**Linear Algebra**

**Q1**. Define Point/Vector (2-D, 3-D, n-D)?  
**A1**. <https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2830/introduction-to-vectors2-d-3-d-n-d-row-vector-and-column-vector/2/module-2-data-science-exploratory-data-analysis-and-data-visualization>  
  
**Q2**. How to calculate Dot product and angle between 2 vectors?  
**A2**. <https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2831/dot-product-and-angle-between-2-vectors/2/module-2-data-science-exploratory-data-analysis-and-data-visualization>  
  
**Q3**. Define Projection, unit vector?  
**A3**. <https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2832/projection-and-unit-vector/2/module-2-data-science-exploratory-data-analysis-and-data-visualization>  
  
**Q4**. Equation of a line (2-D), plane(3-D) and hyperplane (n-D)?  
**A4**. <https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2833/equation-of-a-line-2-d-plane3-d-and-hyperplane-n-d-plane-passing-through-origin-normal-to-a-plane/2/module-2-data-science-exploratory-data-analysis-and-data-visualization>  
  
**Q5**. Distance of a point from a plane/hyperplane, half-spaces?  
**A5**. <https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2834/distance-of-a-point-from-a-planehyperplane-half-spaces/2/module-2-data-science-exploratory-data-analysis-and-data-visualization>  
  
**Q6**. Equation of a circle (2-D), sphere (3-D) and hypersphere (n-D)?  
**A6**. <https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2835/equation-of-a-circle-2-d-sphere-3-d-and-hypersphere-n-d/2/module-2-data-science-exploratory-data-analysis-and-data-visualization>  
  
**Q7**. Equation of an ellipse (2-D), ellipsoid (3-D) and hyperellipsoid (n-D)?  
**A7**. <https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2836/equation-of-an-ellipse-2-d-ellipsoid-3-d-and-hyperellipsoid-n-d/2/module-2-data-science-exploratory-data-analysis-and-data-visualization>  
  
**Q8**. Square, Rectangle, Hyper-cube and Hyper-cuboid?  
**A8**. <https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2837/square-rectangle/2/module-2-data-science-exploratory-data-analysis-and-data-visualization>  
  
**Q9**. Check these videos 3b1b LA: <https://www.youtube.com/watch?v=fNk_zzaMoSs&list=PLZHQObOWTQDPD3MizzM2xVFitgF8hE_ab>

**Q10**. Check these videos 3b1b Calculus: <https://www.youtube.com/watch?v=WUvTyaaNkzM&list=PLZHQObOWTQDMsr9K-rj53DwVRMYO3t5Yr>  
  
**Q11**. Check these videos 3b1b calculus: <https://www.youtube.com/watch?v=p_di4Zn4wz4&list=PLZHQObOWTQDNPOjrT6KVlfJuKtYTftqH6>

