Overview of the models we need to use for our group project:

| **Concept** | **Metrics** | **Pros** | **Cons** |
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| Linear Model | R-squared, Mean Squared Error (MSE) | - Simple interpretation  - Easy to implement  - Fast training and prediction | - Assumes linear relationship  - Limited in capturing complex patterns |
| Generalized Linear Model (Poisson) | Deviance, Akaike Information Criterion (AIC) | - Suitable for count data  - Handles overdispersion | - Assumes data follows Poisson distribution  - Sensitive to outliers |
| Generalized Linear Model (Binomial) | Log-likelihood, Area Under ROC Curve (AUC) | - Suitable for binary outcomes  - Can model probabilities | - Assumes data follows binomial distribution  - May not handle imbalanced data well |
| Generalized Additive Model | Deviance explained, Generalized Cross-Validation (GCV) | - Flexible in capturing non-linear relationships  - Handles interactions well | - May overfit with large number of parameters  - Computationally intensive |
| Neural Network | Accuracy, Loss function (e.g., Cross-entropy) | - Can learn complex patterns  - Suitable for high-dimensional data | - Requires large amounts of data  - Prone to overfitting  - Black box nature |
| Support Vector Machine | Accuracy, Margin | - Effective in high-dimensional spaces  - Works well with small datasets  - Versatile (supports different kernels) | - Memory-intensive for large datasets  - Not suitable for very large datasets  - Interpretability can be challenging |
| Optimization Problem | Objective function value, Convergence rate | - Can find optimal solutions  - Widely applicable across domains | - Requires careful selection of algorithms  - May get stuck in local optima |
| Cross-validation | Accuracy, Mean Squared Error (MSE) | - Estimates model performance on unseen data  - Helps detect overfitting | - Can be computationally expensive  - May lead to variance in performance estimates |

| **Concept** | **Visualisation** |
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| Linear Model | Linear Regression, Clearly Explained!!! - YouTube |
| Generalized Linear Model (Poisson) | Plotting Poisson regression | R |
| Generalized Linear Model (Binomial) | Getting Started with Negative Binomial Regression Modeling | UVA Library |
| Generalized Additive Model | Workshop 8: Generalized additive models |
| Neural Network | Machine Learning for Beginners: An Introduction to Neural Networks -  victorzhou.com |
| Support Vector Machine | What is a Support Vector Machine? - Datatron |
| Optimization Problem | Calculus I - More Optimization Problems |
| Cross-validation | 3.1. Cross-validation: evaluating estimator performance — scikit-learn  1.4.1 documentation |