DATE: 23/07/2020

The Department of Applied Sciences and Humanities conducted a workshop on "An Introduction to Optimization in Machine Learning" from 13$^{th}$ July to 17$^{th}$ July (5-7pm) via Zoom online platform. The inauguration of the workshop was on 13$^{th}$ July at 5pm, which was graced by the Director Fr. Dr. John Rose S.J., Principal Dr Y.D.Venkatesh, the Heads of Departments of Computer Engineering, Information technology, Electronics and telecommunication Engineering, the Deans, the faculty and non-teaching staff members of XIE. The key note address was delivered by Prof Rakesh Prasad Badoni, from the School of Computer Engineering, Xavier University Bhuvaneswar. His talk was on the real-life applications of optimization and how heuristic algorithms can solve many of such problems. The participants of the workshop were a mixed crowd of 35 from XIE and 14 from colleges all over Mumbai and India.

The sessions were conducted by Dr Madhavi Parimi. The topics covered included introduction to Machine learning, introduction to optimization and its importance in the context of Machine learning, various first order optimization algorithms, the role of convexity in finding the gradient of the objective function, linear regression, classification, clustering and their implementation using MATLAB. The students were asked to submit three quizzes and a problem statement so as to receive the completion certificates.

The first three winners of the quiz were announced and appreciated by Fr Dr John Rose S.J. and Principal Sir who graced the valedictory function at 6:40pm on 17$^{th}$ July 2020. The winners were Ms Harshini Moorti from St Xavier's College, Fort, Mumbai, Ms Leerika Thakur from St Johns College of Engineering Palghar and Ms Anjaly Sam from St Xavier's College, Fort, Mumbai. Ms Harshini shared her views about the workshop and said it helped her in getting the basics cleared. Also, the first three toppers in the quiz from XIE were appreciated by the Director.

**Event Coordinator**

Dr. Ashutosh Valavade

**Guest Speaker:**

Dr Madhavi Parimi

**Time & Place:**

13$^{th}$-17$^{th}$ July 2020

5-7 p.m.

**Department:**

Applied Sciences & Humanities.

**No of participants:**

50

Dr. Ashutosh Valavade
Coordinator of the workshop

Dr. Madhavi Parimi
HoD- (Applied Sciences and Humanities)

Student Feedback and Benefits:

- *The workshop gave me deeper insights in Optimization with Machine Learning. Dr. Madhavi mam elaborated important concepts with ease and explaining how things work at the back and meticulously explaining various aspects of Machine Learning. I am glad that I was a part of this workshop. Please keep me updated for any similar impending workshops.-Rahul Vemuri*
- The whole concept of how a machine learns was quite new to me and I am sure some of my classmates. It was great how simple algorithms can predict seemingly difficult tasks with ease.Would certainly like to read more about it. Looking forward to more such workshops in the future- Kriti Goel
- *This workshop was very beneficial for me. The concepts could be easily understood because of the simple explanations and examples used- Harshini Moorti*
- It was good. I receive more knowledge related to machine learning through the workshop- Anjaly Sam

Images

**Non-XIE Participants**

| Sr. No | Email Address | Name of the student | QUIZ 1 | QUIZ 2 | QUIZ 3 | Total Marks (Out of 30) | |
|---|---|---|---|---|---|---|---|
| 1 | harshinihhm@gmail.com | Harshini Moorthy | 9 | 9 | 9 | 27 | 1 |
| 2 | leerikathakur8@gmail.com | Leerika Thakur | 8 | 8 | 10 | 26 | 2 |
| 3 | anjalysam07@gmail.com | ANJALY SAM | 9 | 8 | 6 | 23 | 3 |
| 4 | bincythomas80090@gmail.com | BINCY THOMAS | 9 | 6 | 6 | 21 | |
| 5 | sanjanaaniwar@gmail.com | Sanjana Tipanna Aniwar | 7 | 9 | 5 | 21 | |
| 6 | sudharahul2010@gmail.com | Rahul Vemuri | 9 | 7 | 4 | 20 | |
| 7 | nikitakulkarni1808@gmail.com | Ms. Nikita Subhash Kulkarni | 9 | 5 | 5 | 19 | |
| 8 | ashlyjohnsonmj@gmail.com | Ashly Johnson | 7 | 6 | 5 | 18 | |
| 9 | shivanidugade59@gmail.com | Shivani Rajendra Dugade. | 9 | 6 | 2 | 17 | |
| 10 | veenabadgujar23629@gmail.com | Veena Rajesh Badgujar | 7 | 8 | 2 | 17 | |
| 11 | siddharthanvekar1@gmail.com | Siddharth Anvekar | 5 | 6 | 5 | 16 | |
| 12 | hridayashinde@gmail.com | Hridaya Shinde | | | | | |
| 13 | khyati199999@gmail.com | Khyati Khandelwal | | | | | |
| 14 | sumit.gupta28092018@gmail.co | Sumit Sanjay Gupta | | | | | |

