DICHI
ACADEMY

Dichi Academy
Data Science Module 1 - Data with Python

Conditional Structures

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List of comparison operators

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Python Operator	Mathematics Symbol	Operator Name
<	<	Less than
<=	≤	Less than or equal to
>	>	Greater than
>=	≥	Greater than or equal to
==	=	Equal to
!=	≠	Not equal to

```
# Less than or equal to
print(10 < 10) # False
print(10 <= 10) # True

# Greater than or equal to
print(25 > 15) # True
print(25 >= 15) # False

# Equal to
print(10 == 10) # True
print(5 == 10) # False

# Not equal to
print(25 != 10) # True
print(25 != 25) # False
```

“If” statement

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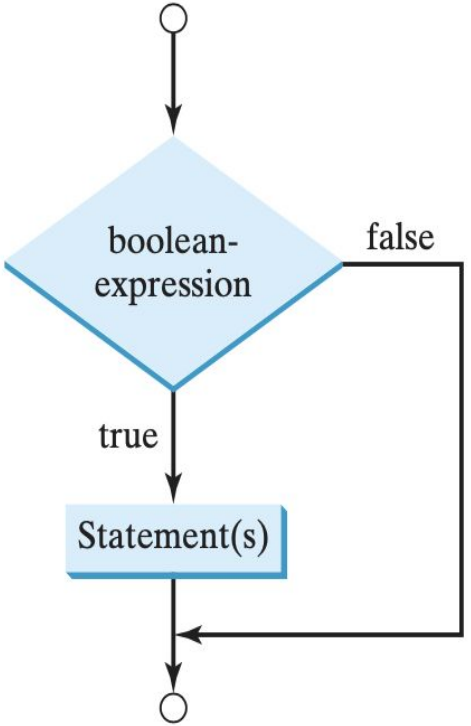
```
if boolean-expression:
    statement(s)-for-the-true-case
```

Condition

One indent



“If” statement

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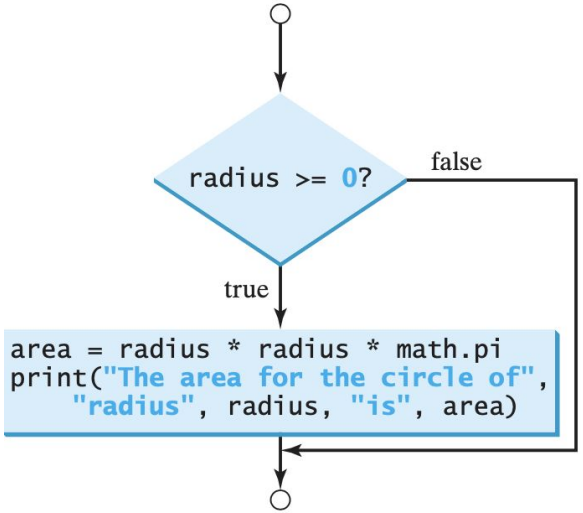
```
if radius >= 0:
    area = radius * radius * math.pi
    print("The area for the circle of radius", radius, "is", area)
```



“If” statement

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```
# if-statement
grade = 80

if grade >= 50:
  print("Congrats! You passed the test!")
```

Practice

Write a program that prompt the user to enter an integer and check whether the integer is positive or negative.

```
# Example 1
Enter an integer: 5
5 is a positive number

# Example 2
Enter an integer: -5
-5 is a negative number
```

“If-else” statement

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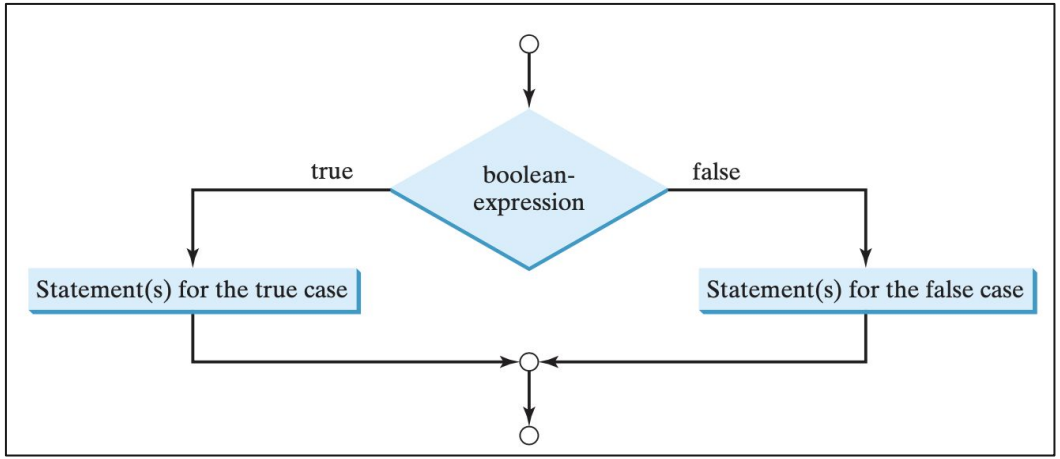
Condition

