

27th Jan 2020

To

The Principal,
Sri Y N College,
Narsapur.

Respected sir,

Sub: **Guest Speaker Invitation**

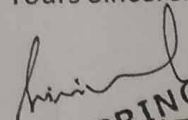
The department of Computer Science wishes to conduct a Two-Day workshop on "Machine Learning" for III BSc II Semester students of our college from 03-02-2020 to 04-02-2020.

Kindly depute one of your Computer Science faculty members as a resource person to deliver an expert lecture on "Machine Learning". We believe that your contribution to this field is unparalleled and a workshop on this topic will be of great benefit.

Thanking you.



Yours Sincerely


PRINCIPAL
Dr. B.V. R.I.C.E.
Vishnupur, BHIMAVARAM-534 202



SRI Y.N.COLLEGE (Autonomous)
(Affiliated to Adikavi Nannaya University)
Thrice Accredited by NAAC at 'A' Grade
Recognised by UGC as 'College with Potential for Excellence'
NARSAPUR-534 275

Dr.K.Venkateswarlu, M.Sc.(Tech.),Ph.D.
PRINCIPAL(FAC)

Date: 02-02-2020

RELIEVING CERTIFICATE

This is to certify that Sri / Smt./Dr. B.China Veeraswamy, M.Sc.,
Head / Reader / Lecturer/Jr. Lecturer, Department of Computer Science of our
college is relieved of his / her duties on 02/02/ 2020 FN/AN to attend Two days
workshop to be held form 03-02-2020 & 04-02-2020 at B.V.Raju College, Bhimavaram



[Signature]
PRINCIPAL

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Sri Y.N.College (Autonomous)
NAAC Accredited 'A' Grade College
NARSAPUR - 534 276; W.G.Dt., (A.P)



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NARSAPUR-534 275, W.G.Dt., A.P.,

Dr. K Venkateswarlu, M.Sc.(Tech), Ph.D., FIETE
Principal

28th Jan 2020

To
The Principal,
B V Raju College,
Vishnupur,
Bhimavaram.

Respected sir,

Sub: Acceptance of Invitation to Seminar

Thank you for your invitation to the workshop on “**Machine Learning**” hosted by Department of Computer Science, B V Raju College from 03-02-2020 to 04-02-2020.

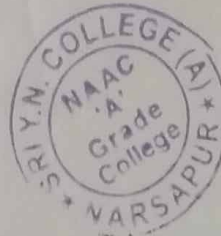
I am happy to inform you that **Mr. B China Veera Swamy, M.Tech HOD of Computer Science** will be the resource person. Please send more information about this workshop directly to my attention.

As mentioned in your letter, this is an excellent opportunity to enhance our working relationship. We look forward to it!.

Thanking you.

Yours Sincerely

PRINCIPAL



PRINCIPAL
Sri Y.N.College (Autonomous)
NAAC Accredited 'A' Grade College
NARSAPUR - 534 275, W.G.Dt., (A.P)

4th Feb 2020

To

Mr B China Veera Swamy,

HOD of Computer Science,

Sri Y N College,

Narsapur.

Dear Sir,

Sub: Letter of Appreciation.

Thank you very much for delivering an informative and thought provoking lecture series on "Machine Learning" held from 3rd Feb 2020 to 4th Feb 2020 at B V Raju College, Vishnupur, Bhimavaram.

It is really a splendid lecture that exposed our students to the field practices. All the students appreciated and got benefitted from your views on the subject.

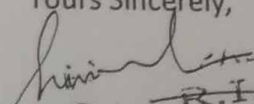
Looking forward for your cooperation for the promotion of compute education in future as well.

Thanking you.