**Probability and Statistics**

1. What is PDF?(https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2842/gaussiannormal-distribution-and-its-pdfprobability-density-function/2/module-2-data-science-exploratory-data-analysis-and-data-visualization)
3. What is CDF?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2843/cdfcumulative-distribution-function-of-gaussiannormal-distribution/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
5. explain about 1-std-dev, 2-std-dev, 3-std-dev range?
7. What is Symmetric distribution, Skewness and Kurtosis?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2844/symmetric-distribution-skewness-and-kurtosis/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
9. How to do Standard normal variate (z) and standardization?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2845/standard-normal-variate-z-and-standardization/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
11. What is Kernel density estimation?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2846/kernel-density-estimation/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
13. Importance of Sampling distribution & Central Limit theoremhttps://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2847/sampling-distribution-central-limit-theorem/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
15. Importance of Q-Q Plot: Is a given random variable Gaussian distributed?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2848/q-q-plothow-to-test-if-a-random-variable-is-normally-distributed-or-not/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
17. What is Uniform Distribution and random number generatorshttps://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2850/how-to-randomly-sample-data-points-uniform-distribution/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
19. What Discrete and Continuous Uniform distributions?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2849/discrete-and-continuous-uniform-distributions/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
20. How to randomly sample data points?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2850/how-to-randomly-sample-data-points-uniform-distribution/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
22. Explain about Bernoulli and Binomial distribution?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2851/bernoulli-and-binomial-distribution/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
24. What is Log-normal  and power law distribution?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2852/log-normal-distribution/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
26. What is Power-law & Pareto distributions: PDF, exampleshttps://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2853/power-law-distribution/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
28. Explain about Box-Cox/Power transform?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2854/box-cox-transform/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
30. What is Co-variance?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2855/co-variance/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
32. Importance of Pearson Correlation Coefficient?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2856/pearson-correlation-coefficient/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
34. Importance Spearman Rank Correlation Coefficient?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2857/spearman-rank-correlation-coefficient/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
36. Correlation vs Causation?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2858/correlation-vs-causation/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
38. What is Confidence Intervals?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2859/confidence-interval-ci-introduction/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
40. Confidence Interval vs Point estimate?
41. Explain about Hypothesis testing?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2863/hypothesis-testing-methodology-null-hypothesis-p-value/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
43. Define Hypothesis Testing methodology, Null-hypothesis, test-statistic, p-value?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2863/hypothesis-testing-methodology-null-hypothesis-p-value/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
45. How to do K-S Test for similarity of two distributions?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2865/k-s-test-for-similarity-of-two-distributions/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
46. What is a random variable?
47. What are the conditions for a function to be a probability mass function?(http://www.statisticshowto.com/probability-mass-function-pmf/)
48. What are the conditions for a function to be a probability density function ?(Covered in our videos)
49. What is conditional probability?
50. State the Chain rule of conditional probabilities?(https://en.wikipedia.org/wiki/Chain\_rule\_(probability))
51. What are the conditions for independence and conditional independence of two random variables?(https://math.stackexchange.com/questions/22407/independence-and-conditional-independence-between-random-variables)
52. What are expectation, variance and covariance?(Covered in our videos)
53. Compare covariance and independence?(https://stats.stackexchange.com/questions/12842/covariance-and-independence)
54. What is the covariance for a vector of random variables?(https://math.stackexchange.com/questions/2697376/find-the-covariance-matrix-of-a-vector-of-random-variables)
55. What is a Bernoulli distribution?
56. What is a normal distribution?
57. What is the central limit theorem?
58. Write the formula for Bayes rule?
59. If two random variables are related in a deterministic way, how are the PDFs related?
60. What is Kullback-Leibler (KL) divergence?
61. Can KL divergence be used as a distance measure?
62. What is Bayes’ Theorem? How is it useful in a machine learning context?
63. Why is “Naive” Bayes naive?
64. What’s a Fourier transform?
65. What is the difference between covariance and correlation?
66. Is it possible capture the correlation between continuous and categorical variable? If yes, how?
67. What is the Box-Cox transformation used for?
68. What does P-value signify about the statistical data?
69. A test has a true positive rate of 100% and false positive rate of 5%. There is a population with a 1/1000 rate of having the condition the test identifies. Considering a positive test, what is the probability of having that condition?
70. How you can make data normal using Box-Cox transformation?
71. Explain about the box cox transformation in regression models.
72. What is the difference between skewed and uniform distribution?
73. What do you understand by Hypothesis in the content of Machine Learning?
74. How will you find the correlation between a categorical variable and a continuous variable ?
75. How to sample from a Normal Distribution with known mean and variance?

