KANDULA SRINIVASA REDDY MEMORIAL COLLEGE OF ENGINEERING
(AUTONOMOUS)

KADAPA-516003. AP

(Approved by AICTE, Affiliated to JNTUA, Ananthapuramu, Accredited by NAAC)

(An ISO 9001-2008 Certified Institution)

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CERTIFICATION COURSE
ON

"Python for Everybody"

Resource Person   : 1. Dr. M.V. Rathnamma, Associate Professor, Dept. of CSE, KSRMCE

                             2. Mr. Y. Bhaskar Reddy, Assistant Professor, Dept. of CSE, KSRMCE

Course Coordinator: Dr. N. Ramanjaneya Reddy, Associate Professor, Dept. of CSE, KSRMCE

Duration: 20/01/2020 to 06/02/2020

K.S.R.M. COLLEGE OF ENGINEERING

(UGC - AUTONOMOUS)

Kadapa, Andhra Pradesh, India - 516003

Approved by AICTE, New Delhi & Affiliated to JNTUA, Ananthapuramu.

An ISO 14001:2004 & 9001: 2015 Certified Institution

Lr./KSRMCE/ (Department of CSE)/2019-20

Date: 10/01/2020

To
The Principal
KSRM College of Engineering
Kadapa, AP.

Sub: KSRMCE - (Department of CSE) – Permission to conduct certification course on Python for Everybody - Requested – reg.
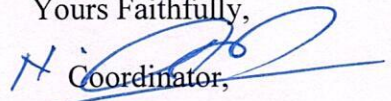
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Respected Sir,

    With reference to the cited, the Department of CSE is planning to conduct certificate course on "Python for Everybody" for B.Tech students from 20/01/2020 to 06/02/2020. So I request you to grant permission to conduct the certificate course. This is submitted for your kind perusal.

Thanking you sir,

Yours Faithfully,

Forwarded to the principal Sir,

Coordinator,
Dr. N. Ramanjaneya Reddy
Associate Professor,
CSE Dept.,

Cc:

To The Director for Information

To All Deans/HODs

Permitted
V. S. S. Murthy
10/01/2020

Dated: 11/01/2020

Circular

All the B.Tech students are here by informed that department of Computer Science & Engineering is going to organize certification course on "**Python for Everybody**" from 20/01/2020 to 06/02/2020. Interested students do register their names with the below mentioned coordinator on or before 17/01/2020, PM.

For any queries contact,

Coordinator:

Dr. N. Ramanjaneya Reddy
Associate Professor,
CSE Dept.,

HoD

Dr. M. Sreenivasulu,
M. E., Ph. D.
Professer & HOD CSE
K.S.R.M. College of Engineering
KADAPA - 516 003

Cc to:

The Management /Director / All Deans / All HODS/Staff / Students for information

The IQAC Cell for Documentation

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Kadapa, Andhra Pradesh, India - 516003
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An ISO 14001:2004 & 9001: 2015 Certified Institution

Date: 1⦿/01/2020

Department of Computer Science & Engineering
Certificate Course on Python for Everybody 20/01/2020 to 06/02/2020
Registered Student List

S.No.	Roll Number	NAME OF THE STUDENT	Year & Branch	Email id

Coordinator   HoD

K.S.R.M. COLLEGE OF ENGINEERING

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Ananthapuramu.

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Date: 11/01/2020

Department of Computer Science & Engineering
Certificate Course on Python for Everybody 20/01/2020 to 06/02/2020
Registered Student List

S.No.	Roll Number	NAME OF THE STUDENT	Year & Branch	Signature of the student
1	179Y1A0529	Chilakala Mahammadrafi	B-Tech VI sem	Rafi
2	189Y/A0507	Avula Nagendra	IV th sem	A Nagndra.
3	189Y/A0512	Bandi Naga Ganesh	IV th sem	N Ganesh.
4	189YA0523	Andala Ajay kumar	VI sem	AAK.
5	189Y/A0517	Buchupalli Teja naidu Reddy	VI sem	Teja
6	189Y/A0518	Budigi Jagadeesh	B-Tech IV Sem	Jag.
7	189Y/A0501	A dunukota saji arun	VI th sem	S Telu.
8	189Y/A0519	Busa Sainath Reddy	B-Tech VI sem	B.sainath.
9	189Y/A0526	Chintakunta Bindu	IVI Sem	Bindu
10	189Y/A0502	Atmalapati Nanditha	IV th sem	Nanith
11	189Y/A0537	Eragamreddy Harshitha	B-Tech VI sem	Harshitha
12	189YA0538	Gaaja prasad	VI Sem	Prasad.
13	189Y/A0506	Arava Sivananda Reddy	B-Tech VI th sem	Salvay
14	179Y1A0548	G. Hazitha	VI Sem	G. Hazitha
15	179Y1A0549	G. VINOD KUMAR	B-Tech VI Sem	G. Vk
16	179Y1A0552	G. Rajavardhan Reddy	B-Tech 6th sem	G. Rajavardhan Reddy

17	179Y1A0557	J. Haritha	B.Tech VI Sem	J. Haritha
18	179Y1A0564	K. Sasikala	B.Tech VI Sem	K.S
19	179Y1A0537	D. Yogesh	B.Tech VI Sem	Yogesh.
20	169Y1A0515	C. Bagya Sree	B.Tech 8th sem	Bhagya.
21	179Y1A0566	K. Harika	6th Sem	K. Harika
22	169Y1A0537	G. Krishna panth	BTech 8th sem	Cres
23	169Y1A0559	M. Srinivasulu	8th Sem	Sreenu
24	179Y1A0558	J. SAI KUMAR	6th Sem	J. SAI KUMAR
25	179Y1A0534	D. Yogya vignesh	B.Tech VI Sem	Youge.
26	169Y1A0528	D. Jyothma	BTech VIII Sem	D.J
27	169Y1A0502	A. Sreekanth	VIII Sem	A
28	169Y1A0546	K. Narasimha	8th Sem	Najisna
29	169Y1A0559	K. Naresh.	8th Sem	Nara
30	16Y1A0522	G. Upendra	B.Tech VIII Sem	G.R
31	179Y1A0560	K. Kavitha Reddy	VI Sem	K.K
32	169Y1A0555	M. Suresh	VIII Sem	Suresh.
33	169Y1A0549	B. Venkatesh	8th Sem	B. Venkatesh
34	169Y1A0566	M. Sai yashwanth	8th sem	Sai
35	169Y1A0563	M. Ajay kumar	8th Sem.	Ajay.
36	179Y1A0561	K. Vaarshitha Reddy	6th Sem	K
37	169Y1A0564	M. Dinesh Reddy	VIII Sem	A.
38	169Y1A0556	K. Supraja	8th sem	Supraja.
39	179Y1A0562	K. Venkata Sai Kumar Reddy	6th sem	KS