Received Copy.
B. China Veera Swamy

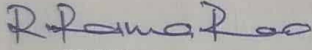
Yours Sincerely,

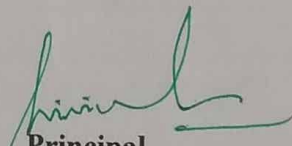

Dr. B. V. R. I. C.
Vishnupur, BHIMAVARAM-534 202

CIRCULAR

Date: 30th Jan 2020

It is informed to that; the department of Computer Science is conducting a Two-Day workshop on “**Machine Learning**” for III BSc II Semester students by **Mr. B China Veera Swamy, M.Tech HOD of Computer Science Sri Y N College Narsapur** from 03-02-2020 to 04-02-2020. Interested students could consult Mr A V Satyanarayana Raju to enroi your names.


HOD


Principal
PRINCIPAL
Dr. B.V. R.E.C.E.
Vishnupur, BHIMAVARAM-534 202

B V Raju College: Vishnupur::Bhimavaram
A Two Day Workshop on Machine Learning
From 03-02-2020 to 04-02-2020
Attendance Sheet - 03-02-2020

Sl.No	Roll.No	Student Name	Attendance	
			Morning	Afternoon
1	173117102103	PARABATTULA GOWRI SIRISHA	P. Gowri Sirisha	P. Gowri Sirisha
2	173117102111	ROMPICHARLA SRIVALLI	R. Srivalli	R. Srivalli
3	173117102113	RUDRARAJU G N L PRASANNA	R. Prasanna	R. Prasanna
4	173117102120	YERRA YAMINI LAKSHMI	Y. Yamini Lakshmi	Y. Yamini Lakshmi
5	173117109132	CHITTIBOINA LEELA MANUSHA	Ch. L. Manusha	Ch. L. Manusha
6	173117109136	GANDHARAPU S P PHANI KUMARI	G. Phani	G. Phani
7	173117109138	GUNTU SINDHU	G. Sindhu	G. Sindhu
8	173117109139	GUNTURI C S SINDHU	G. C. S. Sindhu	G. C. S. Sindhu
9	173117109142	KADIYAM DANESWARI	K. Daneswari	K. Daneswari
10	173117109160	NUTHAKKI GOWTHAMI	N. Gowthami	N. Gowthami
11	173117109166	POTTI JYOTHI	P. Jyothi	P. Jyothi
12	173117109180	VANGIPURAPU YAMINI HARI PRIYA	V. Yamini	V. Yamini
13	173117137244	AJJUMPUDI VENKATA VAMSI KRISHNA	A. V. Vamsi Krishna	A. V. Vamsi Krishna
14	173117137256	BANDARU REVANTH	B. Revanth	B. Revanth
15	173117137279	INAPARTHI BHASKAR	I. Bhaskar	I. Bhaskar
16	173117137302	KOTTU KARTHIK	K. Karthik	K. Karthik
17	173117137303	KROVVIDI VANI VEERA VENKATA BHAVA DURGA	K. V. V. B. Durga	K. V. V. B. Durga
18	173117137308	MALLADI VAMSI SAI CHANDU	M. V. S. Chandu	M. V. S. Chandu
19	173117137310	MANGINA YESU BABU	M. Yesu Babu	M. Yesu Babu
20	173117137314	MUTHYALA NAGA SAI DILEEP KUMAR	M. N. S. Dilip Kumar	M. N. S. Dilip Kumar
21	173117137322	NIMMALA VIJAY KUMAR	N. Vijay	N. Vijay
22	173117137327	PENMETS A GEETHIKA	P. Geethika	P. Geethika
23	173117137331	POLIREDDI ROHINI DEVI	P. Rohini Devi	P. Rohini Devi
24	173117137355	VENDRA ADITYA KUMAR	V. Aditya Kumar	V. Aditya Kumar

B V Raju College: Vishnupur::Bhimavaram
A Two Day Workshop on Machine Learning
From 03-02-2020 to 04-02-2020
Attendance Sheet - 04-02-2020

