

TUGAS MACHINE LEARNING  
PEMBELAJARAN PHYTON

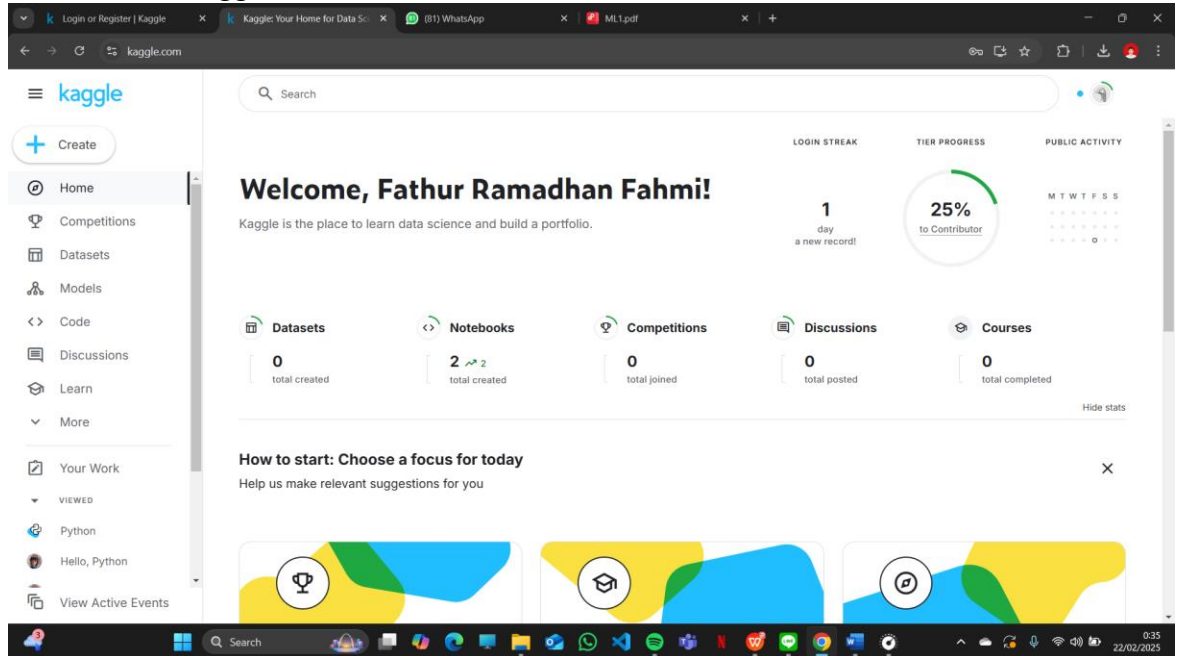


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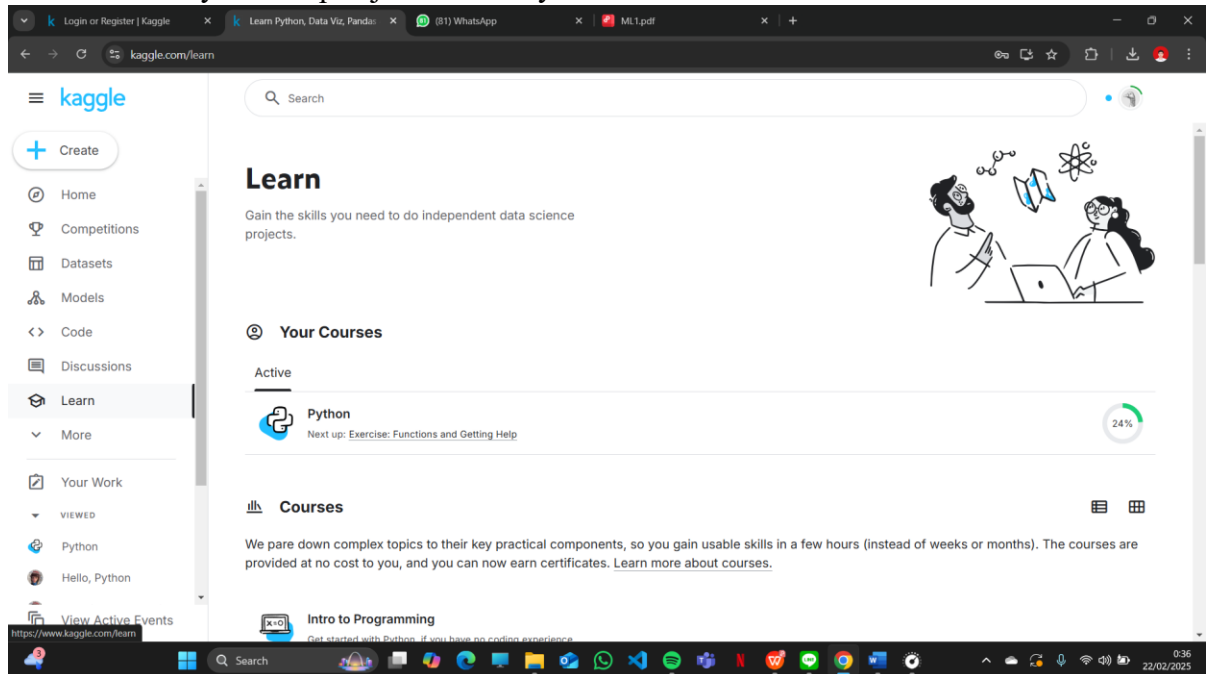
DOSEN PENGAMPU :  
Afdhal Dinilhak, M.Kom.

PROGRAM STUDI INFORMATIKA  
FAKULTAS TEKNOLOGI INFORMASI  
UNIVERSITAS ANDALAS  
2025

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## 5. Hello Python

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Exercise: Syntax, Variables, and Numb... Draft saved

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Write an arithmetic expression below to calculate how many candies they must smash for a given haul.

```

1: # Variables representing the number of candies collected by alice, bob, and carol
   alice_candies = 121
   bob_candies = 77
   carol_candies = 100

   # Your code goes here! Replace the right-hand side of this assignment with an expression
   # involving alice_candies, bob_candies, and carol_candies
   to_smash = (alice_candies + bob_candies + carol_candies) % 3

   # Check your answer
   q4.check()

2: #q4.hint()
   #q4.solution()

```

Keep Going

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## 6. Functions and getting Help

Exercise: Functions and Getting H... Draft saved

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Complete the body of the following function according to its docstring.

HINT: Python has a built-in function `round`.

```

1: def round_to_two_places(num):
   """Return the given number rounded to two decimal places.

   >>> round_to_two_places(3.14159)
   3.14
   >>>

   # Replace this body with your own code.
   # ('pass' is a keyword that does literally nothing. We used it as a placeholder
   # because after we begin a code block, Python requires at least one line of code)
   return round(num, 2)