40	179Y1A0538	D. Anusha	B.Tech VI Sem	D. Anusha
41	189Y1A0539	Gaddee Sai Reetika	VI Sem	Reetika
42	18LY1A0540	Gajulchan Malihanaz	VI Sem	M. Naz.
43	179Y1A0531	Chintala Achila	B.Tech VI Sem	Achila
44	179Y1A0532	D. Mohammad Shoruk	VI Sem	Shuik
45	179Y1A0544	E. Abhishek.	6th Sem	
46	179Y1A0533	Dabbera Sowanya	BTech VI Sem	
47	179Y1A0534	Daddanala Yoguvarth	VI Sem	
48	179Y1A0547	G. Sudeesh chandra Rao	6th Sem	G. Sudeesh
49	179Y1A0519	Bonamsetty Reddy Prasad	B.Tech VI Sem	R. Prasad
50	179Y1A0522	C. Lohith kumar	VI th Sem	Lohith.
51	179Y1A0539	D. Devananda	6th Sem	D. Devananda
52	179Y1A0520	Basigari Bharathi	B.Tech VI Sem	. B.B.
53	179Y1A0523	Chanda Marinadh Reddy	VI th Sem	C. Halvi
54	179Y1A0527	Chenaru Brahmani	BTech VI Sem	C-Br
55	179Y1A0528	Cheppali Shaik mohamed Aslam	BTech VI Sem	Arb
56	179Y1A0543	D. Jyothsna	VI Sem	D. Jyothsn
57	179Y1A0514	Cheppldi Harsha Vardhan Reddy	VI Sem	Harsha.
58	179Y1A0526	C.V.S. Kowshiknath Reddy	BTech VI Sem	Pr.
59	179Y1A0525	Chavva Sravani	B.Tech VI Sem	C. Sravani
60	179Y1A0540	D. Yasaswini	VI Sem	

_____
Coordinator

_____
HoD
Dr. M. Sreenivasulu,
M. E., Ph. D.
Professer & HOD CSE
K.S.R.M. College of Engineering
KADAPA - 516 003

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Date: 11/01/2020

Department of Computer Science & Engineering
Certificate Course on Python for Everybody 20/01/2020 to 06/02/2020
Registered Student List

S.No.	Roll Number	NAME OF THE STUDENT	Year & Branch	Email id
1	189Y1A0501	Adunukota Sai Tarun	B.Tech IV Sem	189Y1A0501@ksrmce.ac.in
2	189Y1A0502	Alavalapati Nanditha (W)	B.Tech IV Sem	189Y1A0502@ksrmce.ac.in
3	189Y1A0503	Andala Ajay Kumar	B.Tech IV Sem	189Y1A0503@ksrmce.ac.in
4	189Y1A0506	Arava Sivananda Reddy	B.Tech IV Sem	189Y1A0506@ksrmce.ac.in
5	189Y1A0507	Avula Nagendra	B.Tech IV Sem	189Y1A0507@ksrmce.ac.in
6	189Y1A0512	Bandi Naga Ganesh	B.Tech IV Sem	189Y1A0512@ksrmce.ac.in
7	189Y1A0517	Buchupalli Tejananda Reddy	B.Tech IV Sem	189Y1A0517@ksrmce.ac.in
8	189Y1A0518	Budigi Jagadeesh	B.Tech IV Sem	189Y1A0518@ksrmce.ac.in
9	189Y1A0519	Busa Sainath Reddy	B.Tech IV Sem	189Y1A0519@ksrmce.ac.in
10	189Y1A0526	Chinthakunta Bindu (W)	B.Tech IV Sem	189Y1A0526@ksrmce.ac.in
11	189Y1A0537	Eragamreddy Harshitha (W)	B.Tech IV Sem	189Y1A0537@ksrmce.ac.in
12	189Y1A0538	Gaaja Prasad	B.Tech IV Sem	189Y1A0538@ksrmce.ac.in
13	189Y1A0539	Gadde Sai Reethika (W)	B.Tech IV Sem	189Y1A0539@ksrmce.ac.in
14	189Y1A0540	Gajakhan Malihanaz (W)	B.Tech IV Sem	189Y1A0540@ksrmce.ac.in
15	179Y1A0519	Bonamsetty Reddyprasad	B.Tech VI Sem	179Y1A0519@ksrmce.ac.in
16	179Y1A0520	Bosigari Bharathi	B.Tech VI Sem	179Y1A0520@ksrmce.ac.in
17	179Y1A0522	C.Lohith Kumar	B.Tech VI Sem	179Y1A0522@ksrmce.ac.in
18	179Y1A0523	Chanda Harinadh Reddy	B.Tech VI Sem	179Y1A0523@ksrmce.ac.in
19	179Y1A0524	Chappidi Harsha Vardhan Reddy	B.Tech VI Sem	179Y1A0524@ksrmce.ac.in
20	179Y1A0525	Chavva Sravani	B.Tech VI Sem	179Y1A0525@ksrmce.ac.in
21	179Y1A0526	C.V.S.Kowshiknath Reddy	B.Tech VI Sem	179Y1A0526@ksrmce.ac.in
22	179Y1A0527	Chenuru Brahmani	B.Tech VI Sem	179Y1A0527@ksrmce.ac.in
23	179Y1A0528	Cheppali Shaik Mahammed Aslam	B.Tech VI Sem	179Y1A0528@ksrmce.ac.in
24	179Y1A0529	Chilakala Mahammadrafi	B.Tech VI Sem	179Y1A0529@ksrmce.ac.in
25	179Y1A0531	Chinthala Akhila	B.Tech VI Sem	179Y1A0531@ksrmce.ac.in
26	179Y1A0532	D Mohammmad Sharuk	B.Tech VI Sem	179Y1A0532@ksrmce.ac.in
27	179Y1A0533	Dabbera Sowmya	B.Tech VI Sem	179Y1A0533@ksrmce.ac.in
28	179Y1A0534	Daddanala Yogya Vignesh	B.Tech VI Sem	179Y1A0534@ksrmce.ac.in
29	179Y1A0537	D. Yogesh	B.Tech VI Sem	179Y1A0537@ksrmce.ac.in