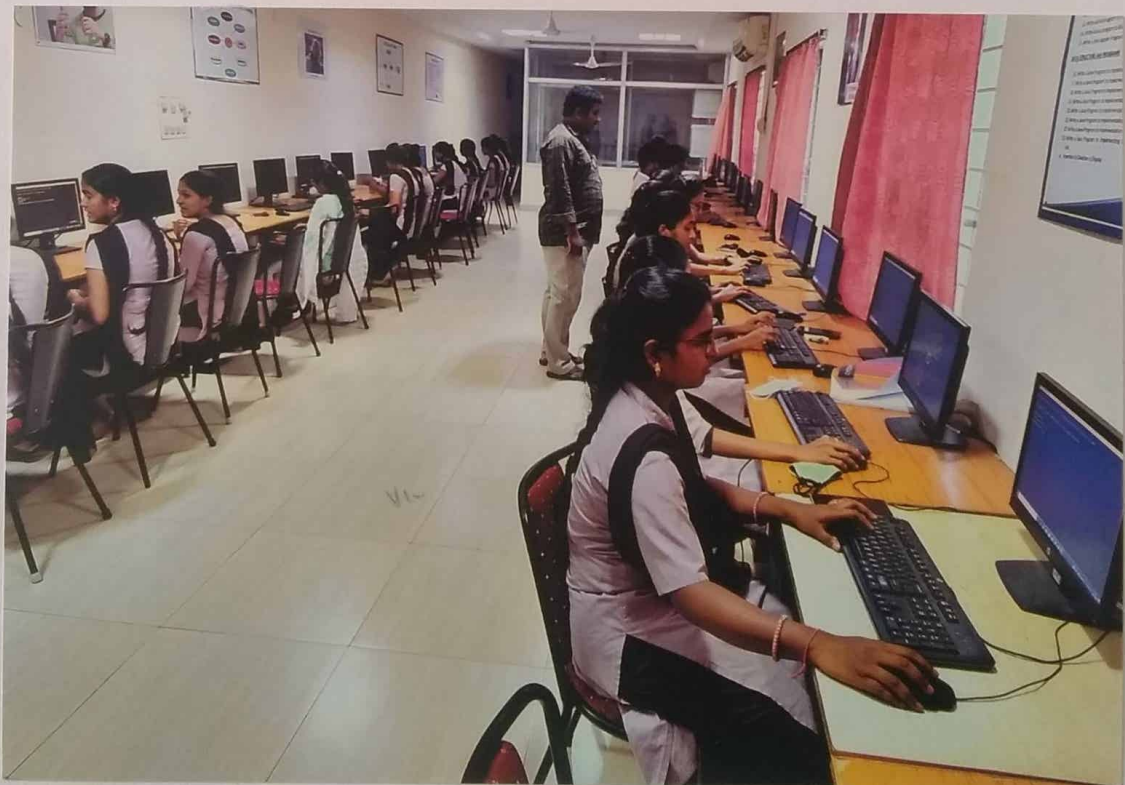
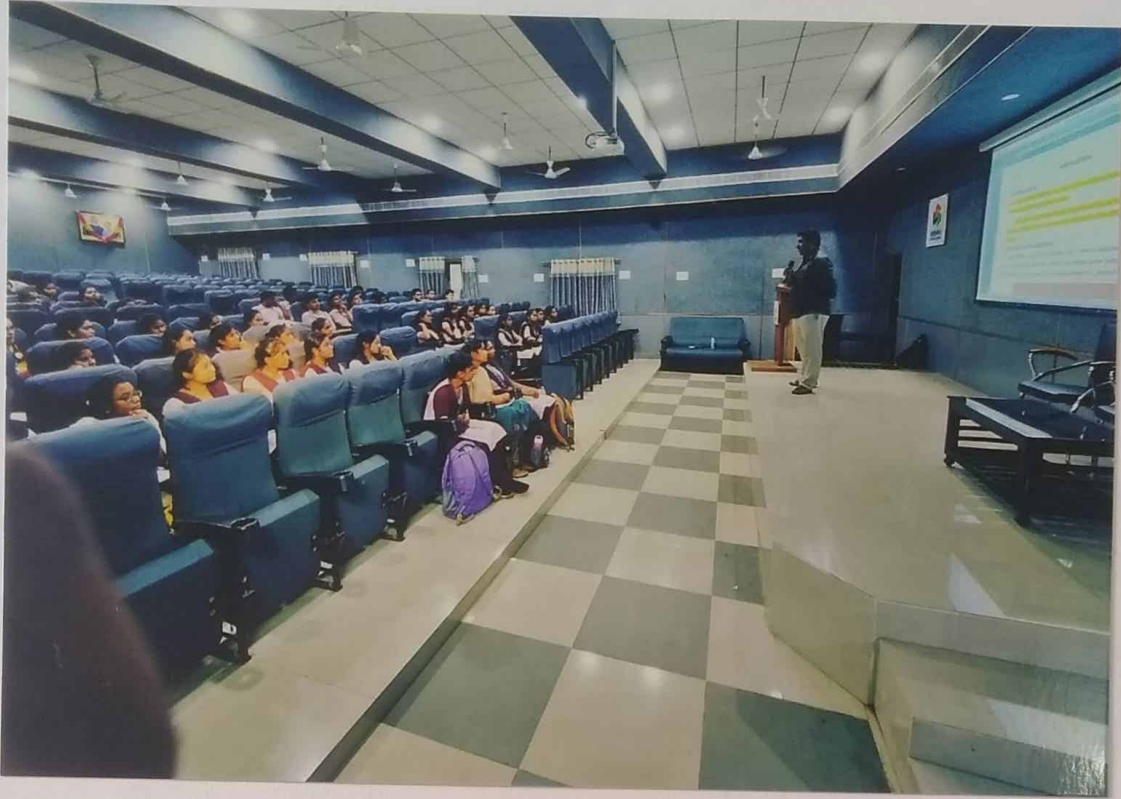
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5	173117109132	CHITTIBOINA LEELA MANUSHA	Ch. L. Manusha	Ch. L. Manusha
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7	173117109138	GUNTU SINDHU	G. Sindhu	G. Sindhu
8	173117109139	GUNTURI C S SINDHU	C. S. Sindhu	C. S. Sindhu
9	173117109142	KADIYAM DANESWARI	K. Daneswari	K. Daneswari
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12	173117109180	VANGIPURAPU YAMINI HARI PRIYA	V. Yamini	V. Yamini
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Machine Learning
by Ms. B. China Veeja Swamy, HOD of CS
Sri Y. N. College, Narsapur.