   # Check your answer
   q1.check()

Correct

```

+ Code + Markdown

```

2: # Uncomment the following for a hint
   #q1.hint()

   # Or uncomment the following to peek at the solution

```

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Exercise: Functions and Getting H... Draft saved

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Put your test code here

```

1: round(10.989, -1)

2: 10.0

```

Can you think of a case where this would be useful? Once you're ready, run the code cell below to see the answer and to receive credit for completing the problem.

```

3: # Check your answer (Run this code cell to receive credit!)
   q2.solution()

```

Solution: As you've seen, `ndigits=-1` rounds to the nearest 10, `ndigits=-2` rounds to the nearest 100 and so on. Where might this be useful? Suppose we're dealing with large numbers:

The area of Finland is 338,424 km<sup>2</sup>  
The area of Greenland is 2,166,086 km<sup>2</sup>

We probably don't care whether it's really 338,424, or 338,425, or 338,177. All those digits of accuracy are just distracting. We can chop them off by calling `round()` with `ndigits=-3`:

The area of Finland is 338,000 km<sup>2</sup>  
The area of Greenland is 2,166,000 km<sup>2</sup>

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Exercise: Functions and Getting H... Draft saved

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Modify it so that it optionally takes a second argument representing the number of friends the candies are being split between. If no second argument is provided, it should assume 3 friends, as before.