30	179Y1A0538	D Anusha	B.Tech VI Sem	179Y1A0538@ksrmce.ac.in
31	179Y1A0539	Doddi Devananda	B.Tech VI Sem	179Y1A0539@ksrmce.ac.in
32	179Y1A0540	D.Yasaswini	B.Tech VI Sem	179Y1A0540@ksrmce.ac.in
33	179Y1A0543	D. Jyothsna	B.Tech VI Sem	179Y1A0543@ksrmce.ac.in
34	179Y1A0544	E. Abhishek Kumar Sahu	B.Tech VI Sem	179Y1A0544@ksrmce.ac.in
35	179Y1A0547	G. Sudeesh Chandra Rao	B.Tech VI Sem	179Y1A0547@ksrmce.ac.in
36	179Y1A0548	G. Haritha	B.Tech VI Sem	179Y1A0548@ksrmce.ac.in
37	179Y1A0549	G. Vinod Kumar	B.Tech VI Sem	179Y1A0549@ksrmce.ac.in
38	179Y1A0552	G. Rajavardhan Reddy	B.Tech VI Sem	179Y1A0552@ksrmce.ac.in
39	179Y1A0553	G. Sai Sujitha Reddy	B.Tech VI Sem	179Y1A0553@ksrmce.ac.in
40	179Y1A0557	J. Haritha	B.Tech VI Sem	179Y1A0557@ksrmce.ac.in
41	179Y1A0558	J Sai Kumar	B.Tech VI Sem	179Y1A0558@ksrmce.ac.in
42	179Y1A0560	K Kavitha Reddy	B.Tech VI Sem	179Y1A0560@ksrmce.ac.in
43	179Y1A0561	K Varshitha Reddy	B.Tech VI Sem	179Y1A0561@ksrmce.ac.in
44	179Y1A0562	Kambham Venkata Sai Kumar Reddy	B.Tech VI Sem	179Y1A0562@ksrmce.ac.in
45	179Y1A0564	Kancharla Sasikala	B.Tech VI Sem	179Y1A0564@ksrmce.ac.in
46	179Y1A0566	Kanchaveerla Harika	B.Tech VI Sem	179Y1A0566@ksrmce.ac.in
47	169Y1A0502	A. Sreekanth	B.Tech VIII Sem	169Y1A0502@ksrmce.ac.in
48	169Y1A0509	B. Venkatesh	B.Tech VIII Sem	169Y1A0509@ksrmce.ac.in
49	169Y1A0515	C. Bagya Sree	B.Tech VIII Sem	169Y1A0515@ksrmce.ac.in
50	169Y1A0528	D. Jyoshna	B.Tech VIII Sem	169Y1A0528@ksrmce.ac.in
51	169Y1A0532	G. Upendra	B.Tech VIII Sem	169Y1A0532@ksrmce.ac.in
52	169Y1A0534	G. Krishna Kanth	B.Tech VIII Sem	169Y1A0534@ksrmce.ac.in
53	169Y1A0546	K. Narasimha	B.Tech VIII Sem	169Y1A0546@ksrmce.ac.in
54	169Y1A0556	K. Supraja	B.Tech VIII Sem	169Y1A0556@ksrmce.ac.in
55	169Y1A0559	K. Naresh	B.Tech VIII Sem	169Y1A0559@ksrmce.ac.in
56	169Y1A0562	M. Srinivasulu	B.Tech VIII Sem	169Y1A0562@ksrmce.ac.in
57	169Y1A0563	M. Ajay Kumar	B.Tech VIII Sem	169Y1A0563@ksrmce.ac.in
58	169Y1A0564	M. Dinesh Reddy	B.Tech VIII Sem	169Y1A0564@ksrmce.ac.in
59	169Y1A0565	M. Suresh	B.Tech VIII Sem	169Y1A0565@ksrmce.ac.in
60	169Y1A0566	M. Sai Yashwanth	B.Tech VIII Sem	169Y1A0566@ksrmce.ac.in

Coordinator

HoD

Dr. M. Sreenivasulu,
M. E., Ph. D.
Professor & HOD CSE
K.S.R.M. College of Engineering
K A D A P A - 516 003

K.S.R.M. College of Engineering (Autonomous), Kadapa.
Department of CSE
Certificate Course on
Python for Everybody
Syllabus

Overview: Python is **a high-level, interpreted, interactive and object-oriented scripting language**. Python is designed to be highly readable. It uses English keywords frequently where as other languages use punctuation, and it has fewer syntactical constructions than other languages.

Course Objectives: To learn the basics of algorithm problem solving, read and write simple python programs, develop python programs with conditional and loops, define functions and call them, strings, list, dictionaries.

Course Outcomes: At the end of the course participants will be able to
- Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.
- Determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples and sets.

Module 1: Algorithms, building blocks of algorithms, notation, algorithm problem solving, simple strategies for developing algorithms, python interpreter and interactive mode, values and types, statements, assignment, precedence of operators, comments.

Module 2: Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else), Iterations: state, while, for, break, continue, pass, functions: return values, parameters.

Module 3: Strings: string slices, immutability, string functions and methods, string module, lists as arrays. Lists: list operations, list slices, list methods, list loop, mutability, aliasing, cloning lists, list parameters.

Module 4: Dictionaries: operations and methods, advanced list processing, illustrative programs: selection sort, insertion sort, merge sort, histogram.

Module 5: Files and exceptions: text files, reading and writing files, format operator, handling exceptions, modules, packages.

Textbook:

1. Core python programming by Wesley J Chun, Prentice Hall, Second edition.

2. Introduction to Computation and Programming using Python, by John Guttag, PHI Publisher.

3. Learning python, Mark Lutz, O'Reilly publications, 5th edition, 2013.

4. Core python programming by Dr. R. Nageswara Rao, Dreamtech press, second edition, 2018

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Department of Computer Science & Engineering
Certificate Course on Python for Everybody from 20/01/2020 to 06/02/2020
Schedule

S.No	Date	Time	Faculty	Topic
1	20/01/2020	4PM t0 5PM	Dr. N. Ramajaneya Reddy, Dr. M.V. Rathnamma, Sri. Y. Bhaskar Reddy	Inauguration, Introduction to python programming language.
		5PM to 6PM	Dr. M.V. Rathnamma	Algorithms, building blocks of algorithms, notation
2	21/01/2020	4PM t0 5PM	Dr. M.V. Rathnamma	Algorithm problem solving, simple strategies for developing algorithms
		5PM to 6PM	Dr. M.V. Rathnamma	python interpreter and interactive mode
3	22/01/2020	4PM t0 5PM	Sri. Y. Bhaskar Reddy	Values and types, statements, assignment, precedence of operators, comments.
		5PM to 6PM	Sri. Y. Bhaskar Reddy	Practice programs on lab
4	23/01/2020	4PM t0 5PM	Sri. Y. Bhaskar Reddy	Conditionals: Boolean values and operators, conditional (if), alternative (if-else), chained conditional (if-elif-else)
		5PM to 6PM	Sri. Y. Bhaskar Reddy	Practice programs on lab
5	24/01/2020	4PM t0 5PM	Sri. Y. Bhaskar Reddy	Iterations: state, while, for, break, continue, pass, functions: return values, parameters.
		5PM to 6PM	Sri. Y. Bhaskar Reddy	Practice programs on lab
6	25/01/2020	4PM t0 5PM	Dr. M.V. Rathnamma	Strings: string slices, immutability, string functions and methods
		5PM to 6PM	Dr. M.V. Rathnamma	Practice programs on lab
7	27/01/2020	4PM t0 5PM	Dr. M.V. Rathnamma	string module, lists as arrays
		5PM to 6PM	Dr. M.V. Rathnamma	Practice programs on lab
8	28/01/2020	4PM t0 5PM	Dr. M.V. Rathnamma	Lists: list operations, list slices, list methods
		5PM to 6PM	Dr. M.V. Rathnamma	Practice programs on lab
9	29/01/2020	4PM t0 5PM	Sri. Y. Bhaskar Reddy	list loop, mutability, aliasing, cloning lists, list parameters.
		5PM to 6PM	Sri. Y. Bhaskar Reddy	Practice programs on lab
10	30/01/2020	4PM t0 5PM	Sri. Y. Bhaskar Reddy	Dictionaries: operations and methods,

		5PM to 6PM	Sri. Y. Bhaskar Reddy	Practice programs on lab
11	31/01/2020	4PM t0 5PM	Sri. Y. Bhaskar Reddy	Advanced list processing
		5PM to 6PM	Sri. Y. Bhaskar Reddy	Practice programs on lab
12	01/02/2020	4PM t0 5PM	Dr. M.V. Rathnamma	Selection sort, insertion sort
		5PM to 6PM	Dr. M.V. Rathnamma	Practice programs on lab
13	03/02/2020	4PM t0 5PM	Dr. M.V. Rathnamma	Merge sort, histogram
		5PM to 6PM	Dr. M.V. Rathnamma	Practice programs on lab
14	04/02/2020	4PM t0 5PM	Sri. Y. Bhaskar Reddy	Files and exceptions: text files, reading and writing files, format operator
		5PM to 6PM	Sri. Y. Bhaskar Reddy	Practice programs on lab
15	05/02/2020	4PM t0 5PM	Sri. Y. Bhaskar Reddy	Handling exceptions, modules, packages
		5PM to 6PM	Sri. Y. Bhaskar Reddy	Practice programs on lab
16	06/02/2020	4PM t0 6PM	Dr. N. Ramajaneya Reddy, Dr. M.V. Rathnamma, Sri. Y. Bhaskar Reddy	Exam, Certificate distribution