PRINCIPAL
B.V. VISHNU COLLEGE
VISHNUPUR, BHIMAVARAM-534 202

Machine Learning
by. Mr. B. chitra Veera Suresh, HOD of CS
Sri Y.N. college, Nagpur.



PRINCIPAL
B.V. RAJU COLLEGE
VISHNUPUR, BHIMAVARAM-534 202

Machine Learning with Python

B China Veera Swamy
HOD, Dept., of Computer Science
Sri Y N College
Narsapur

Topics to be covered.....

- Introduction to Machine Learning
- Supervised Learning
- Unsupervised Learning
- Python libraries for Machine Learning

What is Machine Learning?

- The capability of Artificial Intelligence systems to learn by extracting patterns from data is known as Machine Learning.
- Machine Learning is an idea to learn from examples and experience, without being explicitly programmed. Instead of writing code, you feed data to the generic algorithm, and it builds logic based on the data given.

Introduction to Machine Learning

- Python is a popular platform used for research and development of production systems. It is a vast language with number of modules, packages and libraries that provides multiple ways of achieving a task.
- Python and its libraries like NumPy, Pandas, SciPy, Scikit-Learn, Matplotlib are used in data science and data analysis. They are also extensively used for creating scalable machine learning algorithms.

- Python implements popular machine learning techniques such as Classification, Regression, Recommendation, and Clustering.
- Python offers ready-made framework for performing data mining tasks on large volumes of data effectively in lesser time

What is Machine Learning?

- Data science, machine learning and artificial intelligence are some of the top trending topics in the tech world today. Data mining and Bayesian analysis are trending and this is adding the demand for machine learning.
- Machine Learning
 - Study of algorithms that improve their performance at some task with experience

- Machine learning is a discipline that deals with programming the systems so as to make them automatically learn and improve with experience.
- Here, learning implies recognizing and understanding the input data and taking informed decisions based on the supplied data.
- It is very difficult to consider all the decisions based on all possible inputs. To solve this problem, algorithms are developed that build knowledge from a specific data and past experience by applying the principles of statistical science, probability, logic, mathematical optimization, reinforcement learning, and control th

ML

Machine Learning (ML) is an automated learning with little or no human intervention. It involves programming computers so that they learn from the available inputs. The main purpose of machine learning is to explore and construct algorithms that can learn from the previous data and make predictions on new input data.

Growth of Machine Learning

- Machine learning is preferred approach to
 - Speech recognition, Natural language processing
 - Computer vision
 - Medical outcomes analysis
 - Robot control
 - Computational biology
- This trend is accelerating
 - Improved machine learning algorithms
 - Improved data capture, networking, faster computers
 - Software too complex to write by hand
 - New sensors / IO devices
 - Demand for self-customization to user, environment
 - It turns out to be difficult to extract knowledge from human experts → failure of expert systems in the 1980's.

Applications of Machine Learning Algorithms

- The developed machine learning algorithms are used in various applications such as:

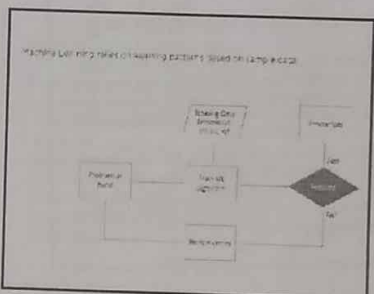
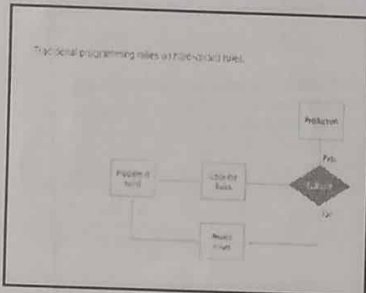
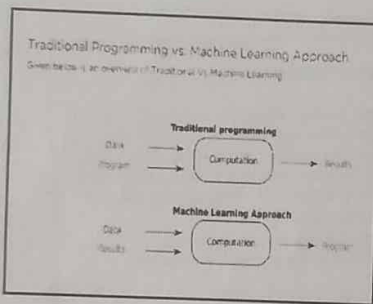
<ul style="list-style-type: none"> Web search Computational biology Finance E-commerce Space exploration Robotics Information extraction Social networks Debugging Data mining Expert systems Robotics 	<ul style="list-style-type: none"> Vision processing Language processing Forecasting things like stock market trends, weather Pattern recognition Games [Your favorite areas]
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Benefits of Machine Learning

- Powerful Processing
- Better Decision Making & Prediction
- Quicker Processing
- Accurate
- Affordable Data Management
- Inexpensive
- Analyzing Complex Big Data

Steps Involved in Machine Learning

- A machine learning project involves the following steps:
 - Defining a Problem
 - Preparing Data
 - Evaluating Algorithms
 - Improving Results
 - Presenting Results



Magic?

No, more like gardening

- Seeds = Algorithms
- Nutrients = Data
- Gardener = You
- Plants = Programs

So what the machine learning is...

- Automating automation
- Getting computers to program themselves
- Writing software is the bottleneck
- Let the data do the work instead!

Machine Learning Techniques

Given below are some techniques in this Machine Learning tutorial.