**Dimensionality reduction**

1. What is dimensionality reduction? https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2878/what-is-dimensionality-reduction/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
3. Explain Principal Component Analysis?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2889/geometric-intuition-of-pca/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
5. Importance of PCA?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2888/why-learn-pca/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
7. Limitations of PCA?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2894/limitations-of-pca/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
9. What is t-SNE?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2898/what-is-t-sne/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
11. What is Crowding problem?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2901/crowding-problem/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
13. How to apply t-SNE and interpret its output?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2902/how-to-apply-t-sne-and-interpret-its-output/2/module-2-data-science-exploratory-data-analysis-and-data-visualization
14. ou are given a train data set having 1000 columns and 1 million rows. The data set is based on a classification problem. Your manager has asked you to reduce the dimension of this data so that model computation time can be reduced. Your machine has memory constraints. What would you do? (You are free to make practical assumptions.)(https://www.analyticsvidhya.com/blog/2016/09/40-interview-questions-asked-at-startups-in-machine-learning-data-science/)
15. Is rotation necessary in PCA? If yes, Why? https://google-interview-hacks.blogspot.com/2017/04/is-rotation-necessary-in-pca-if-yes-why.html
16. You are given a data set. The data set contains many variables, some of which are highly correlated and you know about it. Your manager has asked you to run PCA. Would you remove correlated variables first? Why?(<https://www.linkedin.com/pulse/questions-machine-learning-statistics-can-you-answer-saraswat/>)

**KNN**

1. Explain about K-Nearest Neighbors?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2927/k-nearest-neighbours-geometric-intuition-with-a-toy-example/3/module-3-foundations-of-natural-language-processing-and-machine-learning
3. Failure cases of KNN?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2928/failure-cases-of-knn/3/module-3-foundations-of-natural-language-processing-and-machine-learning
5. Define Distance measures: Euclidean(L2) , Manhattan(L1), Minkowski,  Hamminghttps://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2929/distance-measures-euclideanl2-manhattanl1-minkowski-hamming/3/module-3-foundations-of-natural-language-processing-and-machine-learning
7. What is Cosine Distance & Cosine Similarity?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2930/cosine-distance-cosine-similarity/3/module-3-foundations-of-natural-language-processing-and-machine-learning
9. How to measure the effectiveness of k-NN?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2931/how-to-measure-the-effectiveness-of-k-nn/3/module-3-foundations-of-natural-language-processing-and-machine-learning
10. Limitations of KNN?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2933/knn-limitations/3/module-3-foundations-of-natural-language-processing-and-machine-learning
12. How to handle Overfitting and Underfitting in KNN?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2935/overfitting-and-underfitting/3/module-3-foundations-of-natural-language-processing-and-machine-learning
14. Need for Cross validation?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2936/need-for-cross-validation/3/module-3-foundations-of-natural-language-processing-and-machine-learning
16. What is K-fold cross validation?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2937/k-fold-cross-validation/3/module-3-foundations-of-natural-language-processing-and-machine-learning
18. What is Time based splitting?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2940/time-based-splitting/3/module-3-foundations-of-natural-language-processing-and-machine-learning
20. Explain k-NN for regression?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2941/k-nn-for-regression/3/module-3-foundations-of-natural-language-processing-and-machine-learning
22. Weighted k-NN ?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2942/weighted-k-nn/3/module-3-foundations-of-natural-language-processing-and-machine-learning
24. How to build a kd-tree.?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2945/how-to-build-a-kd-tree/3/module-3-foundations-of-natural-language-processing-and-machine-learning
26. Find nearest neighbors using kd-treehttps://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2946/find-nearest-neighbours-using-kd-tree/3/module-3-foundations-of-natural-language-processing-and-machine-learning
28. What is Locality sensitive Hashing (LSH)?(
29. Hashing vs LSH?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2949/hashing-vs-lsh/3/module-3-foundations-of-natural-language-processing-and-machine-learning
31. LSH for cosine similarity?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2950/lsh-for-cosine-similarity/3/module-3-foundations-of-natural-language-processing-and-machine-learning
33. LSH for euclidean distance?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2951/lsh-for-euclidean-distance/3/module-3-foundations-of-natural-language-processing-and-machine-learning
34. In k-means or kNN, we use euclidean distance to calculate the distance between nearest neighbours. Why not manhattan distance ?(https://www.analyticsvidhya.com/blog/2017/09/30-questions-test-k-nearest-neighbors-algorithm/)
35. How to test and know whether or not we have overfitting problem?(https://www.appliedaicourse.com/course/applied-ai-course-online/lessons/how-to-determine-overfitting-and-underfitting/)
36. How is kNN different from k-means clustering?(https://stats.stackexchange.com/questions/56500/what-are-the-main-differences-between-k-means-and-k-nearest-neighbours)
37. Can you explain the difference between a Test Set and a Validation Set?(https://stackoverflow.com/questions/2976452/whats-is-the-difference-between-train-validation-and-test-set-in-neural-netwo)
38. How can you avoid overfitting in KNN?(https://www.appliedaicourse.com/course/applied-ai-course-online/lessons/how-to-determine-overfitting-and-underfitting/)

