My Python Course Notes

Structured Revision for Every Lesson

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June 12, 2025

Contents

1   If Else – Decision Making in Python

Q1: Greeting by First Name

Write a program that asks the user for their first name. If the user's name is `Marie` or `Otto`, the program should print `Hello Marie!` or `Hello Otto!` respectively. Otherwise, nothing should be printed. Leading and trailing spaces should be ignored. The input and output must match the following examples exactly.

Example 1:
First name: Marie
Hello Marie!

Example 2:
First name: Karl
(No output expected)

Q1 – Solution

```python
name = input("First name: ").strip()

if name == "Marie":
    print("Hello Marie!")
elif name == "Otto":
    print("Hello Otto!")
```

Q2: Compare Two Floating-Point Numbers

Write a program that asks the user to input two floating-point numbers, a and b. Use an `if-else` statement to determine and print the larger number.

Example:
a = 10
b = 11.2
The larger number is: 11.2

Q2 – Solution

```python
a = float(input("a = "))
b = float(input("b = "))

if a > b:
    print("The larger number is:", a)
else:
    print("The larger number is:", b)
```

Q3: Compare with a Single if Statement

Solve the previous task again, but this time using only a single `if` statement without `else`. The input and output must match the example exactly.

Example:
```
a = 10
b = 11.2
The larger number is: 11.2
```

Q3 – Solution

```python
1  a = float(input("a = "))
2  b = float(input("b = "))
3
4  if b > a:
5      print("The larger number is:", b)
6  if a > b:
7      print("The larger number is:", a)
```

Q4: Largest of Three Numbers

Write a program that asks the user to input three floating-point numbers: a, b, and c. Then determine and print the largest number.

Example:
```
a = 10
b = 11.2
c = -12.31
The largest number is: 11.2
```

Q4 – Solution

```python
1   a = float(input("a = "))
2   b = float(input("b = "))
3   c = float(input("c = "))
4
5   if a >= b and a >= c:
6       print("The largest number is:", a)
7   elif b >= a and b >= c:
8       print("The largest number is:", b)
9   else:
10      print("The largest number is:", c)
```

Q5: Age-Based Classification (if-elif-else)

Write a program that asks the user for their age and prints a message based on the following rules:

- Under 18: You are a minor.

- Between 18 and 65: You are an adult.

- 66 and older: You are of retirement age.

Example 1:
```
Please enter your age: 23
You are an adult.
```

Example 2:
```
Please enter your age: 13
You are a minor.
```

Q5 − Solution

```python
1  age = int(input("Please enter your age: "))
2
3  if age < 18:
4      print("You are a minor.")
5  elif age <= 65:
6      print("You are an adult.")
7  else:
8      print("You are of retirement age.")
```

Q6: Age-Based Classification with Extended Range

Write a program similar to Q5 but with the following additional condition:

- Under 18: `You are a minor.`

- Between 18 and 65: `You are an adult.`

- Between 66 and 99: `You are of retirement age.`

- 100 or older: `You are in the Methuselah age group.`

Example:
```
Please enter your age: 101
You are in the Methuselah age group.
```

Q6 − Solution

```python
1   age = int(input("Please enter your age: "))
2
3   if age < 18:
4       print("You are a minor.")
5   elif age <= 65:
6       print("You are an adult.")
7   elif age <= 99:
8       print("You are of retirement age.")
9   else:
10      print("You are in the Methuselah age group.")
```

Q7: Min and Max from Input Without Using min/max

Write a program that asks the user to enter a list of integers separated by commas. Then determine and print the smallest and largest number without using the built-in `min()` or `max()` functions.

Example:
```
Enter numbers: 1, 3, 7, -4, 9, 0, 2
Smallest number: -4
Largest number: 9
```

Q7 – Solution

```python
raw_input = input("Enter numbers: ")
numbers = [int(x.strip()) for x in raw_input.split(",")]

smallest = numbers[0]
largest = numbers[0]

for num in numbers[1:]:
    if num < smallest:
        smallest = num
    if num > largest:
        largest = num

print("Smallest number:", smallest)
print("Largest number:", largest)
```

2   Match Statement – Pattern Matching in Python

Q1: Weekday Abbreviation to Full Name

Write a program that asks the user to input a weekday abbreviation (2 letters), such as Mo, Di, Mi, etc. The program should return the full weekday name. If the input is invalid, print Error. Use a match statement to solve this.