- Classification
- Categorization
- Clustering
- Trend analysis
- Anomaly detection
- Visualization
- Decision making

ML in a Nutshell

- Machine Learning is a sub-set of Artificial Intelligence where computer algorithms are used to autonomously learn from data and information. Machine learning computers can change and improve their algorithms all by themselves.
- Tens of thousands of machine learning algorithms
- Every machine learning algorithm has three components:
 - Representation
 - Evaluation
 - Optimization

Representation

- Decision trees
- Sets of rules / Logic programs
- Instances
- Graphical models
- Neural networks
- Support vector machines (SVM)
- Model ensembles
- etc.....

Evaluation

- Accuracy
- Precision and recall
- Squared error
- Likelihood
- Posterior probability
- Cost / Utility
- Margin
- Entropy
- K-L divergence
- Etc.

Optimization

- Combinatorial optimization
 - Eg: Greedy search
- Convex optimization
 - Eg: Gradient descent
- Constrained optimization
 - Eg: Linear programming

Features of Machine Learning

- Let us look at some of the features of Machine Learning.
- Machine Learning is computing-intensive and generally requires a large amount of training data.
 - It involves repetitive training to improve the learning and decision making of algorithms.
 - As more data gets added, Machine Learning training can be automated for learning new data patterns and adapting its algorithm.

Machine Learning Algorithms

- Machine Learning can learn from labeled data (known as supervised learning) or unlabelled data (known as unsupervised learning).
- Machine Learning algorithms involving unlabelled data, or unsupervised learning, are more complicated than those with the labeled data or supervised learning.
- Machine Learning algorithms can be used to make decisions in subjective areas as well.

Examples

- Logistic Regression can be used to predict which party will win at the ballots.
- Naive Bayes algorithm can separate valid emails from spam.
- Face detection: Identify faces in images (or indicate if a face is present).
- Email filtering: Classify emails into spam and not-spam.
- Medical diagnosis: Diagnose a patient as a sufferer or non-sufferer of some disease.
- Weather prediction: Predict, for instance, whether or not it will rain tomorrow.

Concepts of Learning

- Learning is the process of converting experience into expertise or knowledge.
- Learning can be broadly classified into three categories, as mentioned below, based on the nature of the learning data and interaction between the learner and the environment.
 - Supervised Learning
 - Unsupervised Learning
 - Semi-supervised learning

Types of Learning

- Supervised (inductive) learning
 - Training data includes desired outputs
- Unsupervised learning
 - Training data does not include desired outputs
- Semi-supervised learning
 - Training data includes a few desired outputs
- Reinforcement learning
 - Rewards from sequence of actions

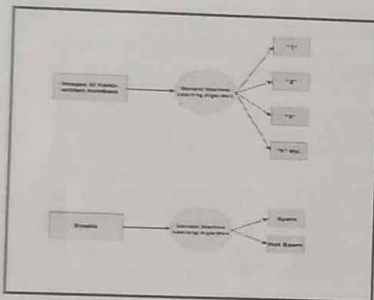
- Similarly, there are four categories of machine learning algorithms as shown below:

- Supervised learning algorithm
- Unsupervised learning algorithm
- Semi-supervised learning algorithm
- Reinforcement learning algorithm

Supervised Learning

- A majority of practical machine learning uses supervised learning.
- In supervised learning, the system tries to learn from the previous examples that are given. (On the other hand, in unsupervised learning, the system attempts to find the patterns directly from the example given.)
- Speaking mathematically, supervised learning is where you have both input variables (x) and output variables (Y) and can use an algorithm to derive the mapping function from the input to the output.
- The mapping function is expressed as $Y = f(X)$.

- When an algorithm learns from example data and associated target responses that can consist of numeric values or string labels, such as classes or tags, in order to later predict the correct response when posed with new examples comes under the category of Supervised learning.
- This approach is indeed similar to human learning under the supervision of a teacher. The teacher provides good examples for the student to memorize, and the student then derives general rules from these specific examples.



