Coding Club
Central University of Haryana

Azadi Ka Amrit mahotsav

Five Days Workshop (Hybrid Mode)
on
Exploring Machine Learning with Python

17th April to 21st April, 2024

Organized by:

Coding Club
Central University of Haryana
Mahendergarh, Haryana(123031)
(NAAC Accredited 'A' Grade University)

About Our University

Central University of Haryana is one of the fifteen new Central Universities established by Ministry of Human Resource Development, Government of India in XI Five Year Plan (2007-2012) under the Central University Act-2009 of the Parliament. The University has been accredited with "A" grade in the second cycle of NAAC assessment in August 2023. The University has been listed among the top 150-200 Universities in NIRF ranking. The University is fully funded by University Grant Commission (UGC). Permanent Campus of the University is situated in 484 acres of land at Jant-Pali Villages, Mahendergarh District of Haryana from where CUH is running its academic operations. Presently the University offers 83 academic programmes (UG/PG/Research).

University's Coding Club

Today's fast developing world needs technically proficient individuals with programming skills who can contribute to the technological advancement. Hence fostering these abilities in young minds is crucial. Coding club was established on 27th December 2023 with the aim to promote a coding culture on campus by engaging all interested students. This club has following objectives:

- Enhancing coding skills of students through teaching.
- Conducting various kinds of coding competitions.
- Organizing trainings on various technologies.
- Conducting workshops on various areas of computer science field specifically related to IT field/ research etc.
- To represent the university in inter-collegiate events.
- Take part in competitions like ACM's ICPC, Google's CodeJam, Google Summer of Code (GSoC), and other online coding events.

About Machine Learning Course with Python

Workshop on Machine Learning with Python is tailored to achieve specific objectives that integrate Python programming with machine learning concepts. Here are some common objectives:

1. **Introduction to Machine Learning and essential Python Libraries:** This workshop will attempt to provide a glimpse related to basic notions of machine learning. It will cover supervised, unsupervised, and reinforcement learning concepts for supervised, unsupervised, and semi-supervised data. It will introduce to the participants about popular machine learning libraries in Python, such as Numpy, Pandas, Matplotlib, scikit-learn, TensorFlow, Keras, and PyTorch. Participants learn how to leverage these libraries to implement machine learning algorithms efficiently.
2. **Python Proficiency:** Enhancing participants' proficiency in using Python for machine learning tasks. This may include familiarity with essential libraries such as NumPy, pandas, matplotlib, and scikit-learn.
3. **Hands-on Practice:** Providing hands-on practice sessions where participants work on coding exercises and projects to reinforce their understanding of machine learning concepts. These exercises often cover data pre-processing, model building, evaluation, and deployment using Python.

4. **Data Handling and Visualization:** Teaching participants how to preprocess and visualize data effectively using Python libraries like pandas and matplotlib. This includes tasks such as data cleaning, feature engineering, and exploratory data analysis.
5. **Model Building and Evaluation:** Guiding participants through the process of building machine learning models using Python, including selecting appropriate algorithms, training models, tuning hyper-parameters, and evaluating model performance using cross-validation techniques.
6. **Real-world Applications:** Demonstrating how machine learning techniques can be applied to real-world problems and datasets using Python. This may involve case studies or examples from various domains such as finance, healthcare, marketing, or image recognition.
7. **Deployment and Integration:** Discussing strategies for deploying machine learning models into production environments and integrating them with existing systems or applications using Python frameworks like Flask or Django.
8. **Advanced Topics:** Introducing advanced topics in machine learning and Python programming as time allows. This may include deep learning, natural language processing (NLP), computer vision, and other specialized areas.
9. **Collaborative Learning Environment:** Fostering a collaborative learning environment where participants can exchange ideas, ask questions, and share insights with peers and instructors. This may include group discussions, pair programming exercises, or code reviews.
10. **Feedback and Support:** Providing participants with feedback and support throughout the workshop to address any challenges they encounter and ensure a positive learning experience. This may involve one-on-one assistance from speakers, as well as periodic assessments to gauge participants' progress.
11. **Problem-solving Sessions:** Conducting problem-solving sessions where participants can discuss challenges they face in applying machine learning techniques to their specific projects or domains. This fosters collaboration and peer learning among participants.

Major Topics to be covered in the Machine Learning and Python

1. Introduction to machine learning and its types. Different application areas of Machine Learning.
2. Basics of Python and machine learning libraries in Python, such as Numpy, Pandas, Matplotlib, scikit-learn, TensorFlow, Keras, and PyTorch etc.
3. Pre-processing techniques such as discretization, missing value imputation, and dimensionality reduction etc.
4. Validation techniques to avoid overfitting and underfitting issues during training of models
5. Confusion matrix based different evaluation metrics and their applications
6. Nearest neighbor methods for both supervised and unsupervised learning
7. Discussion of Naive Bayes, decision tree, support vector machine classifiers
8. Linear and Logistic Regression techniques
9. Basics of clustering and its types. Illustration of K-means and hierarchical clustering methods
10. Apriori Algorithm for Association Rule Mining
11. Ensemble Methods: Stacking, Bagging and Boosting

Resource Persons/ Experts

The Resource Persons/Experts are prominent professors and scholars in the field of statistics and data science with excellent knowledge of artificial intelligence and machine learning. They have extensive experience in the applications of machine learning algorithms with Python.

