

Course: Programming, Data Structures And Algorithms Using Python

Course Code: noc21-cs67

Session: 2020-21

Duration: 8 Weeks

Assessment procedures: Weekly Assignment (25%) + proctored certification Exam (75%)

Curriculum of the Course:

Week 1

Informal introduction to programming, algorithms and data structures via gcd

Downloading and installing Python

gcd in Python: variables, operations, control flow - assignments, condition-als, loops, functions

Week 2

Python: types, expressions, strings, lists, tuples

Python memory model: names, mutable and immutable values

List operations: slices etc

Binary search

Inductive function definitions: numerical and structural induction

Elementary inductive sorting: selection and insertion sort

In-place sorting

Week 3

Basic algorithmic analysis: input size, asymptotic complexity, $O()$ notation

Arrays vs lists

Merge sort

Quicksort

Stable sorting

Week 4

Dictionaries

More on Python functions: optional arguments, default values

Passing functions as arguments

Higher order functions on lists: map, iter, list comprehension

Week 5

Exception handling

Basic input/output

Handling files

String processing

Week 6

Backtracking: N Queens, recording all solutions

Scope in Python: local, global, nonlocal names

Nested functions

Data structures: stack, queue

Heaps

Week 7

Abstract datatypes

Classes and objects in Python

"Linked" lists: find, insert, delete

Binary search trees: find, insert, delete

Height-balanced binary search trees

Week 8

Efficient evaluation of recursive definitions: memoization

Dynamic programming: examples

Other programming languages: C and manual memory management

Other programming paradigms: functional programming

List of students enrolled

S. No	Name of Student
1	Bhanu Pratap Singh
2	Harsh Kumar
3	Akshat Gupta
4	Akshi Jain
5	Aman Bhargava
6	Anshu Verma
7	Archita Gocher
8	Arun Singh
9	Aryan
10	Ashutosh Tiwari
11	Avinash Mittal
12	Ayush Jangir
13	Bhanupriya Panwar
14	Yogesh Sharma
15	Charu Tiwari
16	Cherrisha Sharma
17	Deepanshu Maheshwari
18	Somu Dey
19	Dhruv Nirwan
20	Darshika Maheshwari
21	Gaurav Mehta
22	Harsh Kumar Sahu

23	Shubham Jain
24	Jayesh Soni
25	Jitendra Agrawal
26	Kaushal
27	Khushi Garg
28	Gaurav Sharma
29	Laxita Singh
30	Lokendra Singh Tanwar
31	Manali Sharma
32	Mohit Chahar
33	Monay Chhattani
34	Neha
35	Nicky Lakhisarani
36	Pankaj Dadheech
37	Akshat Pareek
38	Aditya Rawat
39	Prafull Bhargava
40	Rohit Kumar
41	Ritesh Sharma
42	Aman Saini
43	Jagrati Sharma
44	Shray Mathur
45	Shubham Soni
46	Somil Jain
47	Sonu Saini
48	Ritik Sharma
49	Suraj Sharma
50	Sumit Gupta
51	Manmath Narain Tiwari
52	Vinit Kumar Shah
53	Vishal Bothra
54	Yash Saini