Example 1:
Input: Mo
Monday

Example 2:
Input: Mon
Error

Q1 – Solution

```python
day = input("Input: ").strip()

match day:
    case "Mo":
        print("Monday")
    case "Di":
        print("Tuesday")
    case "Mi":
        print("Wednesday")
    case "Do":
        print("Thursday")
    case "Fr":
        print("Friday")
    case "Sa":
        print("Saturday")
    case "So":
        print("Sunday")
    case _:
        print("Error")
```

Q2: Month Abbreviation to Season

Write a program that asks the user to enter a three-letter month abbreviation (e.g., Jan, Feb).
The input should be case-insensitive. The program should return the corresponding season:

- Spring: Mar–May

- Summer: Jun–Aug

- Autumn: Sep–Nov

- Winter: Dec–Feb

Invalid input should return `Error`. Use a `match` statement with as few `case` blocks as possible
(5 total).

Example:
Input: Feb
Winter

Q2 – Solution

```python
month = input("Input: ").strip().lower()

match month:
    case "mar" | "apr" | "may":
        print("Spring")
    case "jun" | "jul" | "aug":
        print("Summer")
    case "sep" | "oct" | "nov":
        print("Autumn")
    case "dec" | "jan" | "feb":
        print("Winter")
    case _:
        print("Error")
```

Q3: Rewrite if-elif-else Using match

Given the following code:

```python
val = int(input('Value: '))
if val >= 0 and val < 4:
print('Small number')
elif val < 6:
print('Medium number')
elif val == 7 or val == 9:
print('Special number')
else:
print('Some other number')
```

Rewrite the program using a `match` statement instead of `if-elif-else` to achieve the same logic
and output.

Q3 − Solution

```python
val = int(input("Value: "))

match val:
    case 0 | 1 | 2 | 3:
        print("Small number")
    case 4 | 5:
        print("Medium number")
    case 7 | 9:
        print("Special number")
    case _:
        print("Some other number")
```

3 The for Loop − Counting, Iteration, and Containers

Q1: Count from 1 to a User-Defined Value

Write a program that asks the user to input a number. Then use a `for` loop to print all numbers from 1 to the entered value.

Example:
```
Last count value: 4
1
2
3
4
```

Q1 − Solution

```python
n = int(input("Last count value: "))
for i in range(1, n + 1):
    print(i)
```

Q2: Count Down to 1

Repeat the previous task, but count down from the input value to 1, using a step of -1.

Example:
```
Last count value: 4
4
3
2
1
```

Q2 − Solution

```
1  n = int(input("Last count value: "))
2  for i in range(n, 0, -1):
3      print(i)
```

Q3: Factorial with a for Loop

Write a program that calculates the factorial of a user-given number n. Use a for loop starting at 1.

Example:
```
Please enter n: 4
n! = 24
```

Q3 – Solution

```
1  n = int(input("Please enter n: "))
2  factorial = 1
3  for i in range(1, n + 1):
4      factorial *= i
5  print("n! =", factorial)
```

Q4: Count Occurrences of a Character in a String

Write a program that asks the user for a string and counts how many times the letter e appears using a for loop.

Example:
```
Input: Das Leben ist schoen!
Number of e: 3
```

Q4 – Solution

```
1  text = input("Input: ")
2  count = 0
3  for char in text:
4      if char == 'e':
5          count += 1
6  print("Number of e:", count)
```

Q5: Sum All Elements in a List

Given the list:

```
intlist = [1, 4, 3, 7, -5, 3, 5]
```

Write a program that uses a for loop to sum all elements and print the result.

Output:
```
Sum: 18
```

Q5 – Solution

```python
intlist = [1, 4, 3, 7, -5, 3, 5]
total = 0
for number in intlist:
    total += number
print("Sum:", total)
```