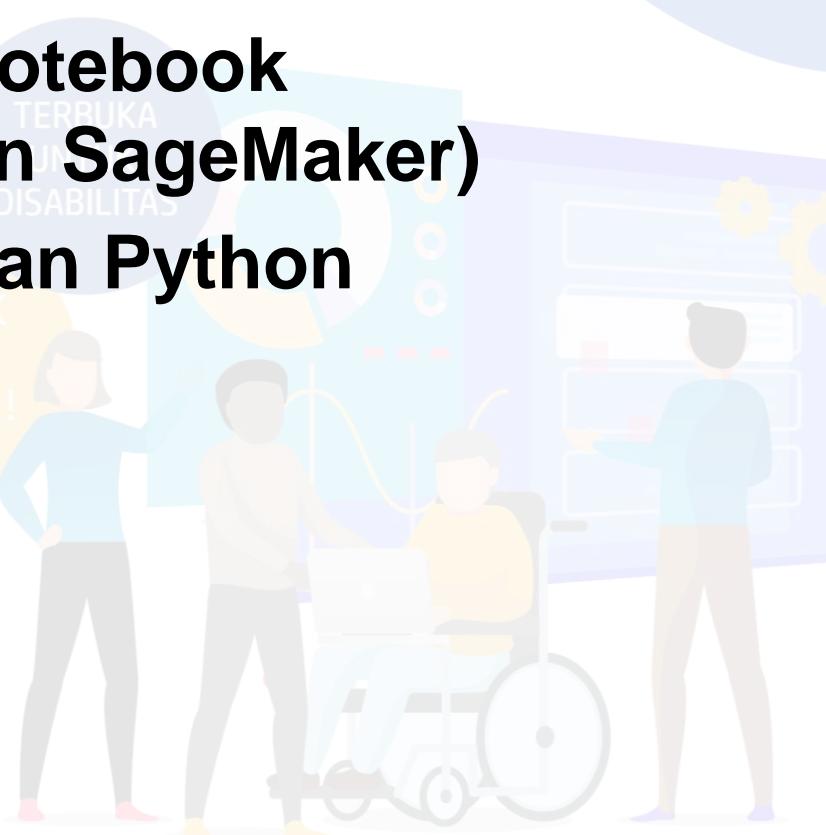
Praktek Membuat Instance Jupyter Notebook dari AWS Cloud (Amazon SageMaker) & Pengenalan Pemrograman Python Ke-1 of 2

Oleh: Imam Cholissodin | imamcs@ub.ac.id, Putra Pandu Adikara, Sufia Adha Putri
Asisten: Guedho, Sukma, Anshori, Aang dan Gusti

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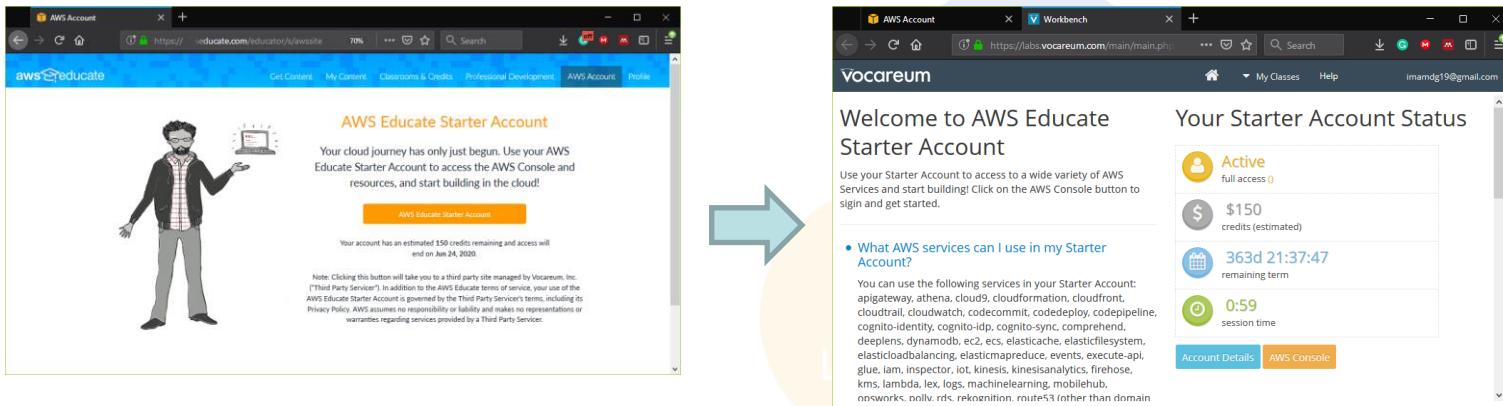
Pokok Bahasan

- 1. Buat Instance Jupyter Notebook
dari AWS Cloud (Amazon SageMaker)**
- 2. Pengenalan Pemrograman Python
(run di SageMaker)**
- 3. Tugas**

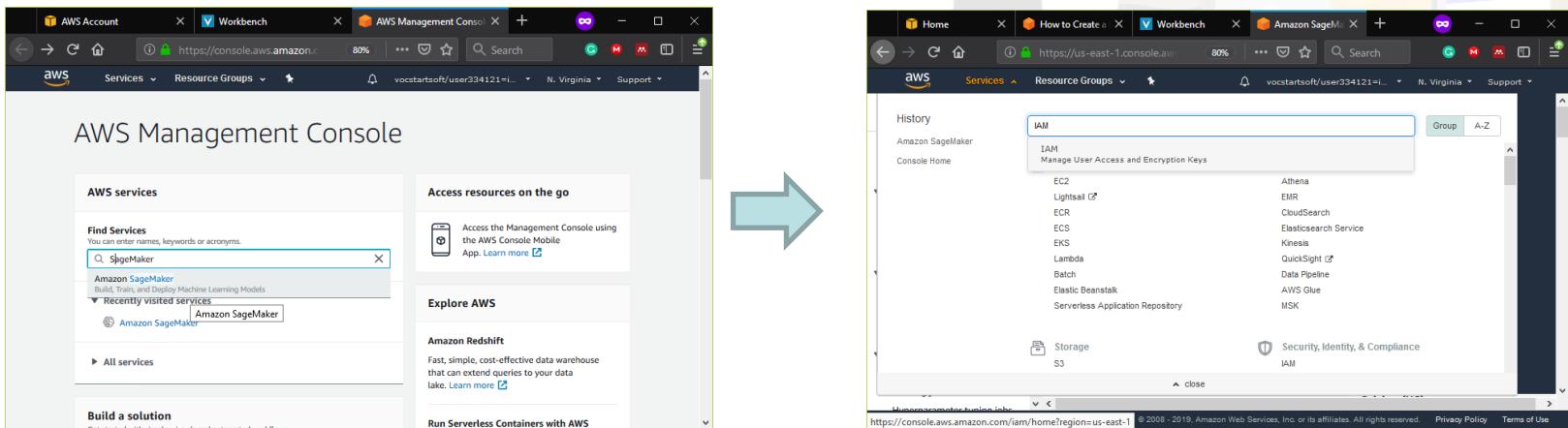


Buat SageMaker

- Login Ke AWS Educate, Klik “AWS Educate Starter Account” > “AWS Console”

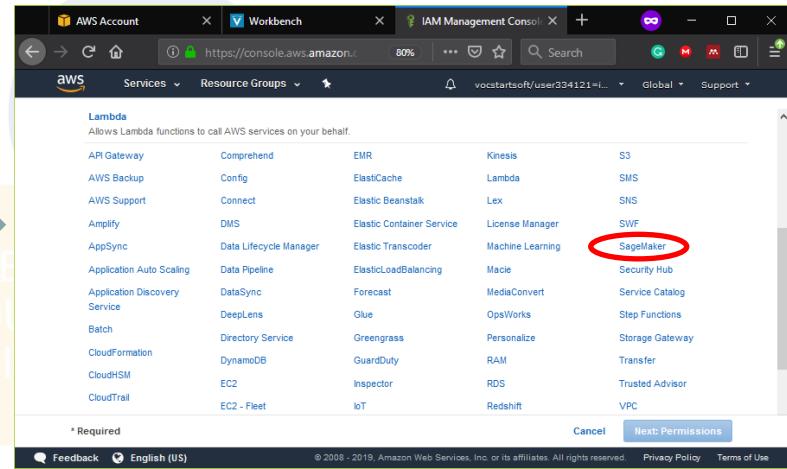
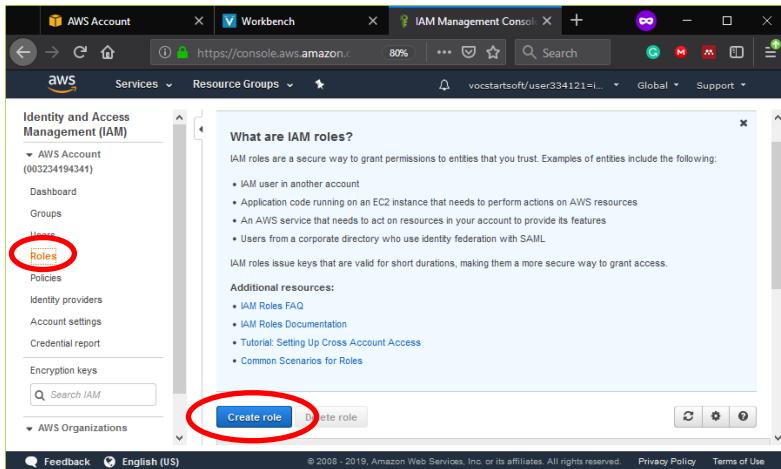


- Pada “WS Management Console” > ketik “SageMaker” > Klik “Amazon SageMaker” > Klik Services > ketik “IAM” > Klik “IAM Manage ..”

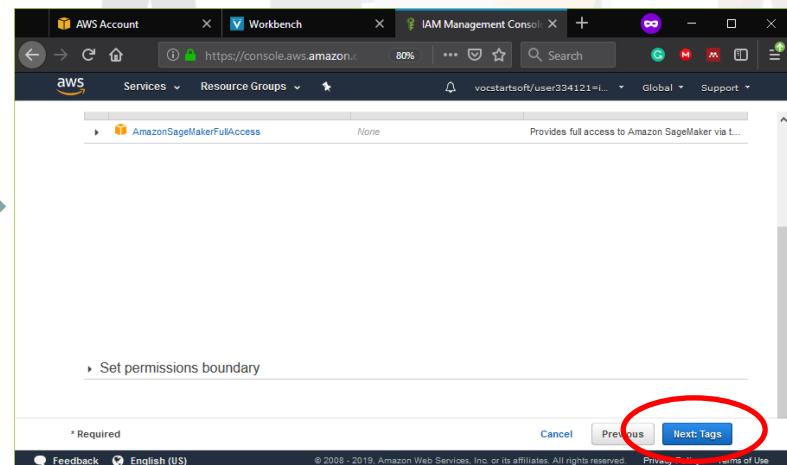
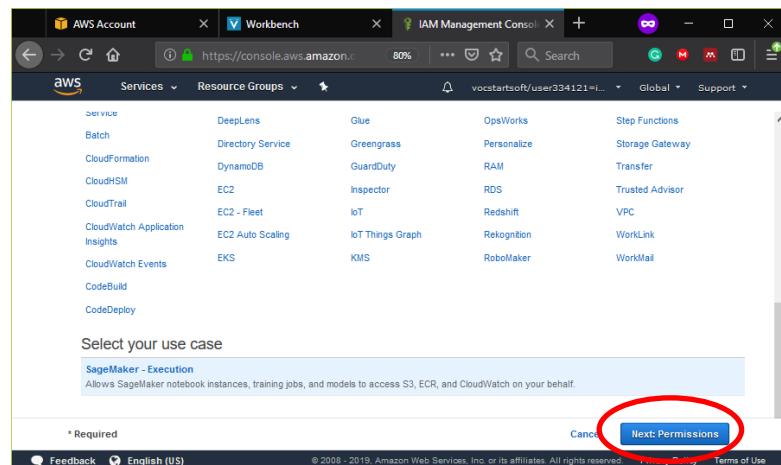


Buat SageMaker

- Klik “Roles”, klik “Create role” > Klik “SageMaker”