0:14:34 �II ↻      17:28      Next slide
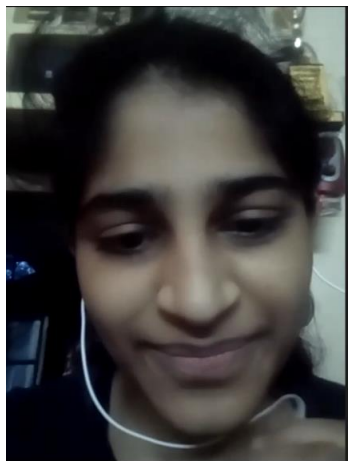
## How to define the optimization problem?

- The optimization problem will have an objective function which we either try to minimize or maximize.
- This objective function is maximized or minimized, subject to some constraints.
- These constraints are restrictions, such as the labor available for product manufacturing, or the minimum number of hours needed to manufacture a product.
- Similar to objective, constraints are also a function of decision variables. An optimal value is a feasible solution that generates the minimum or maximum objective function value.
- An optimal solution must satisfy all the constraints and give the largest or smallest value of the objective function.

So these are the in order to define optimization problem So we must have the objective function we must

How to formulate optimization pro

No Notes.

---
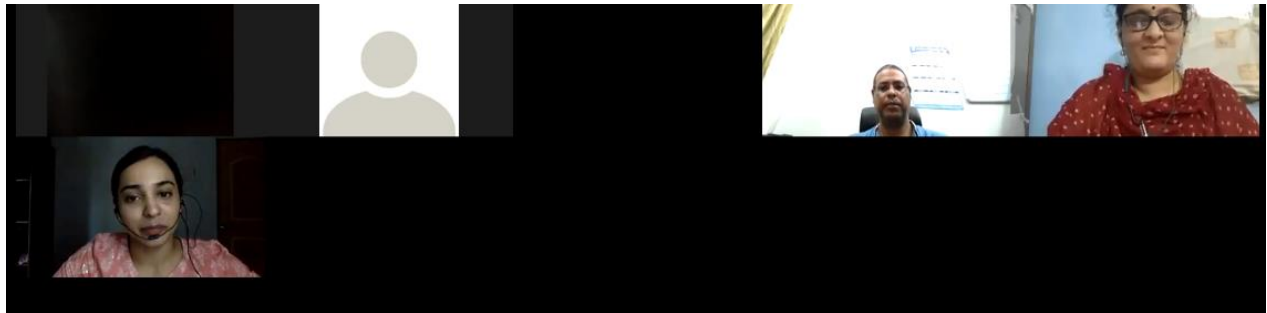


---

MATLAB R2014a

```
86      %  Predict probability for a student with score 45 on exam 1
87      %  and score 85 on exam 2
88 -    sam=[1 45 85];
89 -    prob = sigmoid([sam] * theta);
90 -    fprintf(['For a student with scores 45 and 85, we predict an admission ' ...
91              'probability of %f\n\n'], prob);
92      %plotData(sam,prob);
93      %plot(sam(:,2:3), prob,'*', 'Color','r','Markersize',200);
94      % Put some labels
95
```

Command Window
```
 -24.932760
 0.204406
 0.199616
For a student with scores 45 and 85, we predict an admission p
fx >>
```

Workspace

| Name | Value | Min |
|---|---|---|
| cost | 0.2035 | 0.. |
| data | 100x3 ... | 0 |
| grad | [-0.100... | -.. |
| initial_theta | [0;0;0] | 0 |
| m | 100 | 1.. |

Current Folder — E: ▸ Opt_ML_XIE ▸ MATLAB_codes ▸ Logistic-Regression-master

- costFunction.m
- Data.txt
- Main.m
- plotData.m
- plotData1.m
- plotDecisionBoundary.m
- predict.m
- README.md
- sigmoid.m