Update the docstring to reflect this new behaviour.

```
[11]: def to_smash(total_candies, friend = 3):
    """Return the number of leftover candies that must be smashed after distributing
    the given number of candies evenly between 3 friends.

    ==> to_smash(91)
    1
    """
    return total_candies % friend

# Check your answer
q3.check()
```

Correct

```
[12]: q3.hint()
```

Hint: Refer to the action of the last tutorial notebook where we talked about default arguments

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Exercise: Functions and Getting H... Draft saved

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```
[16]: round_to_two_places(9.9999)
```

```
[16]: 10.0
```

```
[18]: x = -10
y = 5
Which of the two variables above has the smallest absolute value?
smallest_abs = min(x, y, key=abs)
print(smallest_abs)
```

Object 'value' not found.

5

+ Code + Markdown

```
[20]: # def f(x):
#     y = abs(x)
#     return y

# print(f(5))
```

Correct

Output

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## 7. Booleans and Conditionals

Exercise: Booleans and Condition... Draft saved

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Many programming languages have `sign` available as a built-in function. Python doesn't, but we can define our own!

In the cell below, define a function called `sign` which takes a numerical argument and returns -1 if it's negative, 1 if it's positive, and 0 if it's 0.

```
[10]: # Your code goes here. Define a function called 'sign'
def sign(number):
    if number < 0 :
        return 0
    elif number > 0 :
        return 1
    else:
        return -1

# Check your answer
q1.check()
```

Correct

+ Code + Markdown

```
[16]: #q1.solution()
```

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Exercise: Booleans and Condition...

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111:

```
def to_smash(total_candies):
    """Return the number of leftover candies that must be smashed after distributing
    the given number of candies evenly between 3 friends.

    >>> to_smash(91)
    1
    """
    print("Splitting", total_candies, "candies")
    return total_candies % 3

to_smash(91)

Splitting 91 candies
```

112:

1

What happens if we call it with `total_candies = 1`?

113:


```
to_smash(1)

Splitting 1 candies
```

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Exercise: Booleans and Condition...

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119:

```
def to_smash(total_candies):
    """Return the number of leftover candies that must be smashed after distributing
    the given number of candies evenly between 3 friends.

    >>> to_smash(91)
    1
    """
    if total_candies == 1:
        print("Splitting 1 candy")
    else:
        print("Splitting", total_candies, "candies")
    return total_candies % 3

to_smash(91)
to_smash(1)

Splitting 91 candies
Splitting 1 candy
```

120:

1

Code


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To get credit for completing this problem, and to see the official answer, run the code cell below.

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111:

```
def prepared_for_weather(have_umbrella, rain_level, have_hood, is_workday):
    # Don't change this code. Our goal is just to find the bug, not fix it!
    return have_umbrella or rain_level < 5 and have_hood or not rain_level > 0 and is_workday

# Change the values of these inputs so they represent a case where prepared_for_weather
# returns the wrong answer.
have_umbrella = False
rain_level = 0.0
have_hood = False
is_workday = False

# Check what the function returns given the current values of the variables above
actual = prepared_for_weather(have_umbrella, rain_level, have_hood, is_workday)
print(actual)

# Check your answer
q3.check()

False
Correct:
One example of a failing test case is:
have_umbrella = False
rain_level = 0.0
```


112:

1

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the same behaviour.

See if you can come up with an equivalent body that uses just **one line** of code, and put it in the function `concise_is_negative`. (HINT: you don't even need Python's ternary syntax)

[33]:

```
def is_negative(number):
    if number < 0:
        return True
    else:
        return False

def concise_is_negative(number):
    return True if number < 0 else False

# Check your answer
q4.check()
```

Correct

[34]:


```
#q4.hint()
#q4.solution()
```

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5a.

The boolean variables `ketchup`, `mustard` and `onion` represent whether a customer wants a particular topping on their hot dog. We want to implement a number of boolean functions that correspond to some yes-or-no questions about the customer's order. For example:

[35]:

```
def onionless(ketchup, mustard, onion):
    """Return whether the customer doesn't want onions.
    """
    return not onion
```

[36]:

```
def wants_all_toppings(ketchup, mustard, onion):
    """Return whether the customer wants "the works" (all 3 toppings)
    """
    return ketchup and mustard and onion

# Check your answer
q5.a.check()
```

Correct


[37]:

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#q5.a.hint()
#q5.a.solution()

5b.

For the next function, fill in the body to match the English description in the docstring.

[38]:

```
def wants_plain_hotdog(ketchup, mustard, onion):
    """Return whether the customer wants a plain hot dog with no toppings.
    """
    return not (ketchup or mustard or onion)

# Check your answer
q5.b.check()
```

Correct

One solution looks like:

```
return not ketchup and not mustard and not onion
```


We can also "factor out" the nots to get:

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Exercise: Booleans and Condition...

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You know what to do: for the next function, fill in the body to match the English description in the docstring.

```
[40]: def exactly_one_sauce(ketchup, mustard, onion):
      """Return whether the customer wants either ketchup or mustard, but not both.
      (You may be familiar with this operation under the name "exclusive or")
      """
      return (ketchup or mustard) and not (ketchup and mustard)

      # Check your answer
      q5.c.check()
```

Correct

```
[41]: #q5.c.hint()
      #q5.c.solution()
```

6. 🌶


We've seen that calling `bool()` on an integer returns `False` if it's equal to 0 and `True` otherwise. What happens if we call `int()` on a

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Exercise: Booleans and Condition...

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6. 🌶

We've seen that calling `bool()` on an integer returns `False` if it's equal to 0 and `True` otherwise. What happens if we call `int()` on a bool? Try it out in the notebook cell below.

Can you take advantage of this to write a succinct function that corresponds to the English sentence "does the customer want exactly one topping"?

```
[42]: def exactly_one_topping(ketchup, mustard, onion):
      """Return whether the customer wants exactly one of the three available toppings
      on their hot dog.
      """
      return int(ketchup) + int(mustard) + int(onion) == 1

      # Check your answer
      q6.check()
```

Correct

This condition would be pretty complicated to express using just `and`, `or`, and `not`, but using boolean-to-integer conversion gives us this short solution:


```
return (int(ketchup) + int(mustard) + int(onion)) == 1
```

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Exercise: Booleans and Condition...

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Player won 18988 out of 50000 games (win rate = 38.0%)

Our dumb agent that completely ignores the game state still manages to win shockingly often!

Try adding some more smarts to the `should_hit` function and see how it affects the results.

```
[47]: def should_hit(dealer_total, player_total, player_low_aces, player_high_aces):
      """Return True if the player should hit (request another card) given the current game
      state, or False if the player should stay.
      When calculating a hand's total value, we count aces as "high" (with value 11) if doing so
      doesn't bring the total above 21, otherwise we count them as low (with value 1).
      For example, if the player's hand is (A, A, A, 7), we will count it as 11 + 1 + 1 + 7,
      and therefore set player_total=20, player_low_aces=2, player_high_aces=1.
      """
      return False

      q7.simulate(n_games=50000)
```

Player won 18983 out of 50000 games (win rate = 38.0%)


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OK, Got it.

## 8. Lists

Exercise: Lists

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Setup complete.

1.

Complete the function below according to its docstring.