Coordinator

HoD

Dr. M. Sreenivasulu,
M. E., Ph. D.
Professer & HOD CSE
K.S.R.M. College of Engineering
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Department of Computer Science & Engineering

Certificate Course on Python for Everybody

Attendance Sheet

S.No	Roll Num	Name of the Student	20/01/2020	21/01/2020	22/01/2020	23/01/2020	24/01/2020	25/01/2020	27/01/2020	28/01/2020	29/01/2020	30/01/2020	31/01/2020	01/02/2020	03/02/2020	04/02/2020	05/02/2020	06/02/2020
1	189Y1A0501	Adunukota Sai Tarun	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P
2	189Y1A0502	Alavalapati Nanditha (W)	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P
3	189Y1A0503	Andala Ajay Kumar	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P
4	189Y1A0506	Arava Sivananda Reddy	P	P	P	P	P	P	A	P	P	P	P	A	P	P	P	P
5	189Y1A0507	Avula Nagendra	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
6	189Y1A0512	Bandi Naga Ganesh	P	P	A	P	P	P	P	P	P	P	P	P	P	A	P	P
7	189Y1A0517	Buchupalli Tejananda Reddy	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P
8	189Y1A0518	Budigi Jagadeesh	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
9	189Y1A0519	Busa Sainath Reddy	P	P	P	P	P	P	P	A	P	P	P	A	P	P	P	P
10	189Y1A0526	Chinthakunta Bindu (W)	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P
11	189Y1A0537	Eragamreddy Harshitha (W)	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P
12	189Y1A0538	Gaaja Prasad	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
13	189Y1A0539	Gadde Sai Reethika (W)	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P
14	189Y1A0540	Gajakhan Malihanaz (W)	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P

S.No	Roll No	Name																
15	179Y1A0519	Bonamsetty Reddyprasad	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
16	179Y1A0520	Bosigari Bharathi	P	P	A	P	P	P	P	P	P	P	P	P	P	A	P	P
17	179Y1A0522	C.Lohith Kumar	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P
18	179Y1A0523	Chanda Harinadh Reddy	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P
19	179Y1A0524	Chappidi Harsha Vardhan Reddy	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P
20	179Y1A0525	Chavva Sravani	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
21	179Y1A0526	C.V.S.Kowshiknath Reddy	P	P	P	P	A	P	P	P	P	P	P	A	P	P	P	
22	179Y1A0527	Chenuru Brahmani	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P
23	179Y1A0528	Cheppali Shaik Mahammed Aslam	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
24	179Y1A0529	Chilakala Mahammadrafi	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P
25	179Y1A0531	Chinthala Akhila	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
26	179Y1A0532	D Mohammmad Sharuk	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P
27	179Y1A0533	Dabbera Sowmya	P	P	P	A	P	P	P	P	P	P	P	P	P	P	A	P
28	179Y1A0534	Daddanala Yogya Vignesh	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P
29	179Y1A0537	D. Yogesh	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P
30	179Y1A0538	D Anusha	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P
31	179Y1A0539	Doddi Devananda	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
32	179Y1A0540	D.Yasaswini	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
33	179Y1A0543	D. Jyothsna	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P
34	179Y1A0544	E. Abhishek Kumar Sahu	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
35	179Y1A0547	G. Sudeesh Chandra Rao	P	P	P	P	P	P	P	P	P	P	A	P	P	A	P	P
36	179Y1A0548	G. Haritha	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
37	179Y1A0549	G. Vinod Kumar	P	P	P	P	P	P	P	P	P	P	P	P	P	P	A	P
38	179Y1A0552	G. Rajavardhan Reddy	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P	P
39	179Y1A0553	G. Sai Sujitha Reddy	A	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P
40	179Y1A0557	J. Haritha	P	P	P	P	P	P	P	P	P	A	P	P	P	P	P	P
41	179Y1A0558	J Sai Kumar	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P
42	179Y1A0560	K Kavitha Reddy	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P
43	179Y1A0561	K Varshitha Reddy	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P
44	179Y1A0562	Kambham Venkata Sai Kumar Reddy	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P	P
45	179Y1A0564	Kancharla Sasikala	P	P	P	P	P	P	A	P	P	P	P	P	A	P	P	P
46	179Y1A0566	Kanchaveerla Harika	P	P	P	P	P	P	P	P	P	P	A	P	P	P	A	P

47	169Y1A0502	A. Sreekanth	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P
48	169Y1A0509	B. Venkatesh	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
49	169Y1A0515	C. Bagya Sree	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
50	169Y1A0528	D. Jyoshna	P	P	P	P	P	P	P	A	P	P	P	P	P	P	P	P
51	169Y1A0532	G. Upendra	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
52	169Y1A0534	G. Krishna Kanth	P	P	P	P	P	P	P	P	A	P	P	P	P	A	P	P
53	169Y1A0546	K. Narasimha	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P	P
54	169Y1A0556	K. Supraja	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
55	169Y1A0559	K. Naresh	P	P	P	A	P	P	P	P	P	P	P	P	P	P	P	P
56	169Y1A0562	M. Srinivasulu	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
57	169Y1A0563	M. Ajay Kumar	P	P	P	P	A	P	A	P	P	P	P	P	P	P	P	P
58	169Y1A0564	M. Dinesh Reddy	P	P	P	P	P	P	P	P	P	P	P	P	A	P	P	P
59	169Y1A0565	M. Suresh	P	P	P	P	P	A	P	P	P	P	P	A	P	P	P	P
60	169Y1A0566	M. Sai Yashwanth	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P

N.

Coordinator

HoD

Dr. M. Sreenivasulu,
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Professor & HOD CSE
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K.S.R.M. COLLEGE OF ENGINEERING

(UGC - Autonomous)

Kadapa, Andhra Pradesh, India– 516 003

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Course on

Python for everybody
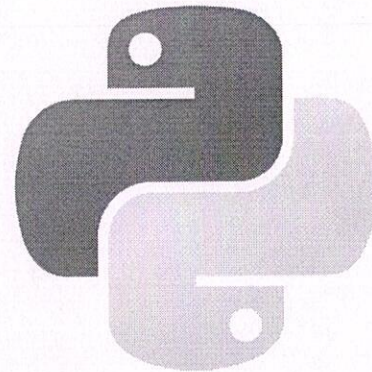
from 20-01-2020
to 06-02-2020
Venue : BDA Lab(PG-207)

Coordinator : Dr.N. Ramajaneya reddy

Resource Person: **Dr. M. V. Rathamma**
Mr. Y. Baskhar Reddy

K.S.R.M. COLLEGE OF ENGINEERING
(AUTONOMOUS)
Pulivendala Road, Kadapa-516 005
Andhra Pradesh, India
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An ISO 14001:2004 & 9001: 2015 Certified Institution

ACTIVITY REPORT

Certification Course

On

Python for Everybody
20/01/2020 to 06/02/2020

Target Group	:	**Students**
Details of Participants	:	**60 Students**
Coordinator	:	**Dr. N. Ramanjaneya Reddy** **Associate Prof, Dept. of CSE,KSRMCE**
Organizing Department	:	**Computer Science & Engineering**
Venue	:	**Programming in C Lab(MB 110)**

Description: Certification course on "Python for Everybody" was organized by Dept. of CSE from 20/01/2020 to 06/02/2020 (4.00PM to 6.00PM). Dr. N. Ramanjaneya Reddy acted as Course Coordinator and Dr. M.V. Rathnamma and MR. Y. Bhaskar Reddy acted as resource persons. The course is designed to provide knowledge of Python Programming and to enhance the programming skills of the students by giving practical assignments to be done in labs. Thirty Seven hours course was successfully completed and participation certificates were provided to the participants.

