

# CONTENTS

PREFACE .....	1
Purpose and Audience .....	1
Structure and Content.....	1
Why Python?.....	1
Acknowledgements .....	1
Conclusion .....	1
Contents .....	2
Python programming Handbook .....	6
What is Programming? .....	6
What is Python? .....	6
Features of Python .....	6
Installation .....	6
Chapter 1 – Modules, Comments & pip .....	7
Modules .....	7
pip .....	7
Types of Modules .....	7
Using python as a calculator .....	7
Comments .....	7
Types of Comments .....	7
Chapter 1 – Practice Set.....	9
Chapter 2 – Variables and Datatype .....	10
Data Types .....	10
Rules for choosing an identifier .....	10
Operators in Python .....	10
type() function and typecasting.....	11
input() Function .....	11
Chapter 2 – Practice Set.....	12
Chapter 3 – Strings .....	13
String Slicing.....	13
Slicing With Skip Value .....	14
String Functions.....	14
Escape Sequence Characters.....	15
Chapter 3 – Practice Set.....	16
Chapter 4 – Lists And Tuples .....	17
List Indexing .....	17

List methods.....	17
Tuples in Python .....	17
Tuple Methods.....	17
Chapter 4 - Practice Set .....	19
Chapter 5 – Dictionary & Sets .....	20
Properties of Python Dictionaries.....	20
Dictionary Methods.....	20
Sets in Python.....	20
Properties of Sets.....	21
Operations on sets.....	21
Chapter 5 – Practice Set.....	22
Chapter 6 – Conditional Expression .....	23
If Else and Elif in Python.....	23
Code example. ....	23
Relational Operators .....	24
Logical Operators .....	24
Elif clause.....	24
Important notes: .....	24
Chapter 6 – Practice Set.....	25
Chapter 7 – Loops in Python .....	26
Types of Loops in Python .....	26
While loop .....	26
For loop.....	27
range() Function in Python .....	27
An Example Demonstrating range() function. ....	27
For Loop with Else.....	27
The Break Statement .....	27
The Continue Statement.....	28
Pass statement.....	28
Chapter 7 – Practice Set.....	29
Chapter 8 – Functions & Recursions .....	30
Example and syntax of a function .....	30
Function call.....	30
Function Definition .....	30
Types of Functions in Python .....	30
Functions with Arguments .....	30
Default Parameter Value .....	31

Recursion .....	31
Chapter 8 – Practice Set.....	33
Project 1: Snake, Water, Gun Game.....	34
Chapter 9 – File I/O .....	35
Type of Files.....	35
Opening a File.....	35
Reading a File in Python.....	35
Other methods to read the file. ....	36
Modes of opening a file.....	36
Write Files in Python.....	36
With Statement.....	36
Chapter 9 – Practice Set.....	37
Chapter 10 - Object Oriented Programming .....	38
Class.....	38
Object .....	38
Modelling a problem in OOPs.....	38
Class Attributes .....	38
Instance attributes.....	39
self parameter .....	39
static method .....	39
__init__() constructor.....	40
Chapter 10 – Practice Set.....	41
Chapter 11 - Inheritance & more on OOPs.....	42
Types of Inheritance.....	42
Single Inheritance .....	42
Multiple Inheritance .....	43
Multilevel Inheritance.....	43
super() method .....	43
class method.....	44
@property Decorators .....	44
@.getters and @.setters .....	44
Operator Overloading in Python .....	44
Chapter 11- Practice set .....	46
Project 2 – The Perfect Guess .....	47
Chapter 12 – Advanced Python 1 .....	48
Newly added features in python.....	48
Walrus Operator .....	48

Types Definitions in Python .....	48
Advanced Type Hints .....	48
Match Case .....	49
Dictionary Merge & Update Operators .....	49
Exception handling in Python .....	50
Raising Exceptions .....	50
try with else clause .....	50
try with finally .....	51
If <code>__name__ == '__main__'</code> in python .....	51
The global keyword .....	51
enumerate function in python .....	51
List comprehensions .....	51
Chapter 12 – Practice set .....	52
Chapter 13 – Advanced Python 2 .....	53
Virtual enviroinment.....	53
Installation .....	53
pip freeze command .....	53
Lambda functions .....	53
join method (strings) .....	54
format method (strings).....	54
Map, Filter & Reduce .....	54
Chapter 13 – Practice Set.....	56
MEGA Project 1: Jarvis .....	57
Features .....	57
Workflow .....	57
Libraries Used.....	58
Mega Project 2: Auto Reply AI Chatbot .....	59
Description.....	59
Features .....	59
Workflow .....	59
Libraries Used.....	60

## CHAPTER 1 – PRACTICE SET

1. Write a program to print Twinkle twinkle little star poem in python.
2. Use REPL and print the table of 5 using it.
3. Install an external module and use it to perform an operation of your interest.
4. Write a python program to print the contents of a directory using the os module.  
Search online for the function which does that.
5. Label the program written in problem 4 with comments.