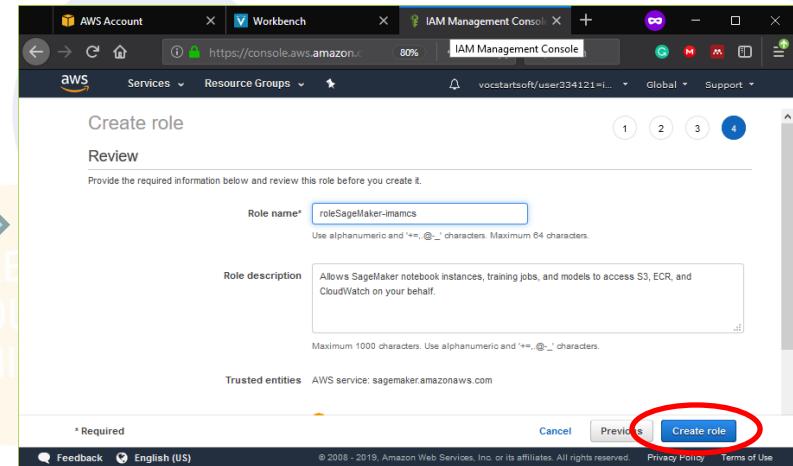
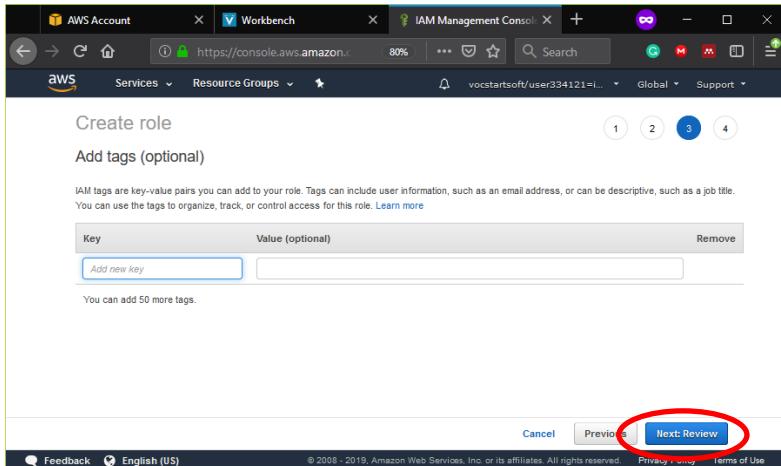


- Klik “Next: Permissions” > Klik “Next: Tags”

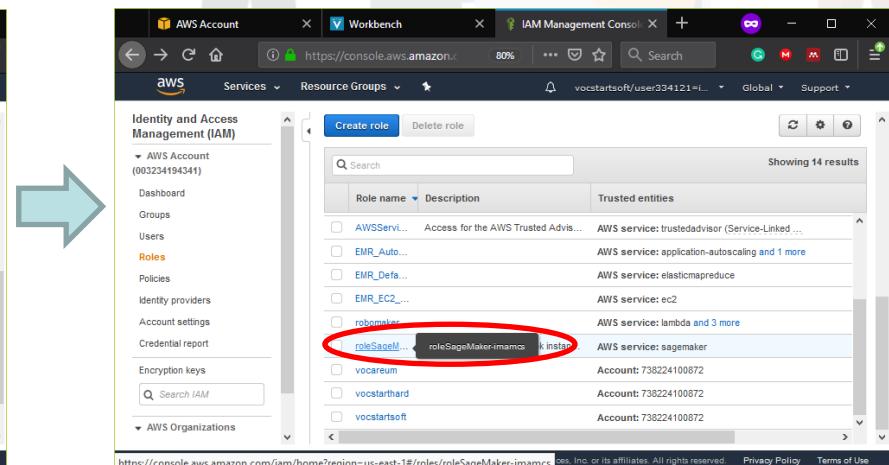
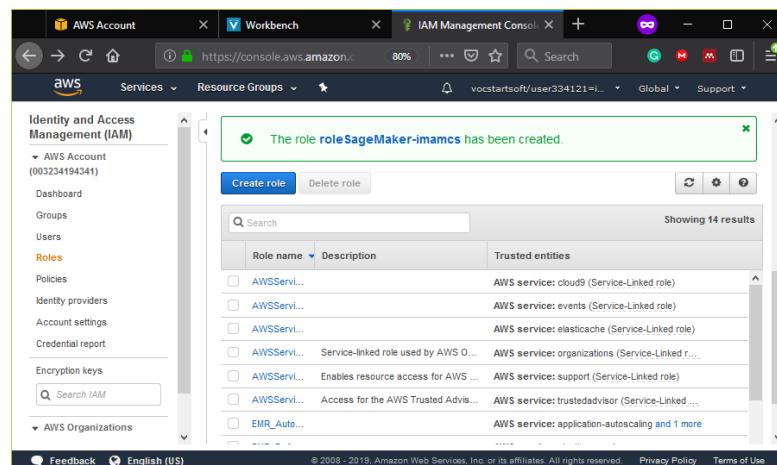


Buat SageMaker

- Klik “Next: Review” > Masukkan Role name dll. > Klik “Create role”



- The role “roleSageMaker-imamcs” has been created > Klik role yg telah dibuat



Buat SageMaker

- Copy Role ARN > "arn:aws:iam::003234194341:role/roleSageMaker-imamcs" dengan klik icon copy

The screenshot shows the AWS IAM Management Console. On the left, there's a sidebar with 'Identity and Access Management (IAM)' navigation. Under 'Roles', the 'roleSageMaker-imamcs' role is selected. The main area displays the 'Summary' of this role. Key details shown include:

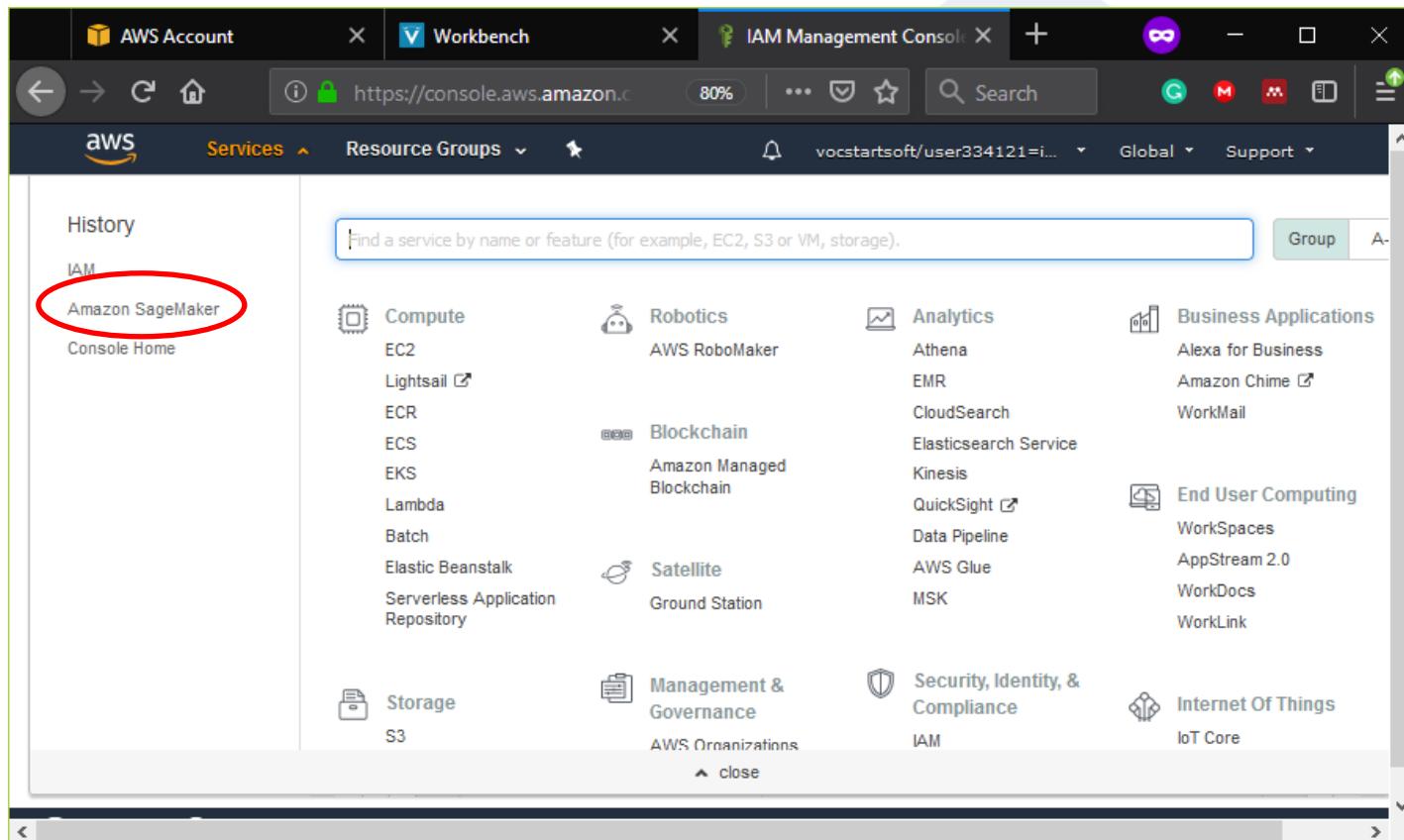
- Role ARN:** arn:aws:iam::003234194341:role/roleSageMaker-imamcs (highlighted with a red circle)
- Role description:** Allows SageMaker notebook instances, training jobs, and models to access S3, ECR, and CloudWatch on your behalf. | Edit
- Instance Profile ARNs:** [link]
- Path:** /
- Creation time:** 2019-07-09 21:33 UTC+0700
- Maximum CLI/API session duration:** 1 hour | Edit

Below the summary, there are tabs for 'Permissions', 'Trust relationships', 'Tags', 'Access Advisor', and 'Revoke sessions'. Under 'Permissions', it says 'Permissions policies (1 policy applied)'. There are buttons for 'Attach policies' and 'Add inline policy'. At the bottom, there are dropdowns for 'Policy name' and 'Policy type'.

- Hasil copy tersebut akan dipaste pada saat membuat instance SageMaker

Buat SageMaker

- Klik “Services” > Klik “Amazon SageMaker”



Buat SageMaker

- Klik “Create notebook instance”

The screenshot shows the Amazon SageMaker console interface. The left sidebar contains navigation links for Dashboard, Search, Ground Truth (Labeling jobs, Labeling datasets, Labeling workforces), Notebook (Notebook instances, Lifecycle configurations, Git repositories), and Training (Algorithms, Training jobs). The main content area features the Amazon SageMaker logo and the tagline "Build, train, and deploy machine learning models at scale". Below this, a sub-tagline reads "The quickest and easiest way to get ML models from idea to production." To the right, a "Get started" box contains text about exploring AWS data and creating models via training jobs, with a prominent "Create notebook instance" button highlighted by a red oval. At the bottom of the page, there are links for Feedback, English (US), and footer information including copyright (© 2008 - 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved.), Privacy Policy, and Terms of Use.

Buat SageMaker

- Masukkan Notebook instance nama, misal “SageMaker-imamcs”

The screenshot shows the AWS SageMaker console interface. The top navigation bar includes tabs for AWS Account, Workbench, and Amazon SageMaker. The browser address bar shows the URL [https://us-east-1.console.aws.amazon.com/sagemaker/notebooks/CreateNotebookInstance?regionName=N. Virginia](https://us-east-1.console.aws.amazon.com/sagemaker/notebooks/CreateNotebookInstance?regionName=N.%20Virginia). The main content area is titled "Create notebook instance". It displays a summary of the instance configuration: "Notebook instance name: SageMaker-imamcs", "Notebook instance type: ml.t2.medium", and "Elastic Inference: none". A link to "Additional configuration" is also visible.

AWS Account Workbench Amazon SageMaker

https://us-east-1.console.aws.amazon.com/sagemaker/notebooks/CreateNotebookInstance?regionName=N. Virginia

Services Resource Groups N. Virginia Support

Amazon SageMaker > Notebook instances > Create notebook instance

Create notebook instance

Amazon SageMaker provides pre-built fully managed notebook instances that run Jupyter notebooks. The notebook instances include example code for common model training and hosting exercises. [Learn more](#)

Notebook instance settings

Notebook instance name

SageMaker-imamcs

Maximum of 63 alphanumeric characters. Can include hyphens (-), but not spaces. Must be unique within your account in an AWS Region.

Notebook instance type

ml.t2.medium

Elastic Inference [Learn more](#)

none

► Additional configuration

Feedback English (US)

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Buat SageMaker

- Scroll ke “Permissions and encryption” > klik “Choose IAM role” > klik “Enter a custom IAM role ARN”

The screenshot shows the 'Permissions and encryption' section of the AWS SageMaker console. At the top, there are three tabs: 'AWS Account', 'Workbench', and 'Amazon SageMaker'. The 'Amazon SageMaker' tab is active. Below the tabs, the URL is https://us-east-1.console.aws.amazon.com/sagemaker/notebooks/config?notebookArn=arn:aws:sagemaker:us-east-1:123456789012:notebook/12345678901234567890123456789012. The page title is 'Permissions and encryption'. The 'IAM role' section contains a note about notebook instances requiring permissions to call other services like SageMaker and S3. It offers to choose an IAM role or create a new one, or enter a custom IAM role ARN. The 'Enter a custom IAM role ARN' field is highlighted with a red oval. Below this, there are options for 'Encryption key - optional' and 'Network - optional'. At the bottom, there are links for 'Feedback', 'English (US)', and 'Privacy Policy / Terms of Use'.