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Course on

Python for everybody
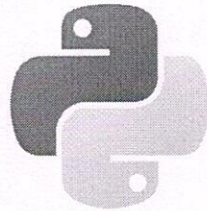
from 20-01-2020
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Resource Person: Dr. M. V. Rathamma

Mr. Y. Baskhar Reddy

K.S.R.M Administration Building, KSRM Hostel Rd,Andhra Pradesh 516003, India
Latitude **14.477843°**   Longitude **78.766100°**
LOCAL 16:20:12   GMT 10:40:12   WEDNUSDAY 22.01.2020   ALTITUDE 30 METER

K.S.R.M Administration Building, KSRM Hostel Rd Andhra Pradesh 516003, India
Latitude **14.477843°**   Longitude **78.766100°**
LOCAL 16:40:12   GMT 11:00:12 FRIDAY 31.01.2020   ALTITUDE 30 METER

Coordinator

HoD

Dr. M. Sreenivasulu,
M. E , Ph. D.
Professer & HOD CSE
K.S.R.M. College of Engineering
K A D A P A - 516 003

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

CERTIFICATE OF PARTICIPATION

This is to certify that Mr/Miss. _A. Sai Tarun_ bearing Roll Number. _189Y1A0501_ participated in a certification course on **"Python for everybody"** organized by department of Computer Science and Engineering from 20-01-2020 to 06-02-2020.

COORDINATOR   HOD   PRINCIPAL

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

CERTIFICATE OF PARTICIPATION

This is to certify that Mr/Miss. _A. Nagendra_ bearing Roll Number. _189Y1A0507_ participated in a certification course on **"Python for everybody"** organized by department of Computer Science and Engineering from 20-01-2020 to 06-02-2020.

COORDINATOR	HOD	PRINCIPAL

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

CERTIFICATE OF PARTICIPATION

This is to certify that Mr/Miss. _M.Sai Yashwanth_ bearing Roll Number. _169Y1A0566_ participated in a certification course on **"Python for everybody"** organized by department of Computer Science and Engineering from 20-01-2020 to 06-02-2020.

COORDINATOR   HOD   PRINCIPAL

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FEEDBACK FORM

Certificate Course on "Python for Everybody", from 20/01/2020 to 06/02/2020

Organized

by

Department of Computer Science & Engineering

NAME:

Roll No:

S.No	Feedback Item	Excellent	Very Good	Good	Average	Below Average
1	Organization of certificate course and session planning by instructor.					
2	Clarity in content delivery.					
3	Content is relevant and useful.					
4	Adequate opportunity to interact with trainer.					
5	Judicious mix of concepts. Principles and practices.					
6	Assignments and tasks are interesting and challenging.					
7	Overall rating					

Any suggestions for improvement.

Signature

1

FEEDBACK FORM

Certificate Course on "Python for Everybody", from 20/01/2020 to 06/02/2020

Organized

by

Department of Computer Science & Engineering

NAME: M. Sai Yashwanth

Roll No: 16941A0566

S.No	Feedback Item	Excellent	Very Good	Good	Average	Below Average
1	Organization of certificate course and session planning by instructor.	✓				
2	Clarity in content delivery.		✓			
3	Content is relevant and useful.	✓				
4	Adequate opportunity to interact with trainer.	✓				
5	Judicious mix of concepts. Principles and practices.		✓			
6	Assignments and tasks are interesting and challenging.	✓				
7	Overall rating		✓			

Any suggestions for improvement.

Signature

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FEEDBACK FORM

Certificate Course on "Python for Everybody", from 20/01/2020 to 06/02/2020
Organized
by
Department of Computer Science & Engineering

NAME: Chavva srevani

Roll No: 179Y1A0525

S.No	Feedback Item	Excellent	Very Good	Good	Average	Below Average
1	Organization of certificate course and session planning by instructor.		✓			
2	Clarity in content delivery.	✓				
3	Content is relevant and useful.	✓				
4	Adequate opportunity to interact with trainer.	✓				
5	Judicious mix of concepts. Principles and practices.	✓				
6	Assignments and tasks are interesting and challenging.	✓				
7	Overall rating		✓			

Any suggestions for improvement.

C-srevani
Signature

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FEEDBACK FORM

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by

Department of Computer Science & Engineering

NAME: D. Anusha

Roll No: 17941A0538

S.No	Feedback Item	Excellent	Very Good	Good	Average	Below Average
1	Organization of certificate course and session planning by instructor.	✓				
2	Clarity in content delivery.	✓				
3	Content is relevant and useful.	✓	✓			
4	Adequate opportunity to interact with trainer.		✓			
5	Judicious mix of concepts. Principles and practices.	✓				
6	Assignments and tasks are interesting and challenging.	✓	✓			
7	Overall rating		✓			

Any suggestions for improvement.

D. Anusha

Signature

1

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FEEDBACK FORM

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Department of Computer Science & Engineering

NAME: D. Devananda

Roll No: 179Y1A0539

S.No	Feedback Item	Excellent	Very Good	Good	Average	Below Average
1	Organization of certificate course and session planning by instructor.	✓				
2	Clarity in content delivery.	✓	✓			
3	Content is relevant and useful.	✓				
4	Adequate opportunity to interact with trainer.	✓				
5	Judicious mix of concepts. Principles and practices.	✓				
6	Assignments and tasks are interesting and challenging.		✓			
7	Overall rating	✓				

Any suggestions for improvement.

D. Devananda
Signature

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FEEDBACK FORM

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by

Department of Computer Science & Engineering

NAME: Gaaga Prasad

Roll No: 1894/A0538

S.No	Feedback Item	Excellent	Very Good	Good	Average	Below Average
1	Organization of certificate course and session planning by instructor.	✓				
2	Clarity in content delivery.		✓			
3	Content is relevant and useful.	✓				
4	Adequate opportunity to interact with trainer.	✓				
5	Judicious mix of concepts. Principles and practices.	✓				
6	Assignments and tasks are interesting and challenging.		✓			
7	Overall rating	✓				

Any suggestions for improvement.

