

University of Liverpool
Department of Computer Science
Autumn 2022

Maths and Stats for AI and Data Science
COMP533
Video presentation (Basic Math Concepts) 10/10

This assignment provides an opportunity to present one of the mathematical concepts studied in COMP533 module. You are asked to prepare a short 5 minute video presentation about one of the math concepts of your choice.

The task

You are asked to prepare a **5 minute** long video. The presentation should provide a short intro to the problem(s), the basic concept(s) and possible applications. Your work will be assessed according to the following criteria:

- | | |
|---|-------------|
| (1) Storyline | (40 points) |
| a. Introduction (e.g., historical background, context) | 10 pts |
| b. Basic concepts/meaning (of the topic) | 10 pts |
| c. Small example | 10 pts |
| d. Applications | 10 pts |
| (2) Clarity of the presentation | (40 points) |
| a. Good focus | 10 pts |
| b. Clarity of the argument (including correctness) | 10 pts |
| c. Clear slides (visual effect) | 10 pts |
| d. Clear recording (voice and smooth video) | 10 pts |
| (3) Extra effort | (20 points) |
| - This may mean extra information with respect to the story line, improved quality of presentation (e.g., use of animation), or any other extra contribution you think may improve your submission. | |

There is no **recommended platform**. Feel free to use the recording platform (e.g., MS Teams) of your choice which generates a standard video format (e.g., Youtube) with a direct access to the video file via provided hyperlink.

The **submission** is done via Canvas. Please submit the second page of this document in which you insert your name, provide a hyperlink (**in text format**) to your presentation, and tick boxes in the check list.

In the submission page you will also find a consent statement. If you tick the relevant box you agree to share your video with other students in this and future cohorts in COMP533. The intention is to create a repository with the video presentations which will help all students to familiarize themselves with the presented mathematical topics. **Important** Please do not feel obliged to give your consent and your choice will not affect your grade for this assignment.

Please make sure that the page with the requested information is submitted via CANVAS by

23:59 pm on Friday December 16th, 2022.

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Maths and Stats for AI and Data Science
COMP533

Video presentation (Basic Math Concepts)
Submission Page

Your name

-

SANTHOSH ARUNAGIRI

Hyperlink to the presentation

https://theuniversityofliverpool-my.sharepoint.com/personal/sgsaruna_liverpool_ac_uk/_layouts/15/stream.aspx?id=%2Fpersonal%2Fsgsaruna%5Fliverpool%5Fac%5Fuk%2FDocuments%2FRecordings%2FMeeting%20with%20Arunagiri%2C%20Santhosh%2D20221215%5F232246%2DMeeting%20Recording%2Emp4&ga=1

Check list (of what is going to be assessed, and the deadline)

- | | |
|--|-------------------------------------|
| (1) Storyline | |
| a. Introduction (e.g., historical background, context) | <input checked="" type="checkbox"/> |
| b. Basic concepts/meaning (of the topic) | <input checked="" type="checkbox"/> |
| c. Small example | <input checked="" type="checkbox"/> |
| d. Applications | <input checked="" type="checkbox"/> |
| (2) Clarity of the presentation | |
| a. Good focus | <input checked="" type="checkbox"/> |
| b. Clarity of the argument (including correctness) | <input checked="" type="checkbox"/> |
| c. Clear slides (visual effect) | <input checked="" type="checkbox"/> |
| d. Clear recording (voice and smooth video) | <input checked="" type="checkbox"/> |
| (3) Extra effort | <input checked="" type="checkbox"/> |
| (4) Submission deadline (Friday December 16, 2022) | <input checked="" type="checkbox"/> |

The consent

I agree to share my video with other students in this and other cohorts of COMP533 ☒

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Appendix

The list of selected (but not exclusive) 24 math themes covered by COMP533

- 1** Sets, Venn diagrams, infinite sets, Cartesian product,
- 2** Functions, domains, range, properties of functions,
- 3** Linear, quadratic, polynomial, rational, exponential, logarithmic functions - graphing functions,
- 4** Angles, basic properties and trigonometric functions,
- 5** Limits of sequences, rules, sandwich theorem,
- 6** Limits of functions, rules, sandwich theorem,
- 7** Continuity, intermediate value theorem,
- 8** Slope formula and tangent line, interpretation,
- 9** Derivatives, rules of derivation,
- 10** Monotonicity, local minima/maxima, first derivative test,
- 11** Higher order derivatives, shapes of curves (convex, concave), second derivative test,
- 12** Basic properties of vectors, scalars, interpretations,
- 13** Systems of linear equations, unique, multiple and no solutions,
- 14** Matrices, transposition, sum, dot product, product (different sizes),
- 15** Identity matrix, permutation matrix, embedded matrices and computing the inverse,
- 16** Systems of linear equations vs matrices, zero solutions, REF and reduced REF forms,
- 17** Groups, vector spaces, linear independence,
- 18** Bases, ranks, and linear mappings,
- 19** Intuition and basic properties of probability, random variable, independent events,
- 20** Conditional probability, Bayes theorem, with examples,
- 21** Expected value, variance and standard deviation, definition and interpretation,
- 22** Continuous probabilistic distributions, definitions and examples,
- 23** Discrete probabilistic distributions, definitions and examples,
- 24** Multivariate random variables, central limit theorem