Buat SageMaker

- Paste “Role ARN”,
misal “arn:aws:iam::003234194341:role/roleSageMaker-imamcs”
ke “Custom IAM role ARN”

The screenshot shows the AWS SageMaker console with the 'Permissions and encryption' configuration page open. In the 'Custom IAM role ARN' input field, the value 'arn:aws:iam::003234194341:role/roleSageMaker-imamcs' is highlighted with a red oval. Below this field, there are options for 'Root access - optional' (Enable or Disable) and 'Encryption key - optional' (No Custom Encryption). At the bottom of the page, there is a section for 'Network - optional'.

Buat SageMaker

- Scroll ke bawah > Klik “Create notebook Instance”

The screenshot shows the 'Create notebook Instance' wizard in the AWS SageMaker console. At the top, there are tabs for 'AWS Account', 'Workbench', and 'Amazon SageMaker'. The 'Amazon SageMaker' tab is active. Below the tabs, the URL is https://us-east-1.console.aws.amazon.com/sagemaker/notebooks/CreateNotebookInstance?&source=CreateNotebookInstance&arn=®ion=us-east-1. The page displays several optional configuration sections:

- Root access - optional:** A radio button is selected for "Enable - Give users root access to the notebook".
- Encryption key - optional:** A dropdown menu shows "No Custom Encryption".
- Network - optional:** A section header.
- Git repositories - optional:** A section header.
- Tags - optional:** A section header.

At the bottom right, there are two buttons: "Cancel" and a large orange "Create notebook instance" button, which is circled in red.

Buat SageMaker

- Notebook berhasil dibuat, perhatikan statusnya masih “Pending”, tunggu beberapa waktu sampai statusnya “InService”

Name	Instance	Creation time	Status	Actions
SageMaker-imamcs	ml.t2.medium	Jul 09, 2019 15:12 UTC	Pending	[View]

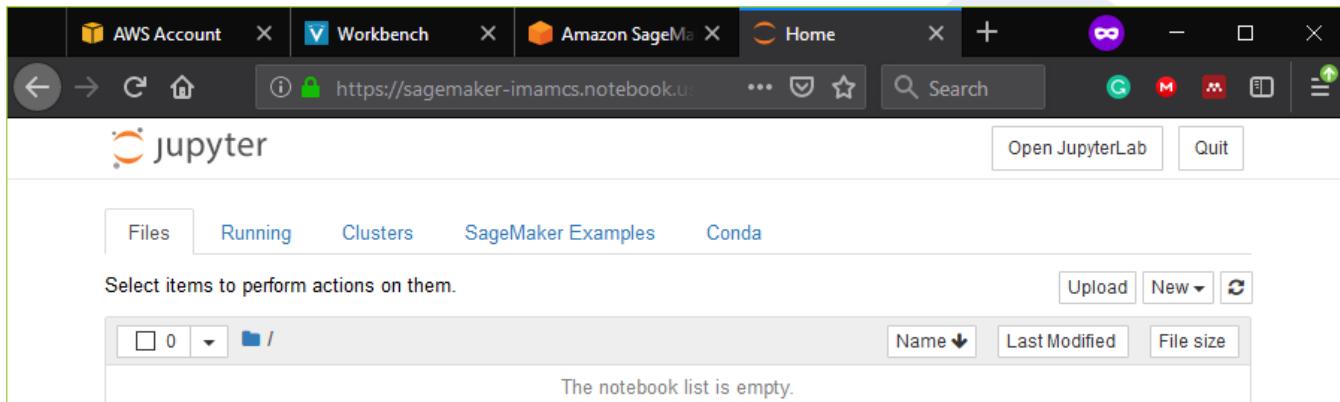
TERBUKA
UNTUK
DISABILITAS

Name	Instance	Creation time	Status	Actions
SageMaker-imamcs	ml.t2.medium	Jul 09, 2019 15:12 UTC	InService	Open Jupyter Open JupyterLab

Klik “Open Jupyter”

Buat SageMaker

- Jupyter Notebook siap untuk digunakan koding > Klik New > “conda_python3”

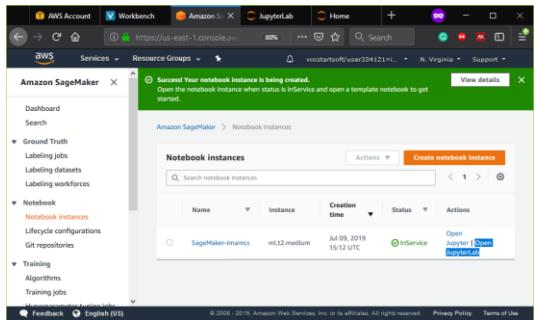


- Coba koding sederhana, berhasil :D

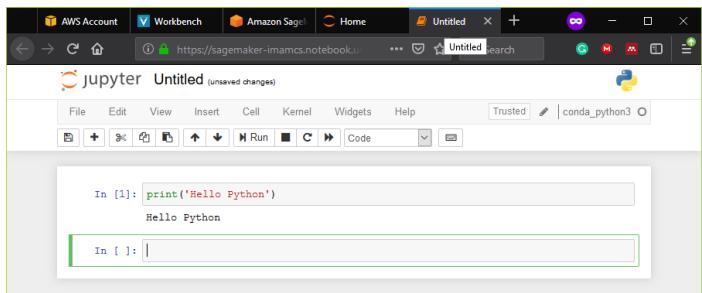
A screenshot of a Jupyter notebook titled "Untitled (unsaved changes)". The top menu includes "File", "Edit", "View", "Insert", "Cell", "Kernel", "Widgets", and "Help". The "Kernel" dropdown shows "conda_python3". The notebook interface has a toolbar with icons for file operations and cell execution. In the code editor, there is a cell labeled "In [1]:" containing the Python code "print('Hello Python')". The output of the cell is "Hello Python". Below the cell is another empty input field labeled "In []:".

Open Jupyter vs JupyterLab

- Coba Klik “Open JupyterLab”



- “Open Jupyter” vs “Open JupyterLab”



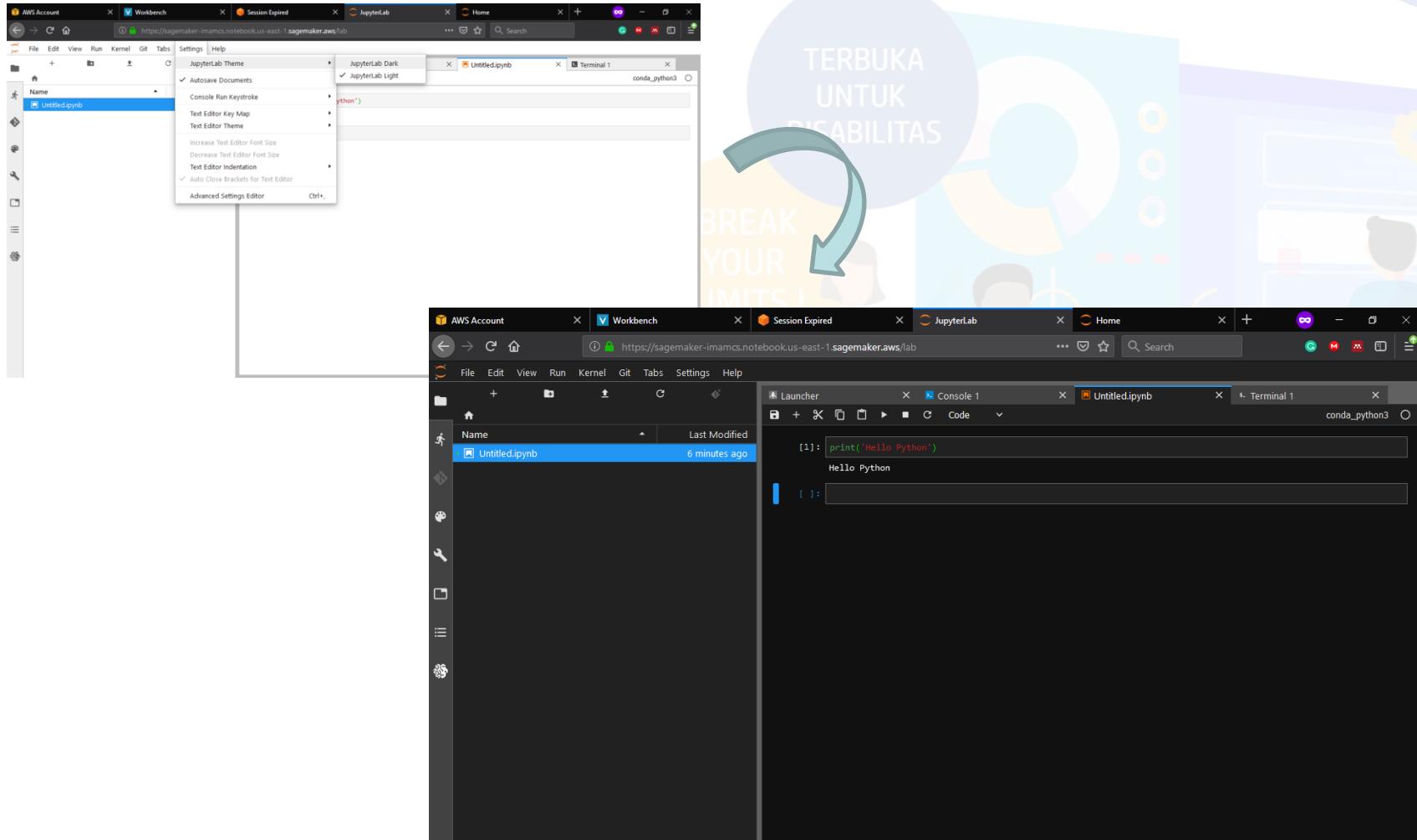
Open Jupyter

The image compares the standard Jupyter interface on the left with the JupyterLab interface on the right. Both are shown in browser windows. The JupyterLab interface is more modern and feature-rich, featuring a sidebar with file management, a launcher for different notebooks, and a terminal window. A large graphic overlay on the right side of the image contains the text "TERBUKA UNTUK DISABILITAS" and "BREAK YOUR LIMITS!".

Open JupyterLab

Open Jupyter vs JupyterLab

- Coba ubah theme pada “JupyterLab” > Klik Setting > Klik “JupyterLab Dark”



Open Jupyter vs JupyterLab

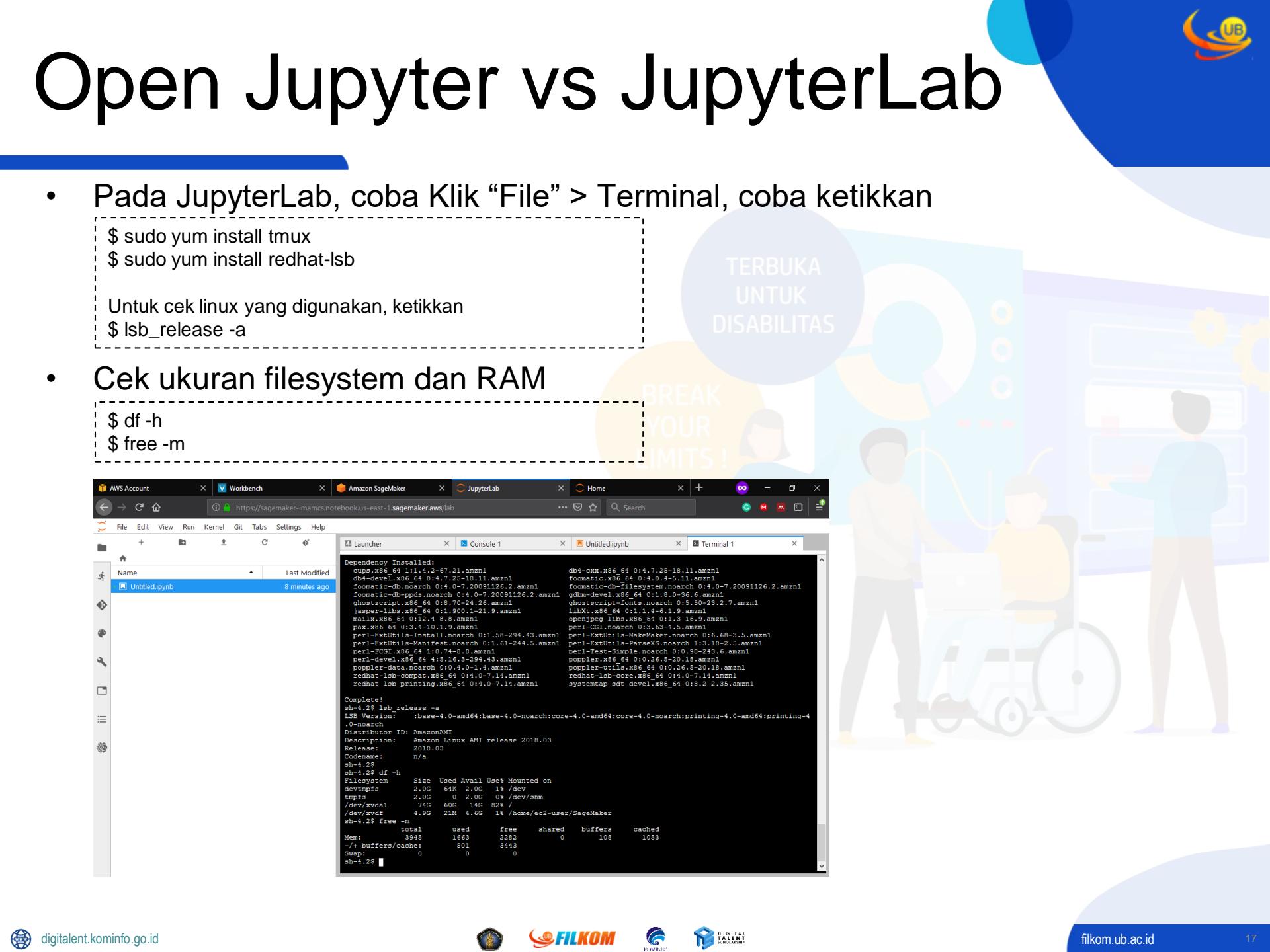
- Pada JupyterLab, coba Klik “File” > Terminal, coba ketikkan

```
$ sudo yum install tmux  
$ sudo yum install redhat-lsb
```