Signature

1

Polynomial Regression

- Polynomial regression, like linear regression, uses the relationship between the variables x and y to find the best way to draw a line through the data points.
- Import numpy and matplotlib then draw the line of Polynomial Regression:

```
import numpy
import matplotlib.pyplot as plt

x = [1,2,3,5,6,7,8,9,10,12,13,14,15,16,18,19,21,22]
y = [100,90,80,60,60,55,60,65,70,70,75,76,78,79,90,99,99,100]

mymodel = numpy.poly1d(numpy.polyfit(x, y, 3))

myline = numpy.linspace(1, 22, 100)

plt.scatter(x, y)
plt.plot(myline, mymodel(myline))
plt.show()
```

Multiple regression

- Multiple regression is like linear regression, but with more than one independent value, meaning that we try to predict a value based on **two or more** variables.

Car	Model	Volume	Weight	CO2
Toyota	Aygo	1000	790	99
Mitsubishi	Space Star	1200	1160	95
Skoda	Citigo	1000	929	95
Fiat	500	900	865	90
Mini	Cooper	1500	1140	105
VW	Up!	1000	929	105
Skoda	Fabia	1400	1109	90
Mercedes	A-Class	1500	1365	92
Ford	Fiesta	1500	1112	98
Audi	A1	1600	1150	99

```
import pandas
from sklearn import linear_model

df = pandas.read_csv("cars.csv")

X = df[['Weight', 'Volume']]
y = df['CO2']

regr = linear_model.LinearRegression()
regr.fit(X, y)

#predict the CO2 emission of a car where the weight is 2300kg, and the volume is 1300cm3:
predictedCO2 = regr.predict([[2300, 1300]])

print(predictedCO2)
```

What is Data Analytics?

- Data analytics is the process of exploring and analyzing large datasets to make predictions and boost data-driven decision making. Data analytics allows us to collect, clean, and transform data to derive meaningful insights. It helps to answer questions, test hypotheses, or disprove theories.

Applications of Data Analytics

- Data analytics is used in the banking and e-commerce industries to detect fraudulent transactions.
- The healthcare sector uses data analytics to improve patient health by detecting diseases before they happen. It is commonly used for cancer detection.
- Data analytics finds its usage in inventory management to keep track of different items.
- Logistics companies use data analytics to ensure faster delivery of products by optimizing vehicle routes.
- Marketing professionals use analytics to reach out to the right customers and perform targeted marketing to increase ROI.
- Data analytics can be used for city planning, to build smart cities.

Types of Data Analytics

1. **Descriptive Analytics**
2. **Predictive Analytics**
3. **Prescriptive Analytics**

Descriptive Analytics

- It tells you what has happened. It can be done using an exploratory data analysis.
- Example: Studying the total units of chairs sold and the profit that was made in the past.

Predictive Analytics

- It tells you what will happen. It can be achieved by building predictive models.
- Example: Predicting the total units of chairs that would sell and the profit we can expect in the future.

Prescriptive Analytics

- It tells you how to make something happen. It can be done by deriving key insights and hidden patterns from the data.
- Example: Finding ways to improve sales and profit of chairs.

Data Analytics Process Steps

- **Data Collection:** The first step in data analytics is to collect or gather relevant data from multiple sources. Data can come from different databases, web servers, log files, social media, excel and CSV files, etc.
- **Data Preparation:** The next step in the process is to prepare the data. It involves cleaning the data to remove unwanted and redundant values, converting it into the right format, and making it ready for analysis. It also requires data wrangling.

- **Data Exploration:** After the data is ready, data exploration is done using various data visualization techniques to find unseen trends from the data.
- **Data Modeling:** The next step is to build your predictive models using machine learning algorithms to make future predictions.
- **Result interpretation:** The final step in any data analytics process is to derive meaningful results and check if the output is in line with your expected results.

Why Data Analytics Using Python?

- There are many programming languages available, but Python is popularly used by statisticians, engineers, and scientists to perform data analytics.

Reasons for using Python

- Python is easy to learn and understand and has a simple syntax.
- The programming language is scalable and flexible.
- It has a vast collection of libraries for numerical computation and data manipulation.
- Python provides libraries for graphics and data visualization to build plots.
- It has broad community support to help solve many kinds of queries.

When using [ ], the result is a Pandas **DataFrame**.

```
import pandas as pd

data = {
  "sid": [420, 380, 390],
  "marks": [70, 84, 65]
}

df = pd.DataFrame(data)

print(df.loc[[0]])

   sid  marks
0  420     70
```

Named Indexes

With the index argument, you can name your own indexes.

```
import pandas as pd

data = {
  "sid": [420, 380, 390],
  "marks": [70, 84, 65]
}

df = pd.DataFrame(data,index=["Sub1","Sub2","Sub3"])

print(df)

      sid  marks
Sub1  420     70
Sub2  380     84
Sub3  390     65
```

Load Files Into a DataFrame

- If your data sets are stored in a file, Pandas can load them into a DataFrame.
- Create a CSV file using MS Excel

```
import pandas as pd

df = pd.read_csv('data.csv')

print(df)
```

max_rows

- The number of rows returned is defined in Pandas option settings.
- We can check your system's maximum rows with the pd.options.display.max_rows statement.
- The default number is 60 rows, which means that if the DataFrame contains more than 60 rows, the print(df) statement will return only the headers and the first and last 5 rows.

You can change the maximum rows number with the same statement.

```
import pandas as pd

pd.options.display.max_rows = 9999
df = pd.read_csv('data.csv')

print(pd)
```

Read JSON

- Big data sets are often stored, or extracted as JSON.
- JSON is plain text, but has the format of an object.

```
import pandas as pd

df = pd.read_json('data.json')

print(pd)
```

Viewing the Data

- One of the most used method for getting a quick overview of the DataFrame, is the head() method.
- The head() method returns the headers and a specified number of rows, starting from the top.

```
import pandas as pd

df = pd.read_csv('data.csv')

print(df.head(5))

   Sl no  Student Id   Name  Marks
0      1         501  Vinay     78
1      2         502  Kiran     79
2      3         503   Ravi     80
3      4         504   Siva     81
4      5         505   Mani     82
```

- There is also a tail() method for viewing the *last* rows of the DataFrame.
- The tail() method returns the headers and a specified number of rows, starting from the bottom.

```
import pandas as pd

df = pd.read_csv('data.csv')

print(df.tail())

   Sl no  Student Id    Name  Marks
5      6         506  Harish     83
6      7         507   Satya     84
7      8         508   Karna     85
8      9         509  Dinesh     86
9     10         510   Kumar     87
```

Pandas - Cleaning Data

Data cleaning means fixing bad data in your data set.

Bad data could be:
1. Empty cells
2. Data in wrong format
3. Wrong data
4. Duplicates

Pandas - Cleaning Empty Cells

- Empty cells can potentially give you a wrong result when you analyze data.
- One way to deal with empty cells is to remove rows that contain empty cells.
- since data sets can be very big, and removing a few rows will not have a big impact on the result.