```
if boolean-expression:
    statement(s)-for-the-true-case
else:
    statement(s)-for-the-false-case
```

One indent



“If-else” statement

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```
# if-statement
grade = 80

if grade >= 50:
  print("Congrats! You passed the test!")
else:
  print("Sorry! You failed the test!")
```

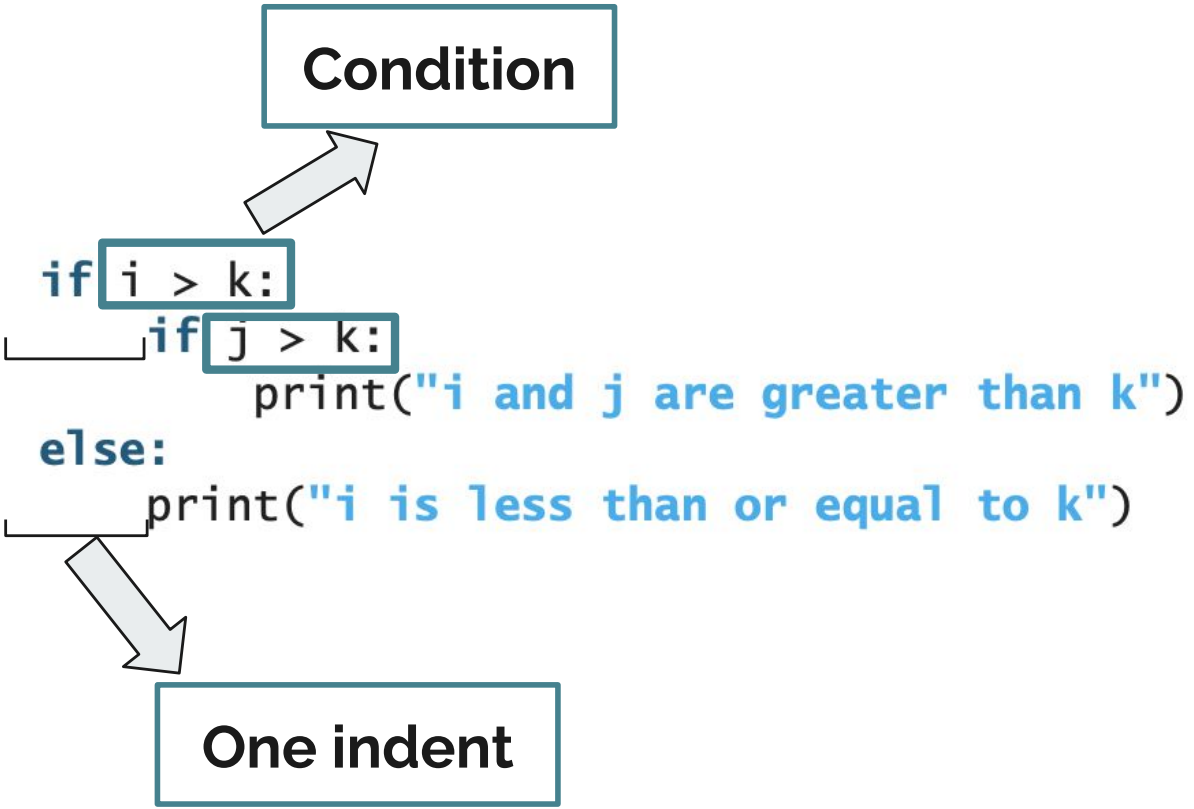
Practice

Write a program that prompt the user to enter an integer and check whether the integer is an odd or even number:

```
# Example 1
Enter an integer: 10
10 is an even number

# Example 2
Enter an integer: 5
5 is an odd number
```

