**Dedicated to**

RAdm S. M. Sharma(Retd.) and Mrs Kavita Sharma – Who believed in me when I didn’t believe in myself, my source of strength and encouragement.

**Acknowledgement**

This book is a dream come true for me as I always wanted to write a book for school children. I would like to thank Team BPB for believing in my abilities and giving me this opportunity. I hope that I am able to impart valuable information to the readers and make them fall in love with computer science and Python.

**Preface,**

This book has been designed for Class XII students appearing for CBSE’s **Computer Science with Python** (083) board exam. It has been designed as per the new revised syllabus. The book explains all the topics in detail along with examples. It covers all the topics for Term1 and Term 2 class XII board exams. The content of this book is divided into three Units as shown below:

**Unit I: Computational Thinking and Programming – 2**

Chapter 1 Functions

Chapter 2 Recursion

Chapter 3 Files

Chapter 4 Efficiency Ideas

Chapter 5 Stack and Queues

**Unit II: Computer Networks**

Chapter 1 Evolution of Networking

Chapter 2 Data Communication Terminologies

Chapter 3 Network Devices

Chapter 4 Network Topologies Types

Chapter 5 Network Protocol

Chapter 6 Mobile Telecommunication Technology

Chapter 7 Introduction to Web Services

**Unit III: Database Management**

Chapter 1 Database Concepts

Chapter 2 Working with Queries

Chapter 3 Joins

Chapter 4 MySQL for Python

**Syllabus**

**TERM 1:**

**Unit I: Computational Thinking and Programming – 2**

∙ Revision of Python topics covered in Class XI.

∙ Functions: types of function (built-in functions, functions defined in module, user defined functions), creating user defined function, arguments and parameters, default parameters, positional parameters, function returning value(s), flow of execution, scope of a variable (global scope, local scope)

∙ Introduction to files, types of files (Text file, Binary file, CSV file), relative and absolute paths

∙ Text file: opening a text file, text file open modes (r, r+, w, w+, a, a+), closing a text file, opening a file using with clause, writing/appending data to a text file using write() and writelines(), reading from a text file using read(), readline() and readlines(), seek and tell methods, manipulation of data in a text file

∙ Binary file: basic operations on a binary file: open using file open modes (rb, rb+, wb, wb+, ab, ab+), close a binary file, import pickle module, dump() and load() method, read, write/create, search, append and update operations in a binary file

∙ CSV file: import csv module, open / close csv file, write into a csv file using csv.writerow() and read from a csv file using csv.reader( ) TERM 2: Unit I: Computational Thinking and Programming – 2

∙ Data Structure: Stack, operations on stack (push & pop), implementation of stack using list.

**Unit II: Computer Networks**

● Evolution of networking: introduction to computer networks, evolution of networking (ARPANET, NSFNET, INTERNET)

● Data communication terminologies: concept of communication, components of data communication (sender,receiver, message, communication media, protocols), measuring capacity of communication media (bandwidth, data transfer rate), IP address, switching techniques (Circuit switching, Packet switching)

● Transmission media: Wired communication media (Twisted pair cable, Co-axial cable, Fiber-optic cable), Wireless media (Radio waves, Micro waves, Infrared waves

● Network devices (Modem, Ethernet card, RJ45, Repeater, Hub, Switch, Router, Gateway, WIFI card)

● Network topologies and Network types: types of networks (PAN, LAN, MAN, WAN), networking topologies (Bus, Star, Tree)

● Network protocol: HTTP, FTP, PPP, SMTP, TCP/IP, POP3, HTTPS, TELNET, VoIP

● Introduction to web services: WWW, Hyper Text Markup Language (HTML), Extensible Markup Language (XML), domain names, URL, website, web browser, web servers, web hosting

**Unit III: Database Management**

∙ Database concepts: introduction to database concepts and its need

∙ Relational data model: relation, attribute, tuple, domain, degree, cardinality, keys (candidate key, primary key, alternate key, foreign key)

∙ Structured Query Language: introduction, Data Definition Language and Data Manipulation Language, data type (char(n), varchar(n), int, float, date), constraints (not null, unique, primary key), create database, use database, show databases, drop database, show tables, create table, describe table, alter table (add and remove an attribute, add and remove primary key), drop table, insert, delete, select, operators (mathematical, relational and logical), aliasing, distinct clause, where clause, in, between, order by, meaning of null, is null, is not null, like, update command, delete command

∙ Aggregate functions (max, min, avg, sum, count), group by, having clause, joins : Cartesian product on two tables, equi-join and natural join

∙ Interface of python with an SQL database: connecting SQL with Python, performing insert, update, delete queries using cursor, display data by using fetchone(), fetchall(), rowcount, creating database connectivity applications

**About the author**

Meenu Kohli is the author of “Python Interview Questions”, “Basic Core Python Programming” and “Advance Core Python Programming”. A B.E. (Electronics) from D.Y. Patil College of Engineering, Pune University, she has worked extensively as a Software Developer, Tester, and Trainer in reputed MNCs. She has experience of working on challenging projects across varied development environments such as Python, Java, EJB, C, C++, PHP, JSP, JavaScript, HTML, .NET, R, MySQL, Oracle, DB2. She is a keen observer and passionate learner. In addition to software development, she is also a professionally trained software tester and a certified Six Sigma Green Belt from the National Institute of Industrial Engineering – Mumbai. She has experience of teaching Electronics and Computer Science undergraduate students and has also imparted her knowledge to several software-development courses. She later diversified into writing technical books primarily related to Python.