Remove Empty rows

- By default, the dropna() method returns a *new* DataFrame, and will not change the original.

```
import pandas as pd

df = pd.read_csv('data.csv')
new_df = df.dropna()

print(new_df)
```

- If you want to change the original DataFrame, use the inplace = True argument:

```
import pandas as pd

df = pd.read_csv('data.csv')
df.dropna(inplace = True)

print(new_df)
```

Replace Empty Values

- Another way of dealing with empty cells is to insert a *new* value instead.
- This way you do not have to delete entire rows just because of some empty cells.
- The fillna() method allows us to replace empty cells with a value:

```
import pandas as pd

df = pd.read_csv('data.csv')
df.fillna(135, inplace = True)

print(new_df)
```

Replace Only For Specified Columns

- To only replace empty values for one column, specify the *column name* for the DataFrame:

```
import pandas as pd

df = pd.read_csv('data.csv')
df["Marks"].fillna(35, inplace=True)

print(df)
```

Using Mean, Median, or Mode

- A common way to replace empty cells, is to calculate the mean, median or mode value of the column.
- Pandas uses the mean() median() and mode() methods to calculate the respective values for a specified column:
- **Mean** = the average value (the sum of all values divided by number of values).
- **Median** = the value in the middle, after you have sorted all values ascending.
- **Mode** = the value that appears most frequently.

```
import pandas as pd

df = pd.read_csv('data.csv')
x = df["Marks"].mean()
y = df["Marks"].median()
z = df["Marks"].mode()
df["Marks"].fillna(x, inplace=True)

print(df)
```

Programs on Dictionary

Python program to check whether the key already exists in dictionary

```
d = {'a': 1, 'b': 2, 'c':3, 'd':4}
if 'a' in d:
    print("Key is present")
else:
    print("Key is not present")
```

```
Key is present
```

---

2. Python program to iterate over dictionaries

```
d = {'a': 1, 'b': 2, 'c':3, 'd':4}
for dict_key, dict_value in d.items():
    print(dict_key,':',dict_value)
```

```
a : 1
b : 2
c : 3
d : 4
```

---

3. Python program to remove a key from dictionary

```
d = {'a': 1, 'b': 2, 'c':3, 'd':4}
print(d)
if 'a' in d:
    del d['a']
print(d)
```

```
{'a': 1, 'b': 2, 'c': 3, 'd': 4}
{'b': 2, 'c': 3, 'd': 4}
```

---

4. Python program to remove duplicates

```
d = {'a': 1, 'b': 2, 'c':3, 'd':4, 'e':1, 'f':2 }
print(d)
result = {}
for key,value in d.items():
    if value not in result.values():
        result[key] = value
print(result)
```

```
{'a': 1, 'b': 2, 'c': 3, 'd': 4, 'e': 1, 'f': 2}
{'a': 1, 'b': 2, 'c': 3, 'd': 4}
```

---

5. Python program to map two lists into a dictionary

```
keys = ["sid","sname","dept"]
vals = ["520","Kumar","AI ML"]
student = dict(zip(keys,vals))
print(student)
```

```
{'sid': '520', 'sname': 'Kumar', 'dept': 'AI ML'}
```

Python Functions

- A function is a sub program or block of statements with a name called function name.
- A function gets executed only when it is called from somewhere in the program.

```
def funct():
    print("Hello from a function")

funct()
```

```
Hello from a function
```

Function Parameter and Arguments

- A parameter is the variables listed inside the parentheses in the function definition.
- An argument is the values that are sent to the function when it is called.

```
def funct(a,b):
    print(a+b)

funct(2,3)
```

5

Arbitrary Arguments, *args

- If you do not know how many arguments that will be passed into your function, add a * before the parameter name in the function definition.

```
def funct(*params):
    print(params[0]+params[1])

funct(10,15)
```

25

Passing a List as an Argument

- You can send any data types of argument to a function (string, number, list, dictionary etc.), and it will be treated as the same data type inside the function.

```
def funct(lst):
    for x in lst:
        print(x)

depts = ["CSE","ECE","EEE"]
funct(depts)
```

```
CSE
ECE
EEE
```

Return Values

- A Function can also return a value as and when required. Use return keyword to return value from function.

```
def funct(val):
    res = 5 * val
    return res

funct(10)
```

50

Programs on Functions

1. Write a program using functions to perform arithmetic operations based on user choice
2. Write a function to sum all numbers in a list
3. Write a function to calculate factorial of given number
4. Write function to find given string is palindrome or not
5. Write a function to find given number is prime or not

Python Classes and Objects

- Python is an object oriented programming language.
- Almost everything in Python is an object, with its properties and methods.
- A Class is like an object constructor, or a "blueprint" for creating objects.

Create a Class

- Use class keyword to create a class

```
class MyClass:
    x = 5
```

Create Object

- An Object is a variable of class. Use class name to create an object

```
class MyClass:
    x = 5
obj = MyClass()
```

Access Members of a class

- Use . Operator to access members of a class

```
class MyClass:
    x = 5
obj = MyClass()
print(obj.x)
```

5

The __init__() Function

- The __init__() function is called automatically every time the class is being used to create a new object.
- Use this function to initialize values to variables

```
class MyClass:
    def __init__(self, x, y):
        print(x+y)
obj = MyClass(1,2)
```

3

Programs on Tuple

1. Python program to create a tuple with different data types

```
tup=("IBM",True,5.2,59)
print(tup)
```

```
('IBM', True, 5.2, 59)
```

2. Python program to assign tuple values to multiple variables

```
tup=("IBM",True,5.2,59)
a,b,c,d = tup
print(a)
print(b)
print(c)
print(d)
```

```
IBM
True
5.2
59
```

3. Add an item in a tuple (without list convertion)

```
# tuples are immutables, so you cannot add items.
# we achieve this using merge function, hence creates new tuple
tup = (1,2,3,4)
tup = tup + (5,)
print(tup)
```

```
(1, 2, 3, 4, 5)
```

4. Python pogram to convert tuple to string

```
tup = ('I','B','M')
str = ''.join(tup)
print(str)
```

```
IBM
```

5. Python program to find repeated item in tuple

```
tup = (2,5,8,5,3,4,9,5,8,6,2,5)
print(tup.count(5))
```

```
4
```

6. Python program to check whether an item exists in tuple

```
tup = ('I','B','M')
print('I' in tup)
```

```
True
```

7. Program to convert list to tuple

8. Python program to remove an item from tuple

```
tup = ('I','K','B','M')
tup = tup[:1] + tup[2:]
print(tup)
```

```
('I', 'B', 'M')
```

9. Program to reverse a tuple

```
tup = ('I','B','M')
tup = reversed(tup)
print(tuple(tup))
```

```
('M', 'B', 'I')
```

10. Program to add list and tuple to a list

```
tup = ('I','B','M')
lst = list(tup)
lst.append(tup)
lst.append(list(tup))
print(lst)
```

```
['I', 'B', 'M', ('I', 'B', 'M'), ['I', 'B', 'M']]
```

Python Sets

- A set is a collection which is *unordered*, *unchangeable*, and *unindexed*.
- Set *items* are unchangeable, but you can remove items and add new items.

```
myset = {"CSE", "ECE", "EEE"}
print(myset)

# Note: the set list is unordered, meaning: the items will appear in a random order.
```

- Set items in a set do not have a defined order.
- Set items can appear in a different order every time you use them, and cannot be referred to by index or key.
- Sets cannot have two items with the same value.

```
thisset = {"CSE", "ECE", "EEE", "ECE"}
print(thisset)
```

```
{'CSE', 'ECE', 'EEE'}
```

Length of a Set

- Use len() function to get length of a set

```
thisset = {"CSE", "ECE", "EEE", "ECE"}
print(len(thisset))
```

```
3
```

set() Constructor

- It is also possible to use the set() constructor to make a set.

```
thisset = set(("CSE", "ECE", "EEE", "ECE"))
print(thisset)
```

```
{'CSE', 'ECE', 'EEE'}
```

Access set items

- We cannot access items in a set by referring to an index or a key.
- Use for loop to access items in a set

```
thisset = set(("CSE", "ECE", "EEE", "ECE"))
for x in thisset:
    print(x)
```

```
CSE
ECE
EEE
```

Add new items

- Once a set is created, you cannot change its items, but you can add new items.

```
thisset = set(("CSE", "ECE", "EEE", "ECE"))
thisset.add("Mech")
print(thisset)
```

```
{'CSE', 'ECE', 'EEE', 'Mech'}
```

5. Write a Python program to check whether an alphabet is a vowel or consonant.

6.

