

## PRACTICE SHEET

### What you will learn:

Type Casting & Data Types, Working with Unicode & ASCII, File Extensions, Bitwise & Arithmetic Operators, System-Level Python (Audio Control).

[EASY] Q1. Which of the following is true about Python's type casting? [GATE 2018]

- a) Implicit type casting is not allowed
- b) Explicit type casting is mandatory
- c) Both implicit and explicit type casting are supported
- d) Type casting is not supported

[EASY] Q2. What will be the output of: [GATE 2017]

```
print(bool("False") == False)
```

- a) True
- b) False
- c) Error
- d) None

[EASY] Q3. What is the output of the following code?

```
print(int('0b1010', 2) + int('A', 16))
```

- a) 10
- b) 20
- c) 26
- d) 21

[EASY] Q4. Which of the following is NOT true about Python scripts?

- a) A .py file can be run using the python command in terminal
- b) Python files can include HTML and markdown by default
- c) A .py file only contains executable Python code
- d) Python scripts can import external libraries using import

[MEDIUM] Q5. Write a program to tell whether a given 3-digit number is an Armstrong number (sum of each digit raised to the power 3 is equal to the number) or not. Also, give a proper error message if the number given as input is not a 3-digit number.

EXAMPLE

Input: 371

Output: Yes

Explanation:  $3^3 + 7^3 + 1^3 = 371$

[MEDIUM] Q6. Print all Unicode characters from U+0900 to U+0905 (Devanagari block).

Output: ॐ ँ ॐ ँ ॐ ँ ॐ ँ ॐ ँ

[EASY] Q7. Write a program that takes a filename and prints its file type based on extension.

[MEDIUM] Q8. Convert an ASCII value to corresponding character without using `ord()` or `chr()`. Can you convert a character to an ASCII value?

[MEDIUM] Q9. Chef will have N guests in his house today. He wants to serve at least one dish to each of the N guests. Chef can make two types of dishes. He needs one fruit and one vegetable to make the first type of dish and one vegetable and one fish to make the second type of dish. Now Chef has A fruits, B vegetables, and C fishes in his house. Can he prepare at least N dishes in total? Take single line of input, four integers N,A,B,C. Print "YES" if Chef can prepare at least N dishes, otherwise print "NO". Print the output without quotes.

Input: 3 2 2 2

Output: NO

Explanation: Chef prepares two dishes of the first type using two fruit and two vegetable. Now all the vegetables are exhausted, hence he can't prepare any other dishes.

[MEDIUM] Q10. You are given two integers N and K. You may perform the following operation any number of times (including zero): change N to N-K, i.e. subtract K from N. Find the smallest non-negative integer value of N you can obtain this way. Input contains two space-separated integers N and K. Print single line containing one integer - the smallest value you can get.

Input 1 : 5 2                      Output 1 : 1

Input 2 : 4 4                      Output 2 : 0

Input 3: 2 5                      Output 3 : 2

[MEDIUM] Q11. You and your friend are playing a game with hoops. There are N hoops (where N is odd) in a row. You jump into hoop 1, and your friend jumps into hoop N. Then you jump into hoop 2, and after that, your friend jumps into hoop N-1, and so on.

The process ends when someone cannot make the next jump because the hoop is occupied by the other person. Find the last hoop that will be jumped into. Input is single integer N.

[EASY] Q12. Type cast a float like 10.75 to integer and back to float, then print their difference (e.g.,  $10.75 \rightarrow 10 \rightarrow 10.0 \rightarrow \text{diff} = 0.75$ ).

[HARD] Q13. Write a **pseudo-code** for converting an image into ASCII art. Describe how you can process an image and map it to ASCII characters for different brightness levels.

[MEDIUM] Q14. Write a Python program to swap two variables without using temporary variable. Use arithmetic operator or bitwise operator.

[HARD] Q15. Exploratory Programming Task

### "Controlling System Volume Through Characters"

You are given the task of designing a creative interface where a **single alphabetic character (A-Z, a-z)** is used to **control the system volume** of a Windows machine.

Each character corresponds to a specific **ASCII value**. Based on the value, the system volume should be adjusted as follows:

- **ASCII 56–75** → Volume set to **30%**
- **ASCII 76–90** → Volume set to **50%**
- **ASCII 91–122** → Volume set to **90%**

**Task:**

1. **Is it possible** to programmatically change the **system volume** based on character input?
2. **If yes**, explore and explain:
  - Which **libraries or modules** are required in Python?
  - How to read and process ASCII values of input characters?
  - How to **set the system master volume** from a Python script?
3. Write a **Python script** that:
  - Accepts a single character.
  - Computes its ASCII value.
  - Sets the system volume accordingly.

**Hint:** Investigate Python packages such as pycaw and ctypes for Windows-based audio control using COM interfaces.

**Note:** Ensure you run your script with appropriate permissions and on a Windows machine.

**Template:**

```
from ctypes import cast, POINTER
```

```
from comtypes import CLSCTX_ALL
```

```
from pycaw.pycaw import AudioUtilities, IAudioEndpointVolume
```

```
def set_windows_volume(percent):
```

```
    devices = AudioUtilities.GetSpeakers()
```

```
    interface = devices.Activate(IAudioEndpointVolume._iid_, CLSCTX_ALL, None)
```

```
    volume = cast(interface, POINTER(IAudioEndpointVolume))
```

```
    scalar = percent / 100
```

```
volume.SetMasterVolumeLevelScalar(scalar, None)
```

```
print(f"Volume set to {percent}%")
```