**External Resources:** 1.<https://www.analyticsvidhya.com/blog/2017/09/30-questions-test-k-nearest-neighbors-algorithm/>

1. What is Imbalanced and  balanced dataset.  
   https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2958/imbalanced-vs-balanced-dataset/3/module-3-foundations-of-natural-language-processing-and-machine-learning
2. Define Multi-class classification?  
   https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2959/multi-class-classification/3/module-3-foundations-of-natural-language-processing-and-machine-learning
3. Explain Impact of Outliers?  
   https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2962/impact-of-outliers/3/module-3-foundations-of-natural-language-processing-and-machine-learning
4. What is Local Outlier Factor?  
   https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2963/local-outlier-factor-simple-solution-mean-distance-to-knn/3/module-3-foundations-of-natural-language-processing-and-machine-learning
5. What is k-distance (A), N(A)  
   https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2964/k-distance/3/module-3-foundations-of-natural-language-processing-and-machine-learning
6. Define reachability-distance(A, B)?  
   https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2965/reachability-distanceab/3/module-3-foundations-of-natural-language-processing-and-machine-learning
7. What is Local-reachability-density(A)?  
   https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2966/local-reachability-densitya/3/module-3-foundations-of-natural-language-processing-and-machine-learning
8. Define LOF(A)?  
   https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2967/local-outlier-factora/3/module-3-foundations-of-natural-language-processing-and-machine-learning
9. Impact of Scale & Column standardization?  
   https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2968/impact-of-scale-column-standardization/3/module-3-foundations-of-natural-language-processing-and-machine-learning
10. What is Interpretability?  
    https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2969/interpretability/3/module-3-foundations-of-natural-language-processing-and-machine-learning
11. Handling categorical and numerical features?  
    https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2971/handling-categorical-and-numerical-features/3/module-3-foundations-of-natural-language-processing-and-machine-learning
12. Handling missing values by imputation?  
    https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2977/handling-missing-values-by-imputation/3/module-3-foundations-of-natural-language-processing-and-machine-learning
13. Bias-Variance tradeoff?  
    https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2973/bias-variance-tradeoff/3/module-3-foundations-of-natural-language-processing-and-machine-learning

**Navie bayes**

1. Bayes Theorem problem: https://youtu.be/LadMzl8MaXM
2. More Bayes Theorem problems: https://www.math.upenn.edu/~mmerling/math107%20docs/practice%20on%20Bayes%20solutions.pdf http://gtribello.github.io/mathNET/bayes-theorem-problems.html http://wwwf.imperial.ac.uk/~ayoung/m2s1/WorkedExamples1.pdf
3. What is Conditional probability? https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2989/conditional-probability/3/module-3-foundations-of-natural-language-processing-and-machine-learnin
4. Define Independent vs Mutually exclusive events?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2990/independent-vs-mutually-exclusive-events/3/module-3-foundations-of-natural-language-processing-and-machine-learning
5. Explain Bayes Theorem with example? https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2991/bayes-theorem-with-examples/3/module-3-foundations-of-natural-language-processing-and-machine-learning
6. How to apply Naive Bayes on Text data? https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2995/naive-bayes-on-text-data/3/module-3-foundations-of-natural-language-processing-and-machine-learning
7. What is Laplace/Additive Smoothing? https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2996/laplaceadditive-smoothing/3/module-3-foundations-of-natural-language-processing-and-machine-learning
8. Explain Log-probabilities for numerical stability? https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2997/log-probabilities-for-numerical-stability/3/module-3-foundations-of-natural-language-processing-and-machine-learning
9. In Naive bayes how to handle  Bias and Variance tradeoff? https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/2998/bias-and-variance-tradeoff/3/module-3-foundations-of-natural-language-processing-and-machine-learning
10. What Imbalanced data? https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/3000/imbalanced-data/3/module-3-foundations-of-natural-language-processing-and-machine-learning
11. What is Outliers and how to handle outliers? https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/3001/outliers/3/module-3-foundations-of-natural-language-processing-and-machine-learning
12. How to handle Missing values? https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/3002/missing-values/3/module-3-foundations-of-natural-language-processing-and-machine-learning
13. How to Handling Numerical features (Gaussian NB) https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/3003/handling-numerical-features-gaussian-nb/3/module-3-foundations-of-natural-language-processing-and-machine-learning
14. Define Multiclass classification.? https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/3004/multiclass-classification/3/module-3-foundations-of-natural-language-processing-and-machine-learning