Untuk cek linux yang digunakan, ketikkan
\$ lsb_release -a

- Cek ukuran filesystem dan RAM

```
$ df -h  
$ free -m
```



A screenshot of a web browser showing multiple tabs: AWS Account, Workbench, Amazon SageMaker, JupyterLab, Home, and a search bar. The JupyterLab tab is active, displaying a terminal window titled 'Terminal 1'. The terminal shows command-line output related to package installation and system status.

```
Dependency Installed:  
cve-2016-04-16-67.24.amzn1 db4-cxx.x86_64 0:4.7.25-18.11.amzn1  
cve-devel.x86_64 0:4.7.25-18.11.amzn1 foomatic.x86_64 0:4.0.4-5.11.amzn1  
foomatic-db-noarch 0:4.0-7.20091126.2.amzn1 foomatic-db-filesystem.noarch 0:4.0-7.20091126.2.amzn1  
gdbm-devel.x86_64 0:1.8.0-36.6.amzn1 gdm.x86_64 0:1.1.4-6.1.9.amzn1  
ghostscript-fonts.noarch 0:5.50-23.2.7.amzn1 libXt.x86_64 0:1.1.4-6.1.9.amzn1  
image-magick.x86_64 0:6.4.4-3.8.amzn1 openjpeg-libs.x86_64 0:1.3-16.9.amzn1  
perl-ExtUtils-Install.noarch 0:1.58-234.43.amzn1 perl-ExtUtils-MakeMaker.noarch 0:6.69-3.5.amzn1  
perl-ExtUtils-Manifest.noarch 0:1.61-244.5.amzn1 perl-ExtUtils-ParseXS.noarch 1:3.18-2.5.amzn1  
perl-FCGI.x86_64 1:10.74-8.8.amzn1 perl-Test-Simple.noarch 0:0.98-243.6.amzn1  
perl-devel-data.noarch 0:0.4.0-1.4.amzn1 poppler.x86_64 0:0.26.5-20.18.amzn1  
poppler-data.noarch 0:0.4.0-1.4.amzn1 poppler-utils.x86_64 0:0.26.5-20.18.amzn1  
redhat-lsb-compat.x86_64 0:4.0-7.14.amzn1 redhat-lsb-core.x86_64 0:4.0-7.14.amzn1  
redhat-lsb-printing.x86_64 0:4.0-7.14.amzn1 systemtap-sdt-devel.x86_64 0:3.2-2.35.amzn1  
  
Completed!  
sh-4.2$ lsb_release -a  
LSB Version: :base-4.0-amd64:base-4.0-noarch:core-4.0-amd64:core-4.0-noarch:printing-4.0-amd64:printing-4.0-noarch  
Distributor ID: AmazonAMI  
Description: Amazon Linux AMI release 2018.03  
Release: 2018.03  
Codename: n/a  
sh-4.2$ df -h  
Filesystem Size Used Avail Use% Mounted on  
devtmpfs 2.0G 64K 2.0G 1% /dev  
tmpfs 2.0G 0 2.0G 0% /dev/shm  
/dev/xvda1 74G 60G 14G 82% /  
/dev/xvda1 4.9G 21M 4.6G 1% /home/ec2-user/SageMaker  
sh-4.2$ free -m  
total used free shared buffers cached  
Mem: 3945 1663 2282 0 108 1053  
/+ buffers/cache: 501 3443  
Swap: 0 0 0  
sh-4.2$
```

Open Jupyter vs JupyterLab

- Pada Terminal, coba ketikkan

Untuk dependensi convert file *.ipynb ke *.pdf, ketikkan

```
$ pip install nbconvert
```

```
$ sudo yum install texlive-*
```

Tekan enter, jika ada pertanyaan ketika install, ketik "y", tekan enter kembali

Convert ipynb ke html

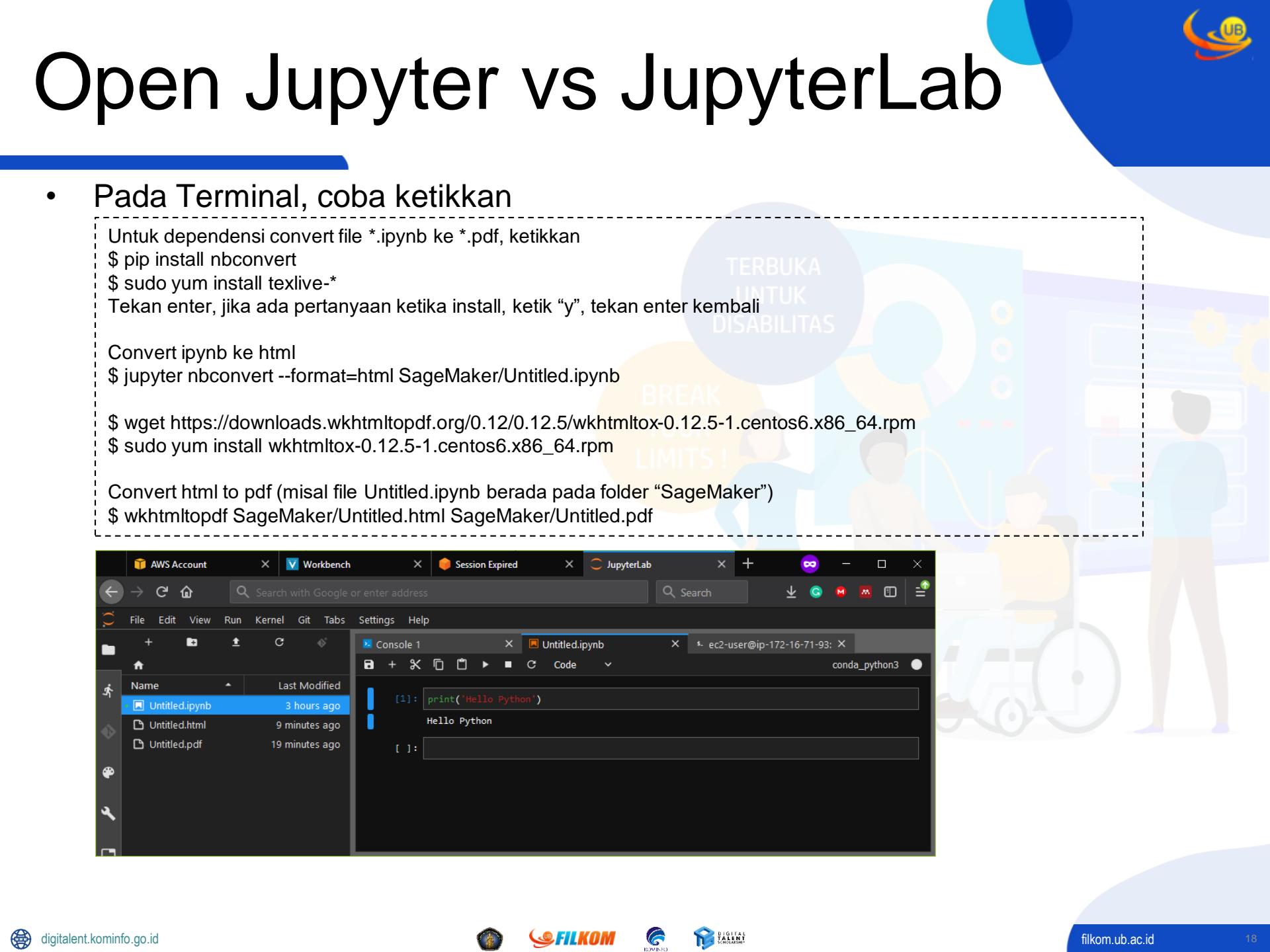
```
$ jupyter nbconvert --format=html SageMaker/Untitled.ipynb
```

```
$ wget https://downloads.wkhtmltopdf.org/0.12/0.12.5/wkhtmltox-0.12.5-1.centos6.x86_64.rpm
```

```
$ sudo yum install wkhtmltox-0.12.5-1.centos6.x86_64.rpm
```

Convert html to pdf (misal file Untitled.ipynb berada pada folder "SageMaker")

```
$ wkhtmltopdf SageMaker/Untitled.html SageMaker/Untitled.pdf
```



A screenshot of a web browser window titled "JupyterLab". The browser tabs include "AWS Account", "Workbench", "Session Expired", and the active tab "JupyterLab". The main content area shows a file explorer sidebar with files "Untitled.ipynb", "Untitled.html", and "Untitled.pdf". Below the sidebar is a code editor with a terminal-like interface. The terminal shows the command `print('Hello Python')` and its output "Hello Python". The browser's address bar is empty.

Remote Linux dari SageMaker

- Untuk me-remote sagemaker via ssh misal dengan Putty/ZOC, Anda dapat menggunakan tunneling, misal yang paling sederhana dengan tool “ngrok” atau lainnya (link step by step “<http://bit.ly/2Ldbwli>” sebagai contoh untuk remote Linux dari Google CoLab).
- Untuk remote, di AWS, Anda nantinya bisa menggunakan **AWS Glue** untuk membuat titik akhir pengembang (developer endpoint).
- Di **AWS Glue** Anda membuat Sagemaker notebook yang dapat memberi Anda akses untuk terhubung ke python atau Scala Spark REPL, atau lainnya melalui ssh, dan Anda juga dapat mengkoneksikan dengan perangkat IDE local Anda, misal PyCharm atau lainnya.
- Akses tersebut memungkinkan Anda untuk mengolah file dengan SFTP dan men-debug jarak jauh.
- Dan jika Anda perlu menginstal dependensi pada SageMaker notebook, Anda dapat menggunakan termina dari Jupyter untuk menginstal dependensi apa pun yang Anda inginkan.



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Big Data Analytics



Pengenalan Pemrograman Python

Oleh: Imam Cholissodin | imamcs@ub.ac.id, Ahmad Afif Supianto, Welly Purnomo

Asisten: Guedho Augnifico M. & Aditya Hari Bawono

Fakultas Ilmu Komputer (Filkom) Universitas Brawijaya (UB)



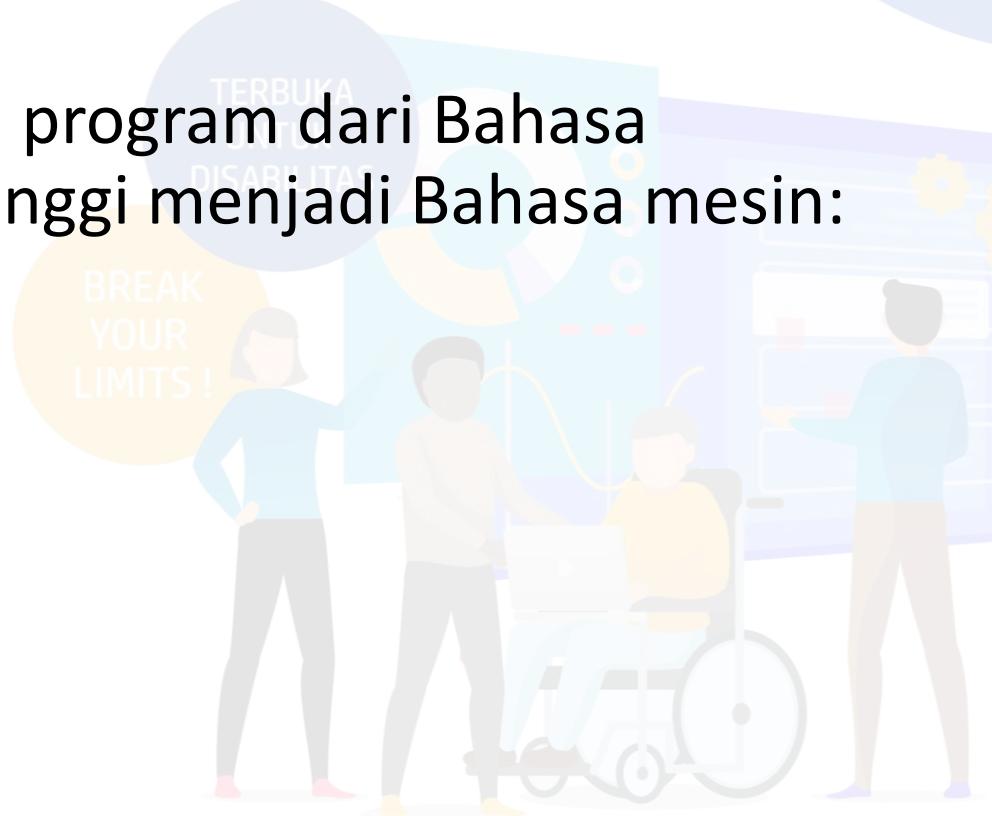
Programming - Absolute Basics

- Program membuat computer dapat digunakan
- Tanpa program, komputer tidak lebih dari sebuah benda
- Pemrograman adalah tindakan menulis program menggunakan bahasa pemrograman dalam bentuk perintah sesuai dengan yang diinginkan