Categories of Supervised learning

- Supervised learning problems can be further divided into two parts, namely **classification**, and **regression**.
- **Classification:** A classification problem is when the output variable is a category or a group, such as "black" or "white" or "spam" and "no spam".
- **Regression:** A regression problem is when the output variable is a real value, such as "Rupees" or "height."

Unsupervised Learning

- In unsupervised learning, the algorithms are left to themselves to discover interesting structures in the data.
- Mathematically, unsupervised learning is when you only have input data (X) and no corresponding output variables.
- This is called unsupervised learning because unlike supervised learning above, there are no given correct answers and the machine itself finds the answers.

Categories of Unsupervised learning

- Unsupervised learning problems can be further divided into **association** and **clustering** problems.
- **Association:** An association rule learning problem is where you want to discover rules that describe large portions of your data, such as "people that buy X also tend to buy Y".
- **Clustering:** A clustering problem is where you want to discover the inherent groupings in the data, such as grouping customers by purchasing behaviour.

Reinforcement Learning

- A computer program will interact with a dynamic environment in which it must perform a particular goal (such as playing a game with an opponent or driving a car). The program is provided feedback in terms of rewards and punishments as it navigates its problem space.
- Using this algorithm, the machine is trained to make specific decisions. It works this way: the machine is exposed to an environment where it continuously trains itself using trial and error method.

- Unsupervised learning is used to detect anomalies, outliers, such as fraud or defective equipment, or to group customers with similar behaviours for a sales campaign. It is the opposite of supervised learning. There is no labelled data here.
- When learning data contains only some indications without any description or labels, it is up to the coder or to the algorithm to find the structure of the underlying data, to discover hidden patterns, or to determine how to describe the data. This kind of learning data is called **unlabeled data**.

- Here learning data gives feedback so that the system adjusts to dynamic conditions in order to achieve a certain objective. The system evaluates its performance based on the feedback responses and reacts accordingly. The best known instances include self-driving cars and chess master algorithm AlphaGo.

Semi-supervised learning

- If some learning samples are labeled, but some other are not labeled, then it is semi-supervised learning. It makes use of a large amount of **unlabeled data for training** and a small amount of **labeled data for testing**. Semi-supervised learning is applied in cases where it is expensive to acquire a fully labeled dataset while more practical to label a small subset.
- **For example**, it often requires skilled experts to label certain remote sensing images, and lots of field experiments to locate oil at a particular location, while acquiring unlabeled data is relatively easy.

- Here an incomplete training signal is given: a training set with some (often many) of the target outputs missing. There is a special case of this principle known as **Transduction** where the entire set of problem instances is known at learning time, except that part of the targets are missing.

Categorizing on the basis of required Output

Another categorization of machine learning tasks arises when one considers the desired output of a machine-learned system:

- **Classification** : When inputs are divided into two or more classes, and the learner must produce a model that assigns unseen inputs to one or more (multi-label classification) of these classes. This is typically tackled in a supervised way. Spam filtering is an example of classification, where the inputs are email (or other) messages and the classes are "spam" and "not spam".
- **Regression** : Which is also a supervised problem, A case when the outputs are continuous rather than discrete.
- **Clustering** : When a set of inputs is to be divided into groups. Unlike in classification, the groups are not known beforehand, making this typically an unsupervised task.