**Optimization Problem**

1. Explain about Logistic regression?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/3011/geometric-intuition-of-logistic-regression/3/module-3-foundations-of-natural-language-processing-and-machine-learning
3. What is Sigmoid function & Squashing ?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/3012/sigmoid-function-squashing/3/module-3-foundations-of-natural-language-processing-and-machine-learning
5. Explain about Optimization problem in logistic regression. https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/3013/mathematical-formulation-of-objective-function/3/module-3-foundations-of-natural-language-processing-and-machine-learning
7. Expalain Importance of Weight vector in logistic regression.https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/3014/weight-vector/3/module-3-foundations-of-natural-language-processing-and-machine-learning
9. L2 Regularization: Overfitting and Underfittinghttps://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/3015/l2-regularization-overfitting-and-underfitting/3/module-3-foundations-of-natural-language-processing-and-machine-learning
11. L1 regularization and sparsity. https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/3016/l1-regularization-and-sparsity/3/module-3-foundations-of-natural-language-processing-and-machine-learning
13. What is Probabilistic Interpretation: Gaussian Naive Bayes ?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/3017/probabilistic-interpretation-gaussian-naive-bayes/3/module-3-foundations-of-natural-language-processing-and-machine-learning
14. Explain about Hyperparameter search: Grid Search and Random Search ?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/3019/hyperparameters-and-random-search/3/module-3-foundations-of-natural-language-processing-and-machine-learning
16. What is Column Standardization.?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/3020/column-standardization/3/module-3-foundations-of-natural-language-processing-and-machine-learning
18. Explain about Collinearity of features?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/3022/collinearity-of-features/3/module-3-foundations-of-natural-language-processing-and-machine-learning
20. Find Train & Run time space and time complexity of Logistic regression?https://www.appliedaicourse.com/lecture/11/applied-machine-learning-online-course/3023/testrun-time-space-and-time-complexity/3/module-3-foundations-of-natural-language-processing-and-machine-learning

**Linear Regression**

1. Outliers and Loss Functions: https://youtu.be/jiOBCCZCtug  
2. After analyzing the model, your manager has informed us that your regression model is suffering from multicollinearity. How would you check if he’s true? Without losing any information, can you still build a better model?(https://google-interview-hacks.blogspot.in/2017/04/after-analyzing-model-your-manager-has.html)  
3. What are the basic assumptions to be made for linear regression?(https://www.appliedaicourse.com/course/applied-ai-course-online/lessons/geometric-intuition-1-2-copy-8/)  
4. What is the difference between stochastic gradient descent (SGD) and gradient descent (GD)?(https://stats.stackexchange.com/questions/317675/gradient-descent-gd-vs-stochastic-gradient-descent-sgd)

5. When would you use GD over SDG, and vice-versa?(https://elitedatascience.com/machine-learning-interview-questions-answers)