Target Audience

The main target audience for this workshop are BTech/MCA/MSc/MBA/M.Phil./Ph.D./PDF research scholars from various Indian universities and academic institutions who are handling large volume of datasets in their domain.

Specific Objectives of Machine Learning Course

- To understand the basic theory underlying machine learning.
- To be able to formulate machine learning problems corresponding to different applications.
- To understand a range of machine learning algorithms along with their strengths and weaknesses.
- To be able to apply machine learning algorithms to solve problems of moderate complexity.
- To apply the algorithms to a real-world problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models.

Learning Outcomes of the Machine Learning Course

After completing this course, the student will be able to

- Appreciate the importance of visualization in the data analytics solution
- Apply structured thinking to unstructured problems
- Understand a very broad collection of machine learning algorithms and problems
- Learn algorithmic topics of machine learning and mathematically deep enough to introduce the required theory
- Develop an appreciation for what is involved in learning from data.

Eligibility Criteria

The course is meant for all who are currently pursuing their BTech/MCA/MSc/MBA/M. Phil./Ph.D./PDF Scholars in any discipline in UGC recognized Universities and research institutes across India.

Intake

The intake for the course shall be a maximum of 30 (10 from local, 10 from Haryana state other than local, and 10 from outside the Haryana state) participants from any discipline.

Important Points

- Registration will be done on a first come first serve basis.
- Personal laptop is compulsory for every participant.
- No leave of any kind is permitted during the course period.

Certificate

At the end of the Workshop, the certificate will be issued to the participants who will complete the assignments and attendance.

Registration Fee

Outside Participants will pay Rs. 500/- as registration fee. Participants are required to submit the fee receipt on 17th April, 2024 at 11:00am.

Accommodation

Accommodation will be provided to the outstation participants only on Payment basis.

How to Apply

Interested candidates can apply for the course by filling and submitting an **online registration form by attaching a signed and scanned copy of the registration form (see last page) (the original registration form should be produced on the first day of workshop)** and candidates can register themselves by filling following **Google form:**

For Inside Participants:

https://docs.google.com/forms/d/e/1FAIpQLSeTopSVRB3Vb35rFkbzHfpZv4tcaC-9kGQ_whQOVSH7zq8k0g/viewform?usp=sf_link

For Outside Participants:

https://docs.google.com/forms/d/e/1FAIpQLSfMfTORPV4UHVlv9O05Fp1gMaPhuLyIuDtQZ3mHBcgn7ezeiA/viewform

Registration link

Participants can also find the Workshop brochure and registration link by visiting the Central University of Haryana official website: www.cuh.ac.in

Important Dates

- Last Date for Registration: 14th April, 2024
- Confirmation mail to the participant: 15th April, 2024
- Period of Workshop: 17th-21st April, 2024

How to Reach the Venue

If you are coming from Delhi or Gurgaon (Distance-125Kms.), come through NH-08 and after crossing Dharuhera, turn right for Rewari. Then, follow the Mahendergarh road until you reach Mahendergarh. From there continue for 8 kms. towards Charkhi Dadri and you will find CUH Gate No.1 on Road. From there you can reach University Academic Block & Administration Block. If you are coming from Jaipur (Distance-190Kms.), then reach Mahendergarh via Behror and then Narnaul. Those coming via Rohtak, may reach University via Charkhi Dadri as University is at the distance of just 27 km from Charkhi Dadri on Mahendergarh Road.

Central University of Haryana, Mahendergarh, Haryana

Five Days Workshop (Hybrid Mode)

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Exploring Machine Learning with Python

Coding Club
Central University of Haryana

For BTech/MTech/MCA/Msc/M.Phil./Ph.D/PDF Scholars

conducted by Coding Club,

Central University of Haryana

(17th April to 21st April, 2024)

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REGISTRATION FORM

(selection will be on "First Come First Serve" basis)

1. Name (IN BLOCK LETTERS): ……..……..
2. Name & Address of the University/College/Institute: ……...
   .....……
3. Transection ID* (For Outstation Participants Only)……..
4. Name of the Department: ……
5. BTech/MTech/MCA/Msc/M.Phil./Ph.D/PDF Registration date: ……. ……..…….....
6. Title of your BTech/MTech/MCA/Msc/M.Phil./Ph.D/PDF research work (if finalized):
   ……
   ……
7. Stage of Research work: ……..……
8. Highest Academic Qualification: ……..……
9. Email Id: ……Mobile No.*: ……..……
10. Have you attended any research methodology course earlier (Yes or No)? .....……..
    If yes, Mention Date andPlace…….....
11. Address for Communication: …… ……...
    ……
12. Accommodation required (Yes / No): ……..……..
    (Applicable to the outstation candidates only)

"All the information provided above is true to the best of my knowledge and if found incorrect/ misleading then appropriate action can be taken accordingly."

Signature of Supervisor/HOD of the Institution
(With Stamp)
Place:
Date:

Signature of Participant

The hard copies should be submitted at the time of reporting for the workshop. For any query, **please contact:** 7006098801/9068165404

*List of selected candidates will be communicated by 15th April, 2024