Libraries and Packages

- To understand machine learning, you need to have basic knowledge of Python programming. In addition, there are a number of libraries and packages generally used in performing various machine learning tasks as listed below:
 - **numpy** - is used for its N-dimensional array objects
 - **pandas** - is a data analysis library that includes dataframes
 - **matplotlib** - is 2D plotting library for creating graphs and plots
 - **scikit-learn** - the algorithms used for data analysis and data mining tasks
 - **seaborn** - a data visualization library based on matplotlib

B V RAJU COLLEGE

VISHNUPUR::BHIMAVARAM

DEPARTMENT OF COMPUTER SCIENCE

EVENT NAME: machine learning

DATE: 4/2/2020

PARTICIPANT FEEDBACK FORM

Name of the Student

: K. Karthik

Register Number

: 173117137302

Course & Group

: MEGS

Contact Number

: 889 7996 44

Email ID

: Kottu Karthik 302 .@ gmail . com

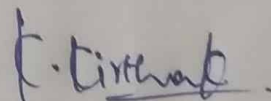
Future events you are expecting :

How do you rate the event conducted: 1/2/3/4/5

Are you satisfied with event conduction: Yes/No

Comments or Suggestions

: Nothing


Signature of the student

B V RAJU COLLEGE

VISHNUPUR::BHIMAVARAM

DEPARTMENT OF COMPUTER SCIENCE

EVENT NAME: Machine Learning

DATE: 4/02/2020

PARTICIPANT FEEDBACK FORM

Name of the Student : N. Vijay kumar
Register Number : 173117137322
Course & Group : MECS
Contact Number : 9912944112
Email ID : vijaykumar.vimmala
Future events you are expecting :
How do you rate the event conducted: 1/2/3/4/5
Are you satisfied with event conduction: Yes/No
Comments or Suggestions : Nothing

N. vijay kumar
Signature of the student

B V RAJU COLLEGE

VISHNUPUR::BHIMAVARAM

DEPARTMENT OF COMPUTER SCIENCE

EVENT NAME: Machine Learning

DATE: 4/02/2020

PARTICIPANT FEEDBACK FORM

Name of the Student : P. Rohini Devi
Register Number : 173117137331
Course & Group : IIIrd MScs.
Contact Number : 6305448279
Email ID : Rohini.devi@gmail.com.
Future events you are expecting :
How do you rate the event conducted: 1/2/3/4/5
Are you satisfied with event conduction: Yes/No
Comments or Suggestions : No suggestions.

P. Rohini
Signature of the student

B V RAJU COLLEGE

VISHNUPUR::BHIMAVARAM

DEPARTMENT OF COMPUTER SCIENCE

EVENT NAME: Machine Learning

DATE: 4/2/2020

PARTICIPANT FEEDBACK FORM

Name of the Student : B. Revanth
Register Number : 173117137256
Course & Group : IIIrd MECS
Contact Number : 7702648212
Email ID : Revanth.bandaru@gmail.com
Future events you are expecting :
How do you rate the event conducted: 1/2/3/4/5 ✓
Are you satisfied with event conduction: Yes/No ✓
Comments or Suggestions : No

B. Revanth...
Signature of the student

B V RAJU COLLEGE

VISHNUPUR::BHIMAVARAM

DEPARTMENT OF COMPUTER SCIENCE

EVENT NAME: machine learning

DATE: 4/2/2020

PARTICIPANT FEEDBACK FORM

Name of the Student : P. Jyothi
Register Number : 173117109166
Course & Group : IIIrd MSCS
Contact Number : 6305448279
Email ID : Jyothi.Potti@gmail.com

Future events you are expecting :

How do you rate the event conducted: 1/2/3/4/5

Are you satisfied with event conduction: Yes/No

Comments or Suggestions : Nothing

P. Jyothi
Signature of the student

B V RAJU COLLEGE

VISHNUPUR::BHIMAVARAM

DEPARTMENT OF COMPUTER SCIENCE

EVENT NAME: Machine learning

DATE: 4/02/2020

PARTICIPANT FEEDBACK FORM

Name of the Student : R. Srivalli
Register Number : 173117102111
Course & Group : IIIrd MPCS
Contact Number : 8008542827
Email ID : srivalli.r111@gmail.com
Future events you are expecting :
How do you rate the event conducted: 1/2/3/4/5
Are you satisfied with event conduction: Yes/No
Comments or Suggestions : NO COMMENTS

R. Srivalli
Signature of the student