Python Collections (Arrays)

There are four collection data types in the Python programming language:

- **List:** is a collection which is ordered and changeable. Allows duplicate members.
- **Tuple:** is a collection which is ordered and unchangeable. Allows duplicate members.
- **Set:** is a collection which is unordered, unchangeable. No duplicate members.
- **Dictionary:** is a collection which is ordered and changeable. No duplicate members.

Python Lists

- Lists are used to store multiple items in a single variable. List items are ordered, changeable, and allow duplicate values.
- List items are indexed, the first item has index [0], the second item has index [1] etc.

```
thislist = ["apple", "banana", "cherry"]
print(thislist)
```

List Length

- To determine how many items a list has, use the len() function:

Ex:

len(thislist)

```
thislist = ["apple", "banana", "cherry"]
print(len(thislist))
```

The list() Constructor

- It is also possible to use the list() constructor when creating a new list.

Ex:

```
thislist = list(("apple", "banana", "cherry"))

# note the double round-brackets
print(thislist)
```

Access List Items

```
thislist = ["apple", "banana", "cherry"]

print(thislist[1])
print(thislist[2:3])
```

Check if Item Exists

- To determine if a specified item is present in a list use the "in" keyword:

- ```
  thislist = ["apple", "banana", "cherry"]
  if "apple" in thislist:
    print("Yes, 'apple' is in the fruits list")
  ```

Change List Items

- ```
  thislist = ["apple", "banana", "cherry"]
  thislist[1] = "blackcurrant"
  print(thislist)
  ```

- ```
  thislist = ["apple", "banana", "cherry", "orange", "kiwi", "mango"]
  thislist[1:3] = ["blackcurrant", "watermelon"]
  print(thislist)
  ```

Append List Items

- To add an item to the end of the list, use the append() method:

Ex:

```
thislist = ["apple", "banana", "cherry"]
thislist.append("orange")
print(thislist)
```

Insert List Items

- To insert a list item at a specified index, use the insert() method.
- The insert() method inserts an item at the specified index:

Ex:

```
thislist = ["apple", "banana", "cherry"]
thislist.insert(1, "orange")
print(thislist)
```

Extend List

- To append elements from *another list* to the current list, use the extend() method.

Ex:

```
thislist = ["apple", "banana", "cherry"]
tropical = ["mango","pineapple","papaya"]
thislist.extend(tropical)
print(thislist)
```

Remove List Items

- The remove() method removes the specified item.

Ex:

```
thislist = ["apple", "banana", "cherry"]
thislist.remove("banana")
print(thislist)
```

Remove Specified Index

- The pop() method removes the specified index.

Ex:

```
thislist = ["apple", "banana", "cherry"]
thislist.pop(1)
print(thislist)
```

Sort Lists

- List objects have a sort() method that will sort the list alphanumerically, ascending, by default:

Ex:

```
thislist = ["orange", "mango", "kiwi", "pineapple", "banana"]
thislist.sort()
print(thislist)
```

Sort Descending - List

- To sort descending, use the keyword argument reverse = True:

Ex:

```
thislist = ["orange", "mango", "kiwi", "pineapple", "banana"]
thislist.sort(reverse = True)
print(thislist)
```

Reverse Order - List

- The reverse() method reverses the current sorting order of the elements.

Ex:

```
thislist = ["banana", "Orange", "Kiwi", "cherry"]
thislist.reverse()
print(thislist)
```

Python Data Types

- Python has the following data types built-in by default, in these categories:
- Text Type: str
- Numeric Types: int, float, complex
- Sequence Types: list, tuple, range
- Mapping Type: dict
- Set Types: set, frozenset
- Boolean Type: bool
- Binary Types: bytes, bytearray, memoryview

Python Strings

- Strings in python are surrounded by either single quotation marks, or double quotation marks.
- 'hello' is the same as "hello".
- Ex:

      print("Hello")
      print('Hello')

Multiline Strings

- You can assign a multiline string to a variable by using three quotes:
  Ex:

  a = """I am a Beginner in PYTHON,
      Machine Learning,
      Data Science."""

  print(a)

Sub String

- b = "Hello, World!"
  print(b[2:5])   O/P: llo (begin with index – length)

- **Slice From the Start**

  b = "Hello, World!"
  print(b[:5])   O/P: Hello

- **Slice To the End**

  b = "Hello, World!"
  print(b[2:])   O/P: llo, World!

Upper Case

  a = "Hello, World!"
  print(a.upper())

Lower Case

  a = "Hello, World!"
  print(a.lower())

- **Remove Whitespace**

  a = " Hello, World! "
  print(a.strip()) # returns "Hello, World!"

- **Replace String (All Chars)**

- a = "Hello, World!"
  print(a.replace("H", "J"))

- **String Concatenation**

  a = "Hello"
  b = "World"
  c = a + b
  print(c)

Numeric Data Types:

```
x = 3+5j
y = 5.2
z = 10

print(type(x))
print(type(y))
print(type(z))
```

Output:

```
<class 'complex'>
<class 'float'>
<class 'int'>
```

Python Operators

- Arithmetic operators
- Assignment operators
- Comparison operators
- Logical operators
- Identity operators
- Membership operators
- Bitwise operators

Python Arithmetic Operators

Operator	Name	Example
+	Addition	x + y
-	Subtraction	x - y
*	Multiplication	x * y
/	Division	x / y
%	Modulus	x % y
**	Exponentiation	x ** y
//	Floor division	x // y

Examples:

```
In [2]: 3**2
Out[2]: 9

In [3]: 3//2
Out[3]: 1

In [4]: 3/2
Out[4]: 1.5

In [5]: 10%3
Out[5]: 1
```

Exercise

1. Read 4 Subjects marks and display total and average
2. Read X value from user and display X^3

Python Assignment Operators

Operator	Example	Same As
=	x = 5	x = 5
+=	x += 3	x = x + 3
-=	x -= 3	x = x - 3
*=	x *= 3	x = x * 3
/=	x /= 3	x = x / 3
%=	x %= 3	x = x % 3
//=	x //= 3	x = x // 3
**=	x **= 3	x = x ** 3

Python Comparison Operators

Operator	Name	Example
==	Equal	x == y
!=	Not equal	x != y
>	Greater than	x > y
<	Less than	x < y
>=	Greater than or equal to	x >= y
<=	Less than or equal to	x <= y

Python Logical Operators

Operator	Description	Example
and	Returns True if both statements are true	x < 5 and x < 10
or	Returns True if one of the statements is true	x < 5 or x < 4
not	Reverse the result, returns False if the result is true	not(x < 5 and x < 10)

Python Identity Operators

Operator	Description	Example
is	Returns True if both variables are the same object	x is y
is not	Returns True if both variables are not the same object	x is not y