Programming - Absolute Basics

- 2 cara untuk mengubah program dari Bahasa pemrograman tingkat tinggi menjadi Bahasa mesin:
 - Compilation
 - Interpretation



Pengenalan Python

- Python – Interpreted language. Python is free
- Widely-used, object-oriented, high-level programming language with dynamic semantics
- Python dibuat oleh Guido van Rossum





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PYPL Popularity of Programming Language

Pierre Carbonnelle (2019)

Worldwide, Jun 2019 compared to a year ago:

Rank	Change	Language	Share	Trend
1		Python	28.08 %	+4.7 %
2		Java	20.51 %	-1.8 %
3		Javascript	8.29 %	-0.2 %
4	↑	C#	7.41 %	-0.5 %
5	↓	PHP	6.96 %	-1.2 %
6		C/C++	5.76 %	-0.4 %
7		R	4.15 %	-0.0 %
8		Objective-C	2.82 %	-0.6 %
9		Swift	2.36 %	-0.4 %
10		Matlab	1.95 %	-0.3 %
11	↑	TypeScript	1.69 %	+0.2 %
12	↓	Ruby	1.42 %	-0.3 %
13	↑↑↑	Kotlin	1.4 %	+0.5 %
14	↓	VBA	1.33 %	-0.1 %
15	↑↑	Go	1.19 %	+0.3 %
16	↓	Scala	1.13 %	-0.1 %
17	↓↓↓	Visual Basic	1.09 %	-0.1 %
18		Perl	0.59 %	-0.2 %





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The `print()` Function - Instructions

Lihat efek dari kode berikut

```
1 print("The itsy bitsy spider climbed up the waterspout.")  
2 print("Down came the rain and washed the spider out.")  
  
1 print("The itsy bitsy spider\nclimbed up the waterspout.")  
2 print()  
3 print("Down came the rain\nand washed the spider out.")  
  
1 print("My", "name", "is", sep=" ", end="*")  
2 print("Monty", "Python.", sep="*", end="*\n")
```

- Fungsi `print` merupakan built-in function

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Built-in Functions				
abs()	delattr()	hash()	memoryview()	set()
all()	dict()	help()	min()	setattr()
any()	dir()	hex()	next()	slice()
ascii()	divmod()	id()	object()	sorted()
bin()	enumerate()	input()	oct()	staticmethod()
bool()	eval()	int()	open()	str()
breakpoint()	exec()	isinstance()	ord()	sum()
« bytarray()	filter()	issubclass()	pow()	super()
bytes()	float()	iter()	print()	tuple()
callable()	format()	len()	property()	type()
chr()	frozenset()	list()	range()	vars()
classmethod()	getattr()	locals()	repr()	zip()
compile()	globals()	map()	reversed()	__import__()





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Tipe Data - Numerik

1. Int – bilangan bulat dengan panjang tidak terbatas
2. Long - merupakan long integers (ada pada Python 2, tidak digunakan lagi di Python 3)
3. Float - bilangan pecahan
4. Complex - bilangan kompleks

```
myComplex = 3 + 4j
```

#create a variable with integer value.

```
a=100
```

```
print("The type of variable having value", a, " is ",  
type(a))
```

#create a variable with float value.

```
b=10.2345
```

```
print("The type of variable having value", b, " is ",  
type(b))
```

#create a variable with complex value.

```
c=100+3j
```

```
print("The type of variable having value", c, " is ",  
type(c))
```

```
Python 3.4.4 Shell
File Edit Shell Debug Options Window Help
Python 3.4.4 (v3.4.4:737efcadf5a6, Dec 20 2015, 19:28:18) [MSC v.1600 32 bit (Intel)]
Type "copyright", "credits" or "license()" for more information.
>>>
=====
RESTART: C:/Python34/python_datatypes.py =====
The type of variable having value 100 is <class 'int'>
The type of variable having value 10.2345 is <class 'float'>
The type of variable having value (100+3j) is <class 'complex'>
>>> |
```

Untuk memeriksa tipe data pada suatu variabel, kita bisa menggunakan fungsi type()





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Tipe Data - *String*

1. Char: karakter, contoh 'R'
2. *String*: kumpulan karakter, contoh "aku lagi makan"

```
TERBUKA
nama = "Ivan"
jenis_kelamin = 'L'
alamat = """
    Jl. Suka Karya, No 32. RT Kode,
    Kelurahan Mawar, Jakarta
"""
agama = 'islam'
```

Penulisan tipe data teks harus diapit dengan tanda petik. Bisa menggunakan petik tunggal ('...'), ganda ("...")

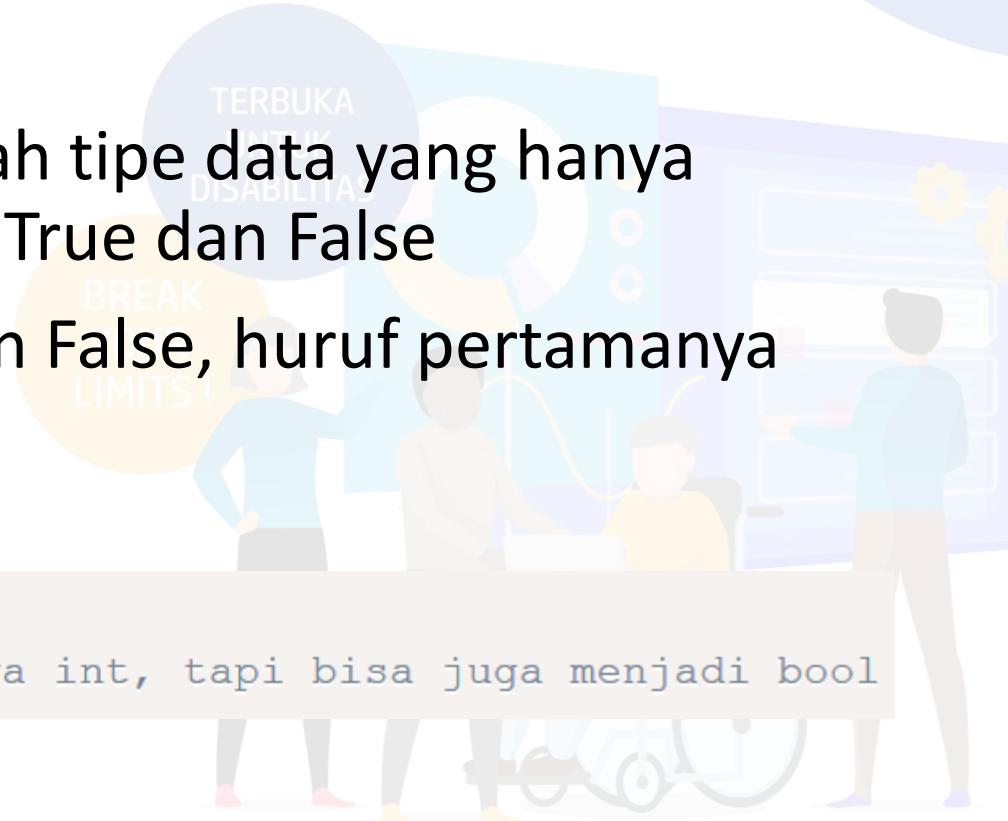


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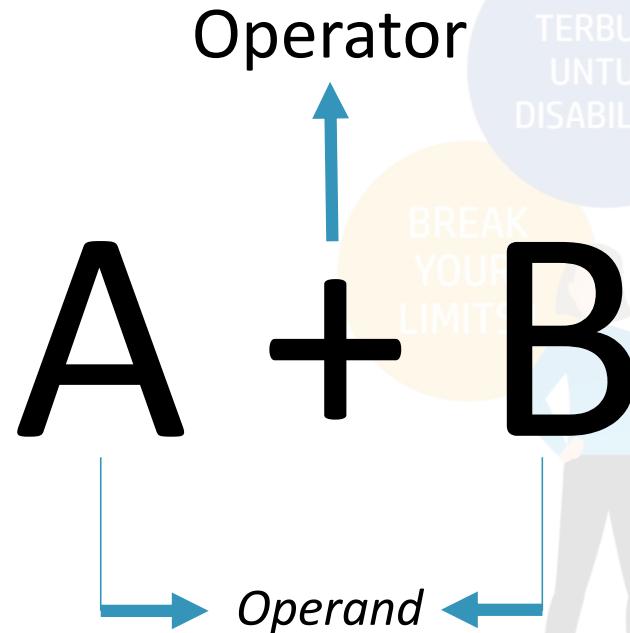
Tipe Data - Boolean

- Tipe data *Boolean* adalah tipe data yang hanya memiliki dua nilai yaitu True dan False
- Pada penulisan True dan False, huruf pertamanya harus kapital

```
bergerak = True
nyala = 1 #sebenarnya tipenya int, tapi bisa juga menjadi bool
```



Operators - Data Manipulation Tools



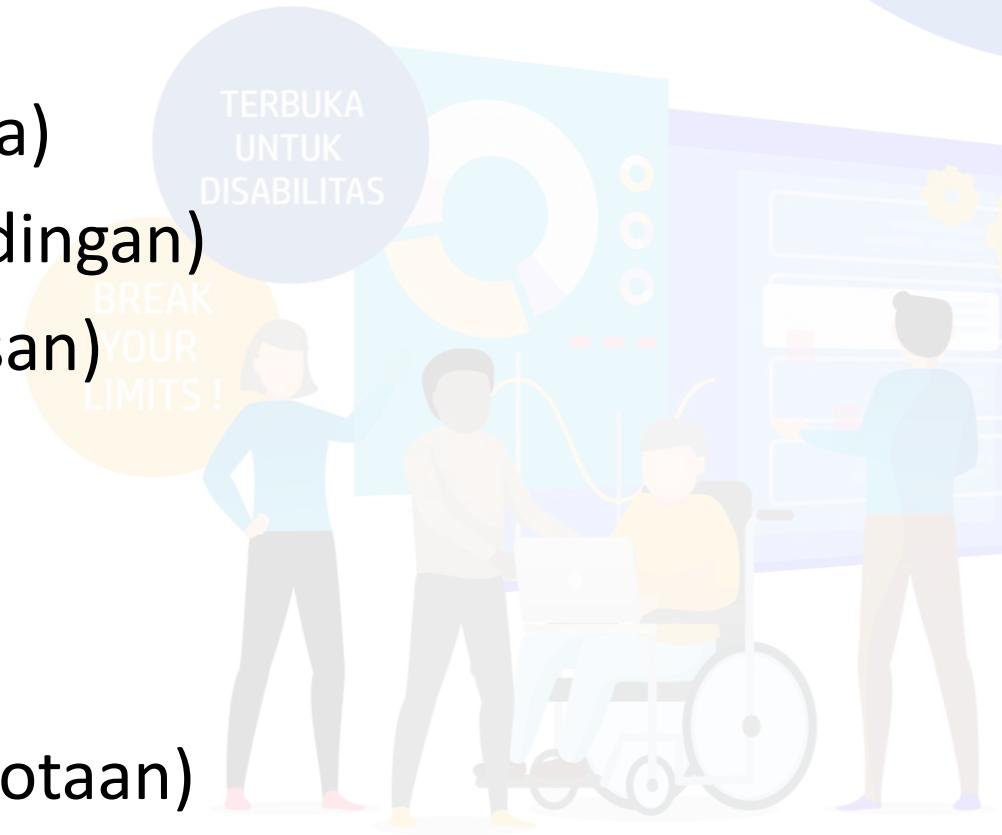
- Ingat: data dan operator ketika dikoneksikan bersama membentuk **expressions**



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Kategori Operator

1. Arithmetic (aritmetika)
2. Comparison (perbandingan)
3. Assignment (penugasan)
4. Logical (logika)
5. Bitwise
6. Identity (identitas)
7. Membership (keanggotaan)