```
[14]: def select_second(L):  
    """Return the second element of the given list. If the list has no second  
    element, return None.  
    """  
    if len(L) > 1:  
        return L[1]  
  
    # Check your answer  
    q1.check()
```

Correct

```
[15]: #q1.hint()
```

Session started.


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Up next

Loops and List Comprehensions

Not now Start Tutorial

Exercise: Lists

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2.

You are analyzing sports teams. Members of each team are stored in a list. The Coach is the first name in the list, the captain is the second name in the list, and other players are listed after that. These lists are stored in another list, which starts with the best team and proceeds through the list to the worst team last. Complete the function below to select the **captain** of the worst team.

```
[16]: def losing_team_captain(teams):  
    """Given a list of teams, where each team is a list of names, return the 2nd player (captain)  
    from the last listed team  
    """  
    return teams[-1][1]  
  
    # Check your answer  
    q2.check()
```

Correct

```
[17]: #q2.hint()  
      #q2.solution()
```

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Loops and List Comprehensions

Not now Start Tutorial

Exercise: Lists

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The next iteration of Mario Kart will feature an extra-inferiating new item, the **Purple Shell**. When used, it warps the last place racer into first place and the first place racer into last place. Complete the function below to implement the Purple Shell's effect.

```
[18]: def purple_shell(racers):  
    """Given a list of racers, set the first place racer (at the front of the list) to last  
    place and vice versa.  
  
    >>> r = ["Mario", "Bowser", "Luigi"]  
    >>> purple_shell(r)  
    >>> r  
    ["Luigi", "Bowser", "Mario"]  
    """  
    racers[0], racers[-1] = racers[-1], racers[0]  
  
    # Check your answer  
    q3.check()
```

Correct

```
[19]: #q3.hint()  
      #q3.solution()
```

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Loops and List Comprehensions

Not now Start Tutorial





Exercise: Strings and Dictionari...

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[24]:

```
c = 'it\'s ok'
length = 7
q0.c.check()
# q0.c.solution()
```

Correct

Even though we use different syntax to create it, the string `c` is identical to `b`. In particular, note that the backslash is not part of the string, so it doesn't contribute to its length.

0d.

[25]:

```
d = """hey"""
length = 3
q0.d.check()
# q0.d.solution()
```


Correct

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Exercise: Strings and Dictionari...

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[26]:

```
e = '\n'
length = 1
q0.e.check()
# q0.e.solution()
```

Correct

The newline character is just a single character! (Even though we represent it to Python using a combination of two characters.)

1.

There is a saying that "Data scientists spend 80% of their time cleaning data, and 20% of their time complaining about cleaning data." Let's see if you can write a function to help clean US zip code data. Given a string, it should return whether or not that string represents a valid zip code. For our purposes, a valid zip code is any string consisting of exactly 5 digits.

HINT: `str` has a method that will be useful here. Use `help(str)` to review a list of string methods.

[27]:


```
def word_search(doc_list, keyword):
```

Notebook

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[27]:

```
def word_search(doc_list, keyword):
    """
    Takes a list of documents (each document is a string) and a keyword.
    Returns list of the index values into the original list for all documents
    containing the keyword.

    Example:
    doc_list = ["The Learn Python Challenge Casino.", "They bought a car", "Casinoville"]
    >>> word_search(doc_list, 'casino')
    >>> [0]
    """
    clean_punctuation = [doc.replace('.', '').replace(',', '') for doc in doc_list]
    tokens = [doc.lower().split() for doc in clean_punctuation]
    return [i for i, doc in enumerate(tokens) if keyword.lower() in doc]

q2.check()
```

Correct

[28]:


```
#q1.hint()
#q1.solution()
```

Notebook

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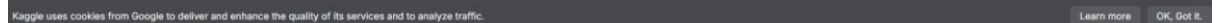
Output (68KiB / 19.5GiB)

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