CodeWithHarry

## CHAPTER 2 – PRACTICE SET

1. Write a python program to add two numbers.
2. Write a python program to find remainder when a number is divided by z.
3. Check the type of variable assigned using input () function.
4. Use comparison operator to find out whether 'a' given variable a is greater than 'b' or not. Take a = 34 and b = 80
5. Write a python program to find an average of two numbers entered by the user.
6. Write a python program to calculate the square of a number entered by the user.

CodeWithHarry

## CHAPTER 3 – PRACTICE SET

1. Write a python program to display a user entered name followed by Good Afternoon using input () function.
2. Write a program to fill in a letter template given below with name and date.

```
letter = '''
Dear <|Name|>,
You are selected!
<|Date|>
'''
```

3. Write a program to detect double space in a string.
4. Replace the double space from problem 3 with single spaces.
5. Write a program to format the following letter using escape sequence characters.

```
letter = "Dear Harry, this python course is nice. Thanks!"
```

## CHAPTER 5 – PRACTICE SET

1. Write a program to create a dictionary of Hindi words with values as their English translation. Provide user with an option to look it up!
2. Write a program to input eight numbers from the user and display all the unique numbers (once).
3. Can we have a set with 18 (int) and '18' (str) as a value in it?
4. What will be the length of following set s:

```
s = set()
s.add(20)
s.add(20.0)
s.add('20') # length of s after these operations?
```

5. s = {}  
What is the type of 's'?
6. Create an empty dictionary. Allow 4 friends to enter their favorite language as value and use key as their names. Assume that the names are unique.
7. If the names of 2 friends are same; what will happen to the program in problem 6?
8. If languages of two friends are same; what will happen to the program in problem 6?
9. Can you change the values inside a list which is contained in set S?

```
s = {8, 7, 12, "Harry", [1,2]}
```



## CHAPTER 6 – PRACTICE SET

1. Write a program to find the greatest of four numbers entered by the user.
2. Write a program to find out whether a student has passed or failed if it requires a total of 40% and at least 33% in each subject to pass. Assume 3 subjects and take marks as an input from the user.
3. A spam comment is defined as a text containing following keywords: “Make a lot of money”, “buy now”, “subscribe this”, “click this”. Write a program to detect these spams.
4. Write a program to find whether a given username contains less than 10 characters or not.
5. Write a program which finds out whether a given name is present in a list or not.
6. Write a program to calculate the grade of a student from his marks from the following scheme:  
90 – 100 => Ex  
80 – 90 => A  
70 – 80 => B  
60 – 70 => C  
50 – 60 => D  
<50 => F
7. Write a program to find out whether a given post is talking about “Harry” or not.

## CHAPTER 7 – PRACTICE SET

1. Write a program to print multiplication table of a given number using for loop.
2. Write a program to greet all the person names stored in a list 'l' and which starts with S.  
`l = ["Harry", "Soham", "Sachin", "Rahul"]`
3. Attempt problem 1 using while loop.
4. Write a program to find whether a given number is prime or not.
5. Write a program to find the sum of first n natural numbers using while loop.
6. Write a program to calculate the factorial of a given number using for loop.
7. Write a program to print the following star pattern.

```
*  
***  
***** for n = 3
```

8. Write a program to print the following star pattern:

```
*  
**  
*** for n = 3
```

9. Write a program to print the following star pattern.

```
* * *  
* * for n = 3  
* * *
```

10. Write a program to print multiplication table of n using for loops in reversed order.

## CHAPTER 8 – PRACTICE SET

1. Write a program using functions to find greatest of three numbers.
2. Write a python program using function to convert Celsius to Fahrenheit.
3. How do you prevent a python print() function to print a new line at the end.
4. Write a recursive function to calculate the sum of first n natural numbers.
5. Write a python function to print first n lines of the following pattern:  
\*\*\*  
\*\* - for n = 3  
\*  
  
6. Write a python function which converts inches to cms.
7. Write a python function to remove a given word from a list and strip it at the same time.
8. Write a python function to print multiplication table of a given number.

## CHAPTER 10 – PRACTICE SET

1. Create a class “*Programmer*” for storing information of few programmers working at Microsoft.
2. Write a class “*Calculator*” capable of finding square, cube and square root of a number.
3. Create a class with a class attribute a; create an object from it and set ‘a’ directly using ‘object.a = 0’. Does this change the class attribute?
4. Add a static method in problem 2, to greet the user with hello.
5. Write a Class ‘Train’ which has methods to book a ticket, get status (no of seats) and get fare information of train running under Indian Railways.
6. Can you change the self-parameter inside a class to something else (say “harry”). Try changing self to “slf” or “harry” and see the effects.

## CHAPTER 13- PRACTICE SET

1. Create two virtual environments, install few packages in the first one. How do you create a similar environment in the second one?
2. Write a program to input name, marks and phone number of a student and format it using the format function like below:  
  
“The name of the student is Harry, his marks are 72 and phone number is 99999888”
3. A list contains the multiplication table of 7. write a program to convert it to vertical string of same numbers.

7  
14  
.  
.  
.

4. Write a program to filter a list of numbers which are divisible by 5.
5. Write a program to find the maximum of the numbers in a list using the reduce function.
6. Run pip freeze for the system interpreter. Take the contents and create a similar virtualenv.
7. Explore the ‘Flask’ module and create a web server using Flask & Python.