Operator - Arithmetic

Python menyediakan akses ke *library* untuk membantu menyelesaikan perhitungan matematika yang kompleks

Operator	Nama dan Fungsi	Contoh
+	Penjumlahan, menjumlahkan 2 buah operand	$x + y$
-	Pengurangan, mengurangkan 2 buah operand	$x - y$
*	Perkalian, mengalikan 2 buah operand	$x * y$
/	Pembagian, membagi 2 buah operand	x / y
**	Pemangkatan, memangkatkan bilangan	$x ** y$
//	Pembagian bulat, menghasilkan hasil bagi tanpa koma	$x // y$
%	Modulus, menghasilkan sisa pembagian 2 bilangan	$x \% y$



Operator - Comparison

Membandingkan suatu nilai dengan nilai lainnya dan menampilkan hasil perbandingan (True dan False)

Operator	Nama dan Fungsi	Contoh
>	Lebih besar dari – Hasilnya True jika nilai sebelah kiri lebih besar dari nilai sebelah kanan	$x > y$
<	Lebih kecil dari – Hasilnya True jika nilai sebelah kiri lebih kecil dari nilai sebelah kanan	$x < y$
==	Sama dengan – Hasilnya True jika nilai sebelah kiri sama dengan nilai sebelah kanan	$x == y$
!=	Tidak sama dengan – Hasilnya True jika nilai sebelah kiri tidak sama dengan nilai sebelah kanan	$x != y$
>=	Lebih besar atau sama dengan – Hasilnya True jika nilai sebelah kiri lebih besar atau sama dengan nilai sebelah kanan	$x >= y$
<=	Lebih kecil atau sama dengan – Hasilnya True jika nilai sebelah kiri lebih kecil atau sama dengan nilai sebelah kanan	$x <= y$





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Operator – Assignment

Operator
assignment
menempatkan
nilai dalam suatu
variable

Operator	Penjelasan	Contoh
=	Menugaskan nilai yang ada di kanan ke operand yang ada di sebelah kiri	$c = a + b$ menugaskan $a + b$ ke c
+=	Menambahkan operand yang di kanan dengan operand yang ada di kiri dan hasilnya ditugaskan ke operand yang di kiri	$c += a$ sama dengan $c = c + a$
-=	Mengurangi operand yang di kanan dengan operand yang ada di kiri dan hasilnya ditugaskan ke operand yang di kiri	$c -= a$ sama dengan $c = c - a$
*=	Mengalikan operand yang di kanan dengan operand yang ada di kiri dan hasilnya ditugaskan ke operand yang di kiri	$c *= a$ sama dengan $c = c * a$
/=	Membagi operand yang di kanan dengan operand yang ada di kiri dan hasilnya ditugaskan ke operand yang di kiri	$c /= a$ sama dengan $c = c / a$
**=	Memangkatkan operand yang di kanan dengan operand yang ada di kiri dan hasilnya ditugaskan ke operand yang di kiri	$c **= a$ sama dengan $c = c ** a$
//=	Melakukan pembagian bulat operand di kanan terhadap operand di kiri dan hasilnya disimpan di operand yang di kiri	$c //= a$ sama dengan $c = c // a$
%=	Melakukan operasi sisa bagi operand di kanan dengan operand di kiri dan hasilnya disimpan di operand yang di kiri	$c %= a$ sama dengan $c = c \% a$





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Operator – *Logical*

Operator logika adalah operator yang digunakan untuk melakukan operasi logika

Operator	Penjelasan	Contoh
and	Hasilnya adalah True jika kedua operandnya bernilai benar	x and y
or	Hasilnya adalah True jika salah satu atau kedua operandnya bernilai benar	x or y
not	Hasilnya adalah True jika operandnya bernilai salah (kebalikan nilai)	not x





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Operator – *Bitwise*

- Operator bitwise adalah operator yang melakukan operasi bit terhadap operand
- Operator ini beroperasi bit per bit sesuai dengan namanya
- Sebagai misal, angka 2 dalam bit ditulis 10 dalam notasi biner dan angka 7 ditulis 111
- Pada tabel di bawah ini, misalkan $x = 10$ (0000 1010) dalam biner dan $y = 4$ (0000 0100) dalam biner

Operator	Nama	Contoh
&	Bitwise AND	$x \& y = 0$ (0000 0000)
	Bitwise OR	$x y = 14$ (0000 1110)
~	Bitwise NOT	$\sim x = -11$ (1111 0101)
^	Bitwise XOR	$x ^ y = 14$ (0000 1110)
>>	Bitwise right shift	$x >> 2 = 2$ (0000 0010)
<<	Bitwise left shift	$x << 2 = 40$ (0010 1000)

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Operator – Identitas

- Operator identitas adalah operator yang memeriksa apakah dua buah nilai (atau variabel) berada pada lokasi memori yang sama

Operator	Penjelasan	Contoh
is	True jika kedua operand identik (menunjuk ke objek yang sama)	x is True
is not	True jika kedua operand tidak identik (tidak merujuk ke objek yang sama)	x is not True



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Operator – Membership

- Operator keanggotaan adalah operator yang digunakan untuk memeriksa apakah suatu nilai atau variabel merupakan anggota atau ditemukan di dalam suatu data (string, list, tuple, set, dan dictionary)

Operator	Penjelasan	Contoh
in	True jika nilai/variabel ditemukan di dalam data	5 in x
not in	True jika nilai/variabel tidak ada di dalam data	5 not in x



Operator Precedence

Jika bekerja dengan multiple operator, penting untuk menentukan operator mana yang diproses pertama kali

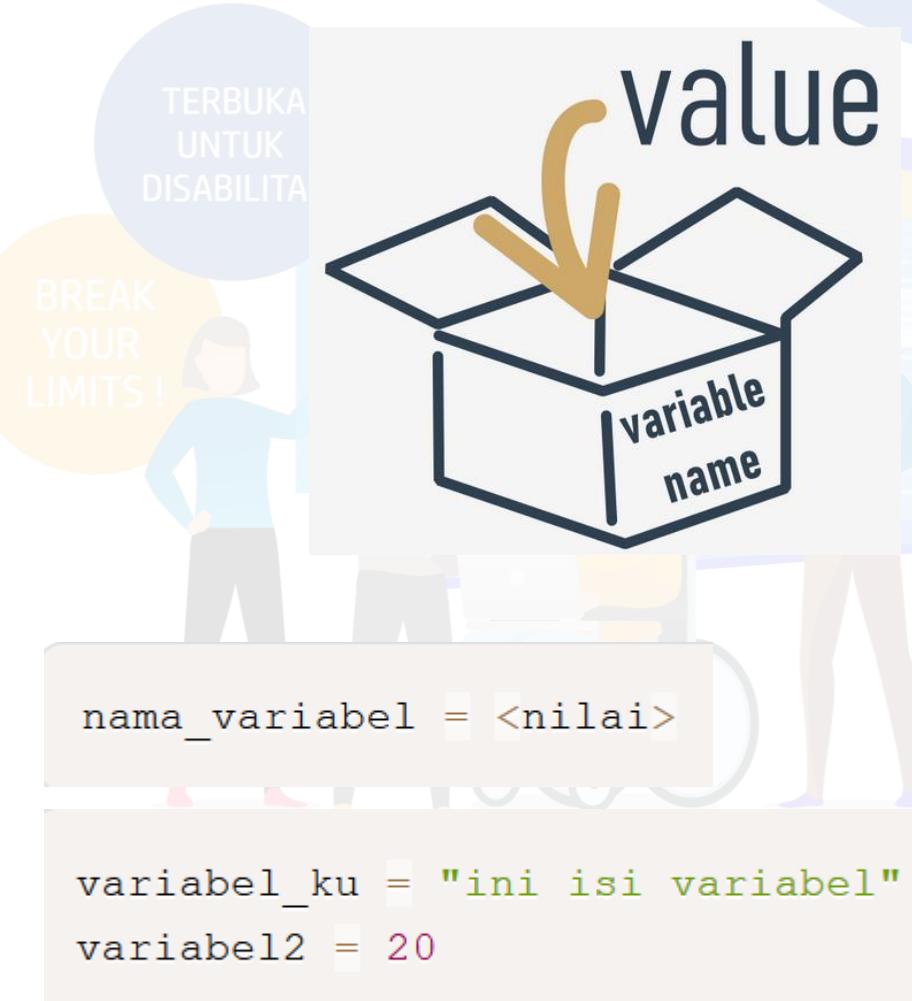
Table 6-9

Python Operator Precedence

<i>Operator</i>	<i>Description</i>
()	You use parentheses to group expressions and to override the default precedence so that you can force an operation of lower precedence (such as addition) to take precedence over an operation of higher precedence (such as multiplication).
**	Exponentiation raises the value of the left operand to the power of the right operand.
~ + -	Unary operators interact with a single variable or expression.
* / % //	Multiply, divide, modulo, and floor division.
+ -	Addition and subtraction.
>> <<	Right and left bitwise shift.
&	Bitwise AND.
^	Bitwise exclusive OR and standard OR.
<= < > >=	Comparison operators.
== !=	Equality operators.
= %= /= //=- += *= **=	Assignment operators.
Is	Identity operators.
is not	
In	Membership operators.
not in	

Variabel dan Tipe Data

- Variabel merupakan tempat menyimpan data, sedangkan tipe data adalah jenis data yang terseimpan dalam variabel.
- Karakter pada nama variabel bersifat **sensitif (*case-sensitive*)**. Artinya huruf besar dan kecil dibedakan. Misalnya, `variabel_Ku` dan `variabel_ku`, keduanya adalah variabel yang berbeda
- Nama variabel tidak boleh menggunakan kata kunci yang sudah ada dalam Python seperti `if`, `while`, `for`, dsb.





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Input Output – Reading Keyboard Input

- Fungsi input ([prompt]) meminta input atau masukan dari *user*
- Bila kita menginput bilangan, misalnya *integer* lewat fungsi `input()`, maka hasil input tersebut adalah *string* dan bukan *integer*. Kita harus mengubahnya terlebih dahulu menjadi tipe *integer* menggunakan fungsi `int()`

```
▶ name = input('Masukkan nama: ')
print(name)
```

Masukkan nama: budi
budi

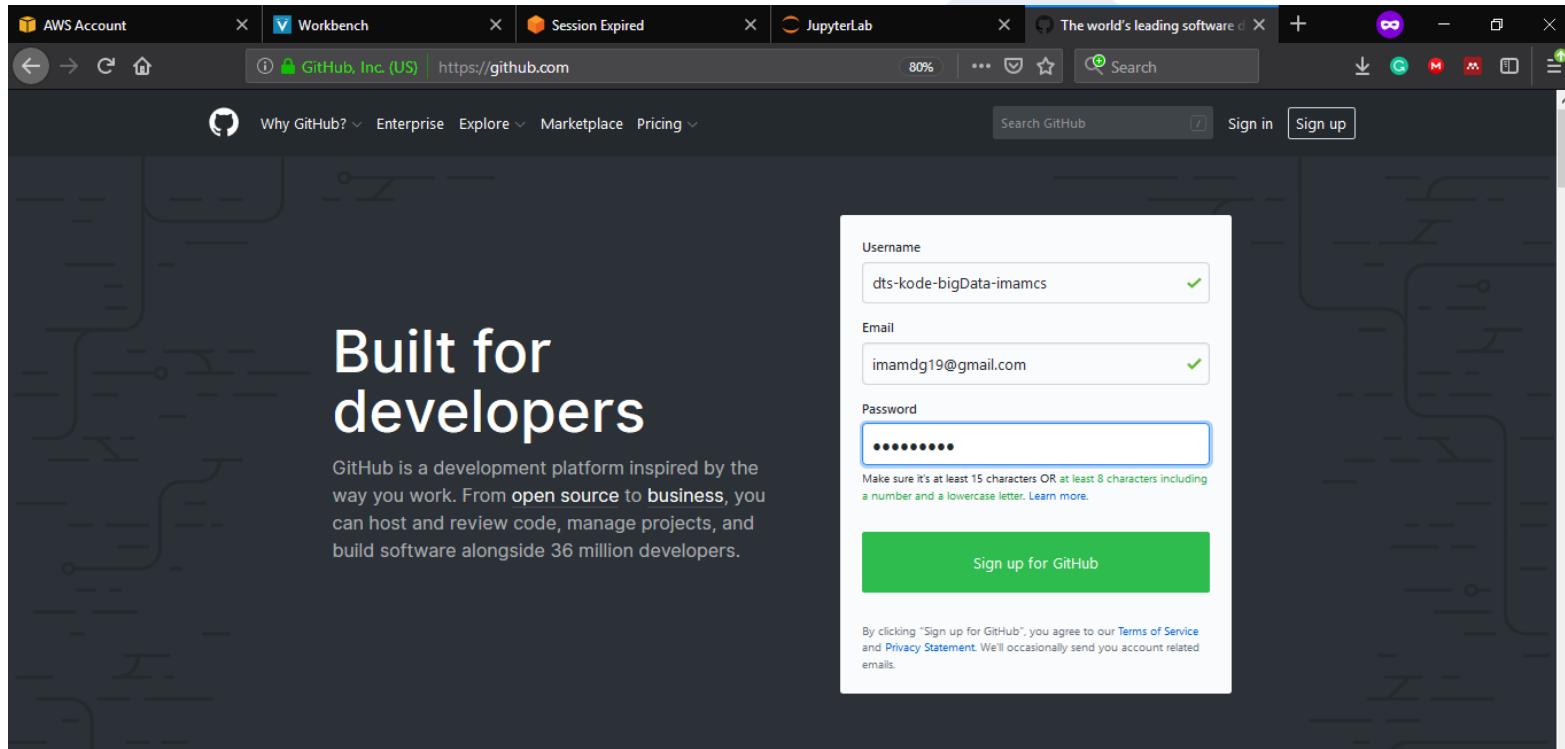
```
▶ panjang = input('Masukkan nilai panjang: ')
lebar = input('Masukkan nilai lebar: ')
luas = int(panjang) * int(lebar)
print("Luas =", luas)
```

Masukkan nilai panjang: 7
Masukkan nilai lebar: 8
Luas = 56



Clone kode dari github ke Jupyter Lab

- Register ke github (jika sudah punya akun github, silahkan langsung login)



Get started with GitHub Enterprise

Take collaboration to the next level with security and administrative features built for businesses.