“Nested-if” statement



“Nested-if” statement

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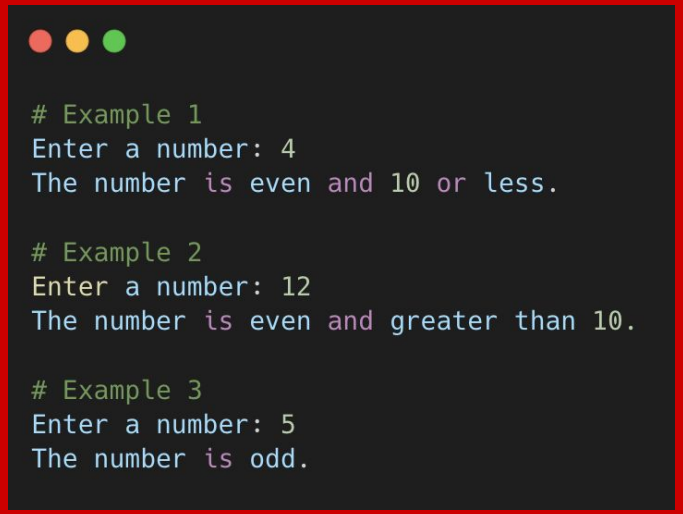
```
# nested-if statement
age = 20
has_id = True

if age >= 18:
    if has_id:
        print("You are eligible to enter.")
    else:
        print("You need an ID to enter.")
else:
    print("You are not old enough to enter.")
```

Practice

Write a program that asks the user to enter a number and print results according to the following conditions:

1. If the number is even or odd,
   print "The number is odd."

2. If the number is even:
   - if the number is greater than 10,
     print "The number is even and greater than 10."
   - If not (The number is smaller than 10),
     print "The number is even and 10 or less."



```
# Example 1
Enter a number: 4
The number is even and 10 or less.

# Example 2
Enter a number: 12
The number is even and greater than 10.

# Example 3
Enter a number: 5
The number is odd.
```

“if-elif-else” statement

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```
if score >= 90.0:
    grade = 'A'
elif score >= 80.0:
    grade = 'B'
elif score >= 70.0:
    grade = 'C'
elif score >= 60.0:
    grade = 'D'
else:
    grade = 'F'
```

Conditions

One indent

“if-elif-else” statement

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```python
# if-elif-else statement
number = -5

if number > 0:
    print("The number is positive.")
elif number < 0:
    print("The number is negative.")
else:
    print("The number is zero.")
```

Practice

Body mass index (BMI) is a measure of health based on weight.

BMI = Weight / (Height*Height)

The interpretation of BMI are as follows:

BMI	Interpretation
Below 18.5	Underweight
18.5–24.9	Normal
25.0–29.9	Overweight
Above 30.0	Obese

Write a program that prompts the user to enter a weight (kg) and height (m) and then displays the BMI interpretation.

Let’s Practise!

Exercise 1: Simple Calculator

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Write a program that prompts the user to enter two numbers and an operation (+, -, *, /).

Based on the operation entered, the program should perform the calculation and display the result.

If the user enters an invalid operation, it should display an error message.

```
# Example 1
Enter the first number: 10
Enter the second number: 5
Enter an operation (+, -, *, /): -

The result is 5

# Example 2
Enter the first number: 10
Enter the second number: 5
Enter an operation (+, -, *, /): @

Error: Invalid operation entered
```

Exercise 2: Discount Calculator

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Write a program that prompts the user to enter the total amount of a purchase. The program should calculate and apply a discount based on the following rules:

- If the amount is over $100, apply a 10% discount.
- If the amount is $100 or less, apply a 5% discount.

The program should then display the final amount after the discount.

```
# Example 1
Enter the total amount of purchase: $50
Final amount after discount: $47.5

# Example 2
Enter the total amount of purchase: $150
Final amount after discount: $135
```

Exercise 3: Income Tax Calculator

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Write a program that prompts the user to enter their annual income and calculates the income tax based on the following tax brackets:

- Income up to $10,000: No tax
- Income from $10,001 to $20,000: 10% tax on the amount above $10,000
- Income from $20,001 to $50,000: $1,000 plus 20% tax on the amount above $20,000
- Income over $50,000: $7,000 plus 30% tax on the amount above $50,000

The program should then display the calculated tax.

```
# Example 1
Enter your annual income: $8,000
Your income tax is: $0.00

# Example 2
Enter your annual income: $15,000
Your income tax is: $500.00

# Example 3
Enter your annual income: $60,000
Your income tax is: $10,000.00
```

Thank You
for
Your Attention!