6. How do you decide whether your linear regression model fits the data?(https://www.researchgate.net/post/What\_statistical\_test\_is\_required\_to\_assess\_goodness\_of\_fit\_of\_a\_linear\_or\_nonlinear\_regression\_equation)

7. Is it possible to perform logistic regression with Microsoft Excel?(https://www.youtube.com/watch?v=EKRjDurXau0)

8. When will you use classification over regression?(https://www.quora.com/When-will-you-use-classification-over-regression)

9. Why isn't Logistic Regression called Logistic Classification?(Refer :https://stats.stackexchange.com/questions/127042/why-isnt-logistic-regression-called-logistic-classification/127044)  
**More  External Resources:**  
1.<https://www.analyticsvidhya.com/blog/2017/08/skilltest-logistic-regression/>  
2.<https://www.listendata.com/2017/03/predictive-modeling-interview-questions.html>  
3.<https://www.analyticsvidhya.com/blog/2017/07/30-questions-to-test-a-data-scientist-on-linear-regression/> 4.<https://www.analyticsvidhya.com/blog/2016/12/45-questions-to-test-a-data-scientist-on-regression-skill-test-regression-solution/>  
[5. https://www.listendata.com/2018/03/regression-analysis.html](https://www.listendata.com/2018/03/regression-analysis.html)

SVM

1. Give some situations where you will use an SVM over a RandomForest Machine Learning algorithm and vice-versa.(https://datascience.stackexchange.com/questions/6838/when-to-use-random-forest-over-svm-and-vice-versa)
2. What is convex hull ?(https://en.wikipedia.org/wiki/Convex\_hull)
3. What is a large margin classifier?
4. Why SVM is an example of a large margin classifier?
5. SVM being a large margin classifier, is it influenced by outliers? (Yes, if C is large, otherwise not)
6. What is the role of C in SVM?
7. In SVM, what is the angle between the decision boundary and theta?
8. What is the mathematical intuition of a large margin classifier?
9. What is a kernel in SVM? Why do we use kernels in SVM?
10. What is a similarity function in SVM? Why it is named so?
11. How are the landmarks initially chosen in an SVM? How many and where?
12. Can we apply the kernel trick to logistic regression? Why is it not used in practice then?
13. What is the difference between logistic regression and SVM without a kernel? (Only in implementation – one is much more efficient and has good optimization packages)
14. How does the SVM parameter C affect the bias/variance trade off? (Remember C = 1/lambda; lambda increases means variance decreases)
15. How does the SVM kernel parameter sigma^2 affect the bias/variance trade off?
16. Can any similarity function be used for SVM? (No, have to satisfy Mercer’s theorem)
17. Logistic regression vs. SVMs: When to use which one? ( Let's say n and m are the number of features and training samples respectively. If n is large relative to m use log. Reg. or SVM with linear kernel, If n is small and m is intermediate, SVM with Gaussian kernel, If n is small and m is massive, Create or add more features then use log. Reg. or SVM without a kernel)
18. What is the difference between supervised and unsupervised machine learning?

**External Resources:** 1.<https://www.analyticsvidhya.com/blog/2017/10/svm-skilltest/>

DT

1. You are working on a time series data set. You manager has asked you to build a high accuracy model. You start with the decision tree algorithm, since you know it works fairly well on all kinds of data. Later, you tried a time series regression model and got higher accuracy than decision tree model. Can this happen? Why?(Refer :https://www.analyticsvidhya.com/blog/2016/09/40-interview-questions-asked-at-startups-in-machine-learning-data-science/)
2. Running a binary classification tree algorithm is the easy part. Do you know how does a tree splitting takes place i.e. how does the tree decide which variable to split at the root node and succeeding nodes?(Refer:https://www.analyticsvidhya.com/blog/2016/09/40-interview-questions-asked-at-startups-in-machine-learning-data-science/)

  External Resources: 1.[https://vitalflux.com/decision-tree-algorithm-concepts-interview-question](https://vitalflux.com/decision-tree-algorithm-concepts-interview-questions-set-1/)