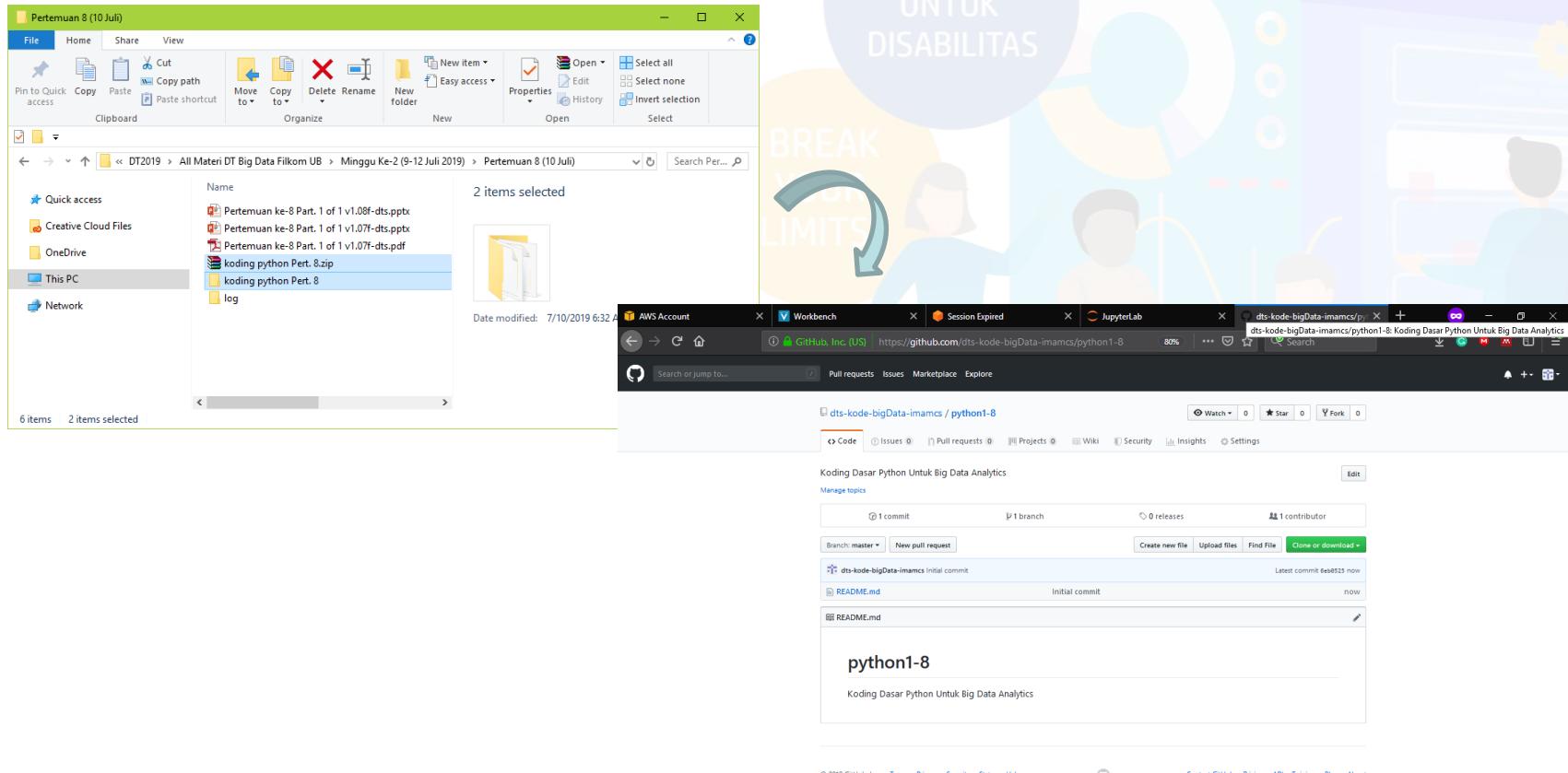
Clone kode dari github ke Jupyter Lab

- Create repository, misal “python1-7”

The screenshot shows a browser window with multiple tabs open, including "AWS Account", "Workbench", "Session Expired", "JupyterLab", and "Create a New Repository". The main content is the "Create a new repository" form on GitHub. The "Repository name" field contains "python1-8". The "Owner" dropdown is set to "dts-kode-bigData-imams" and has a checkmark next to it. The "Description (optional)" field contains "Koding Dasar Python Untuk Big Data Analytics". The "Visibility" section shows "Public" is selected (radio button is filled) and "Private" is unselected. Below that, there's a note about skipping the step if importing an existing repository, and a checked checkbox for "Initialize this repository with a README". At the bottom, there are buttons for "Add .gitignore: None" and "Add a license: None", followed by a large green "Create repository" button.

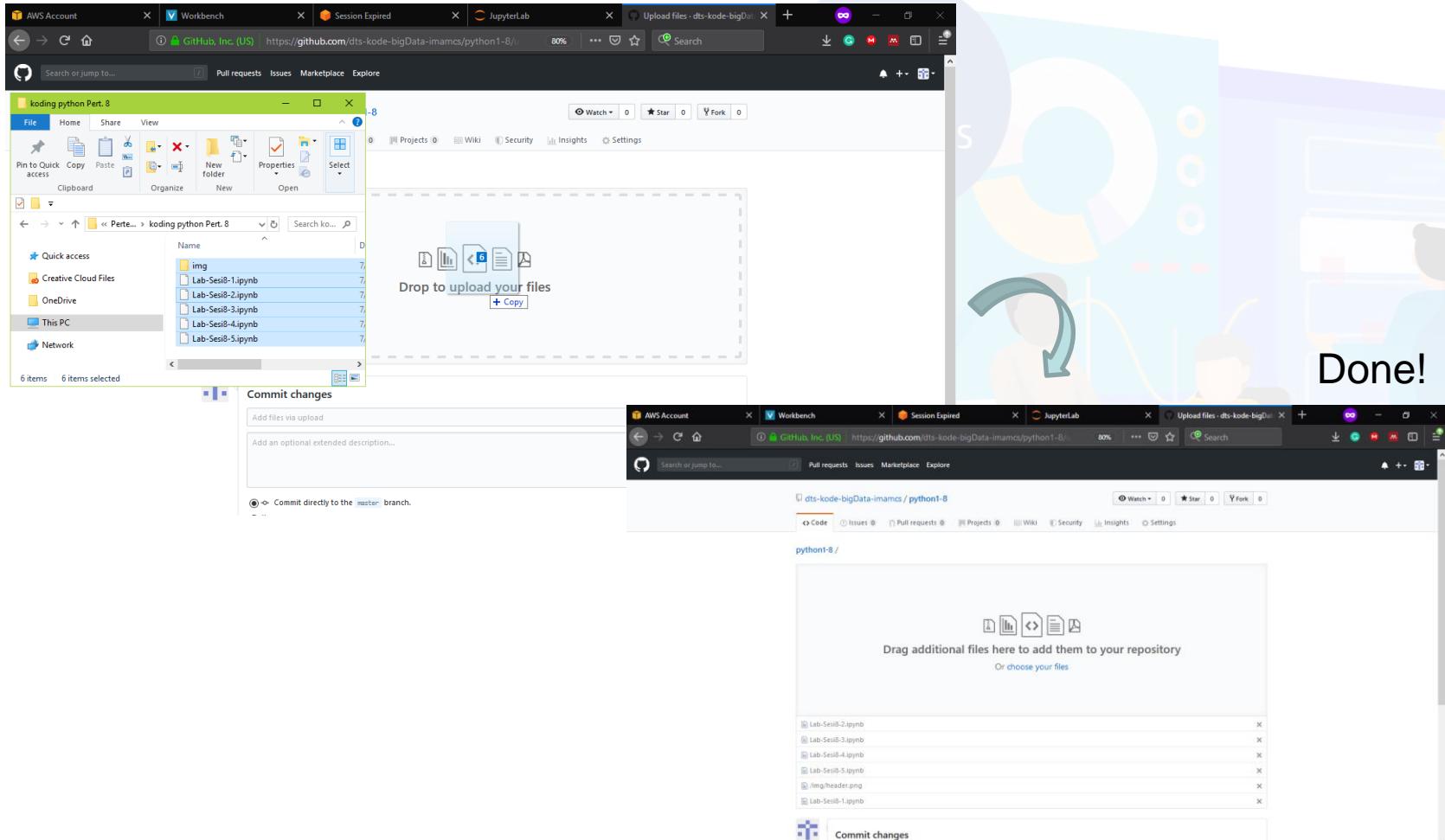
Clone kode dari github ke Jupyter Lab

- Download file “koding python Pert. 7.zip” dari link “<http://bit.ly/2YKicRs>”, lalu ekstrak di lokal komputer anda > Upload hasil ekstrak tersebut ke github Anda > dengan klik “Upload files”



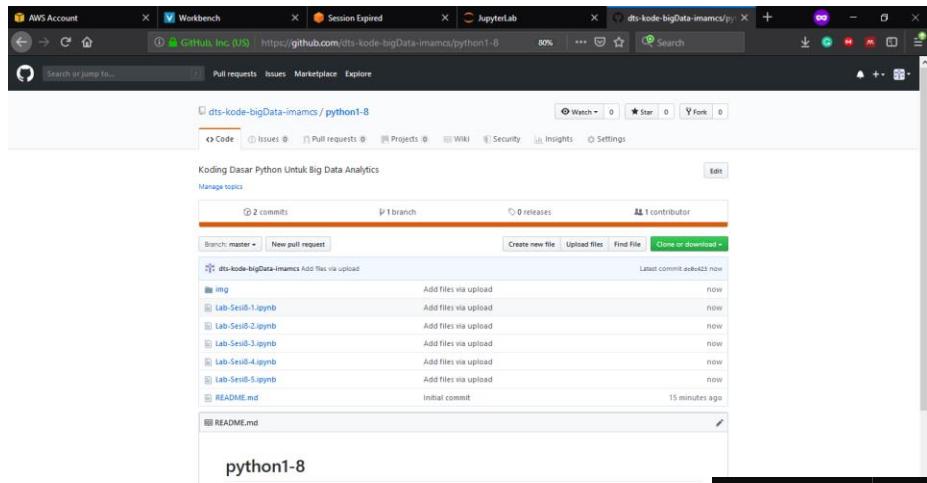
Clone kode dari github ke Jupyter Lab

- Drag & Drop file (tunggu beberapa waktu) > Done > Klik “Commit Change”



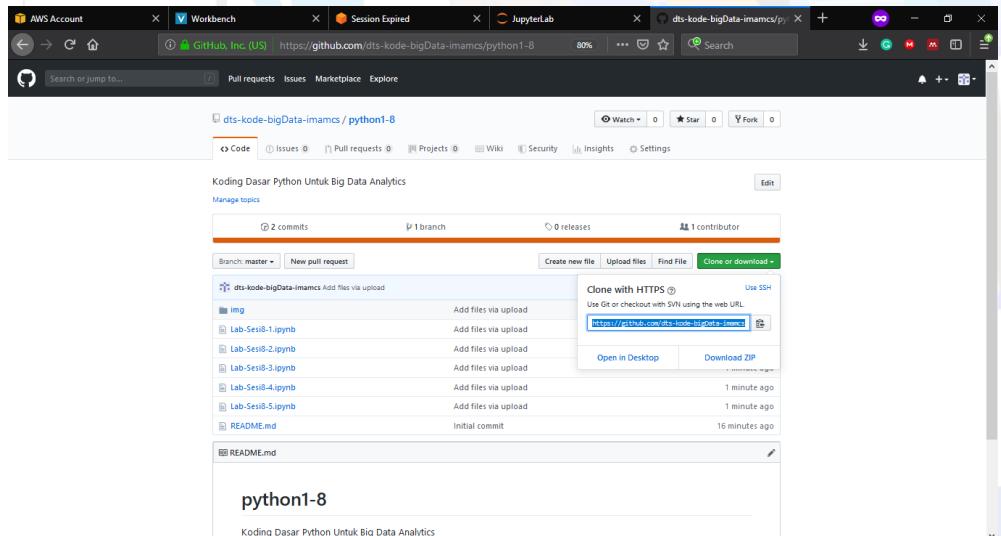
Clone kode dari github ke Jupyter Lab

- Hasil Klik “Commit Change” > Klik “Clone or download”



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DISABILITAS

Copy link yang muncul, misal:
<https://github.com/dts-kode-bigData-imamcs/python1-8.git>



Clone kode dari github ke Jupyter Lab

- Pada JupyterLab, ketikkan “`!git clone https://github.com/dts-kode-bigData-imamcs/python1-8.git`”, lalu tekan shift + enter, maka otomatis koding github Anda sudah ter-clone ke JupyterLab.

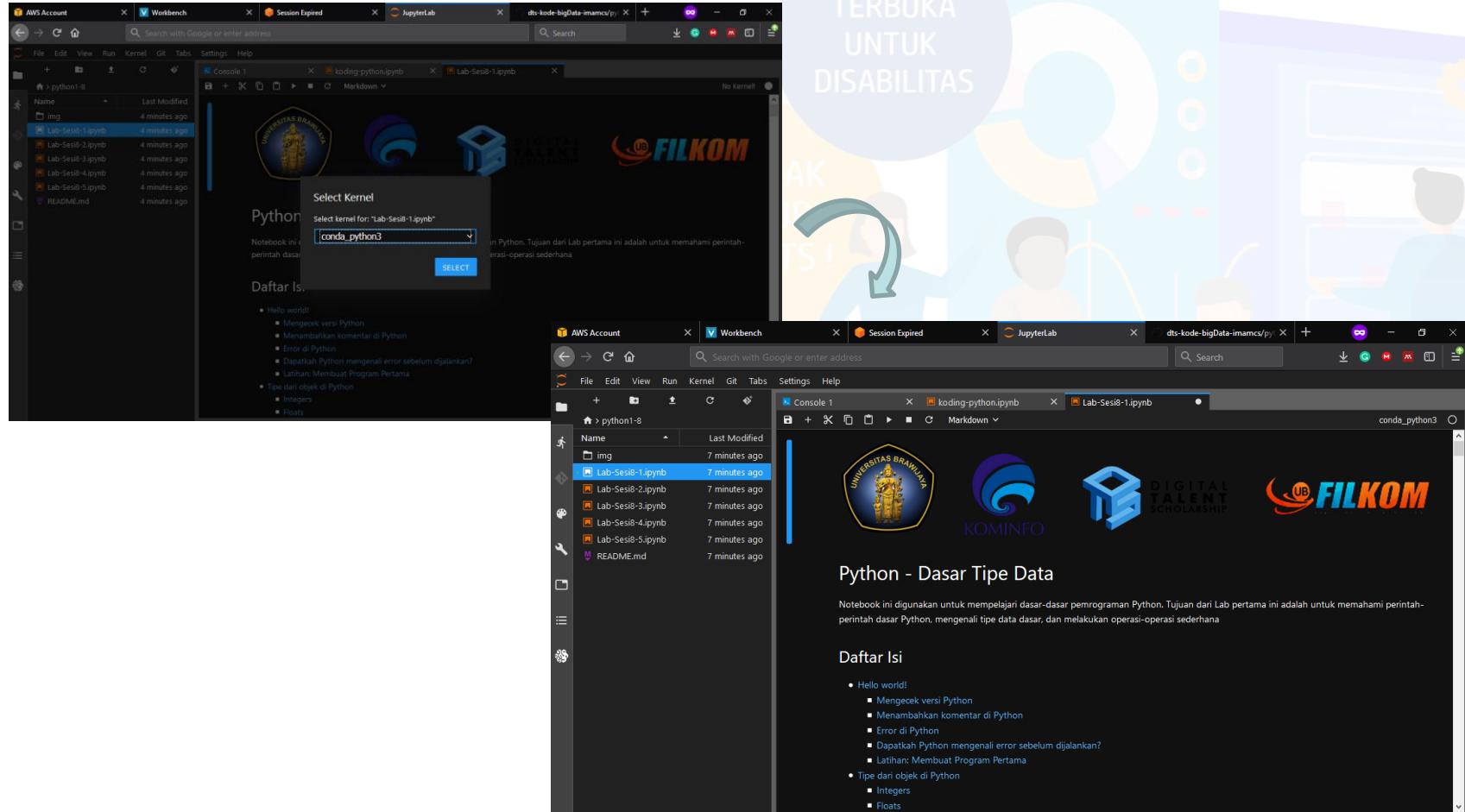
The image shows two side-by-side screenshots of the JupyterLab interface. Both screenshots feature a dark-themed interface with a sidebar containing file and folder icons. The top bar includes tabs for 'AWS Account', 'Workbench', 'Session Expired', and 'JupyterLab'. The main area contains a code editor and a terminal window.

Screenshot 1 (Left): The terminal window shows the command `git clone https://github.com/dts-kode-bigData-imamcs/python1-8.git` being typed. The code editor below has a single cell with the Python code `print('Hello Python')`.

Screenshot 2 (Right): The terminal window shows the command `git clone https://github.com/dts-kode-bigData-imamcs/python1-8.git` completed. The output indicates the repository is cloned into a directory named 'python1-8'. The code editor below shows the same Python code as in Screenshot 1.

Clone kode dari github ke Jupyter Lab

- Pada JupyterLab, buka folder “python1-8”, buka setiap file *.ipynb, dan set dengan kernel “conda_python3” > Klik SELECT. Happy Coding :D





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Latihan langsung di Kelas Ke-1 & Pembahasan

Link kode "<http://bit.ly/2YKicRs>"

Silahkan dicoba dijalankan dengan Jupyter notebook yang Anda buat sebelumnya di Ubuntu 16.04 atau dengan SageMaker notebook (JupyterLab) yang baru Anda buat hari ini.

Lab-Sesi8-1

This screenshot shows the first lab notebook titled "Python - Dasar Tipe Data". It includes logos for Universitas Brawijaya, KOMINFO, Digital Talent Scholarship, and FILKOM. The content covers basic data types in Python, such as strings, lists, tuples, and dictionaries, with a focus on string operations like concatenation, indexing, and slicing. A note at the bottom indicates that the code cell below contains a password-protected section.

Lab-Sesi8-2

This screenshot shows the second lab notebook titled "Operasi String". It continues the theme of string manipulation in Python, including advanced topics like regular expressions and string methods. A note at the bottom indicates that the code cell below contains a password-protected section.

Lab-Sesi8-3

This screenshot shows the third lab notebook titled "Tuples di Python". It introduces tuples and their applications in Python, such as database cursors. A note at the bottom indicates that the code cell below contains a password-protected section.

Lab-Sesi8-4

This screenshot shows the fourth lab notebook titled "Lists in Python". It focuses on list comprehensions and various list operations. A note at the bottom indicates that the code cell below contains a password-protected section.

Lab-Sesi8-5

This screenshot shows the fifth lab notebook titled "Sets pada Python". It introduces sets and their properties in Python, including set comprehension and set operations. A note at the bottom indicates that the code cell below contains a password-protected section.

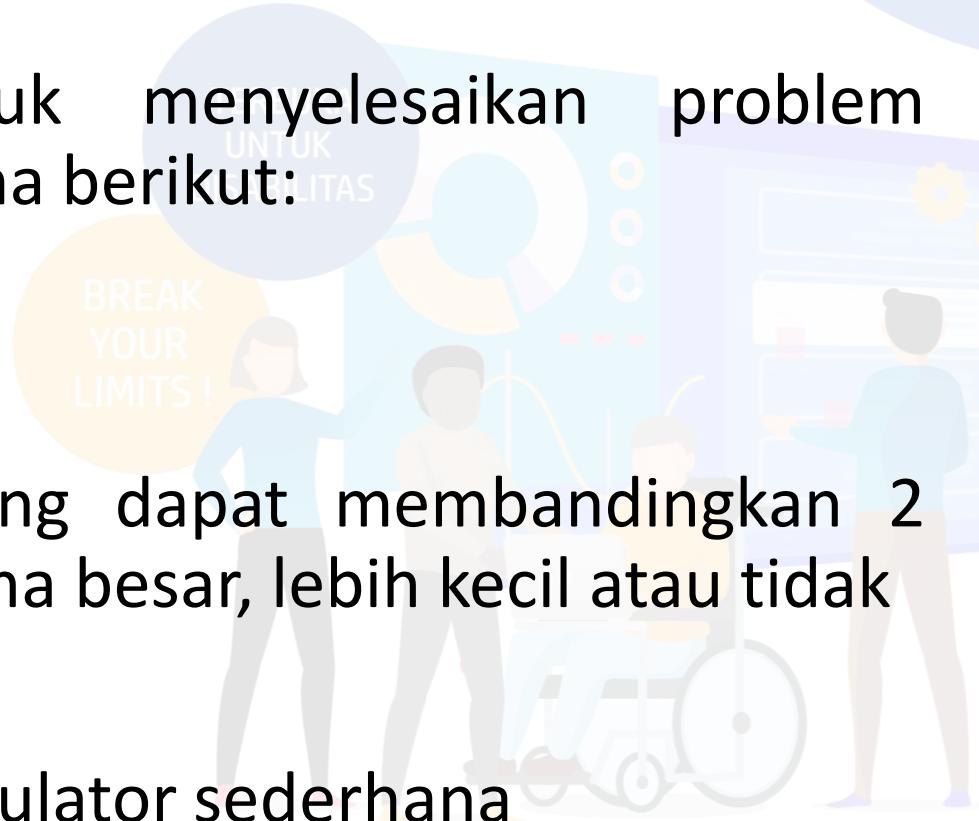


Latihan langsung di Kelas Ke-2 & Pembahasan

1. Buatlah code untuk menyelesaikan problem matematika sederhana berikut:

$$c = \sqrt{a^2 + b^2}$$

2. Buatlah program yang dapat membandingkan 2 buah nilai apakah sama besar, lebih kecil atau tidak
3. Buatlah program Kalkulator sederhana



Cara Stop SageMaker

- Klik “Services” > Pilih “Amazon SageMaker” > Klik “Notebook instances” > Klik simbol lingkaran di samping “SageMaker-imamcs” > Klik “Actions” > Pilih “Stop”

The screenshot shows the AWS SageMaker service dashboard. In the left sidebar, under the 'Notebook' section, 'Notebook instances' is selected. The main area displays a table titled 'Notebook instances' with one row. The row details are: Name (SageMaker-imamcs), Instance (ml.t2.medium), Creation time (Jul 09, 2019 15:12 UTC), Status (InService), and Actions (Open Jupyter | Open JupyterLab). A large circular watermark in the background reads 'TERBUKA UNTUK DISABILITAS'.

This screenshot is similar to the one above, but the 'Actions' dropdown menu for the 'SageMaker-imamcs' instance is open. The 'Stop' option is highlighted with a blue border. Other options visible in the menu include Open Jupyter, Open JupyterLab, Start, Update settings, Add/Edit tags, and Delete.

Tugas Individu

1. Buatlah rangkuman materi di atas dengan cara berikut:

- Lakukan ulang materi di atas seperti di *all* slide, termasuk melampirkan file *.ipynb yang sudah di-convert ke pdf dari hasil “Latihan langsung di Kelas Ke-1 dan Latihan langsung di Kelas Ke-2”

lalu simpan dalam satu file PDF dengan nama file
“[Nama Lengkap Mhs]-[Pert. Ke-2.1/..]”

Dan dari semua tugas dalam 1 minggu di-merger, dengan nama file seperti:
“[Nama Lengkap Mhs]-[Minggu Ke-1/2/..]”, lalu cek plagiasi diturnitin dari hasil merger tersebut

- > Register ke turnitin
- > Masukkan **id class**: 21563495 & **enrool key**: filkomub9302



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Big Data Analytics



Terimakasih

Oleh: Imam Cholissodin | imamcs@ub.ac.id, Putra Pandu Adikara, Sufia Adha Putri

Asisten: Guedho, Sukma, Anshori, Aang dan Gusti

Fakultas Ilmu Komputer (Filkom) Universitas Brawijaya (UB)

Materi Tambahan

- Menyelesaikan course “PY0101EN” pada cognitiveclass.ai --> Optional
 - Module 1 Lab – Write your first Python code!
 - Module 1 Lab – String Operations

