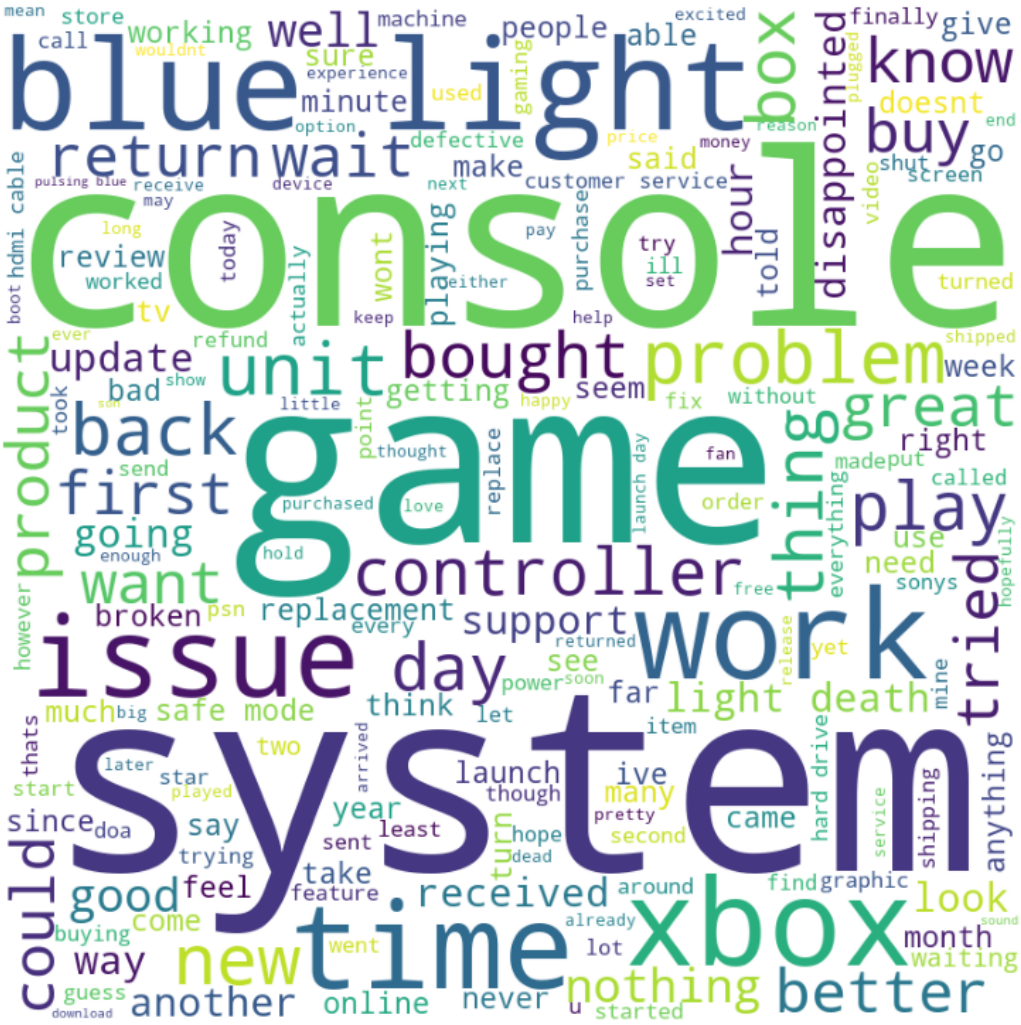
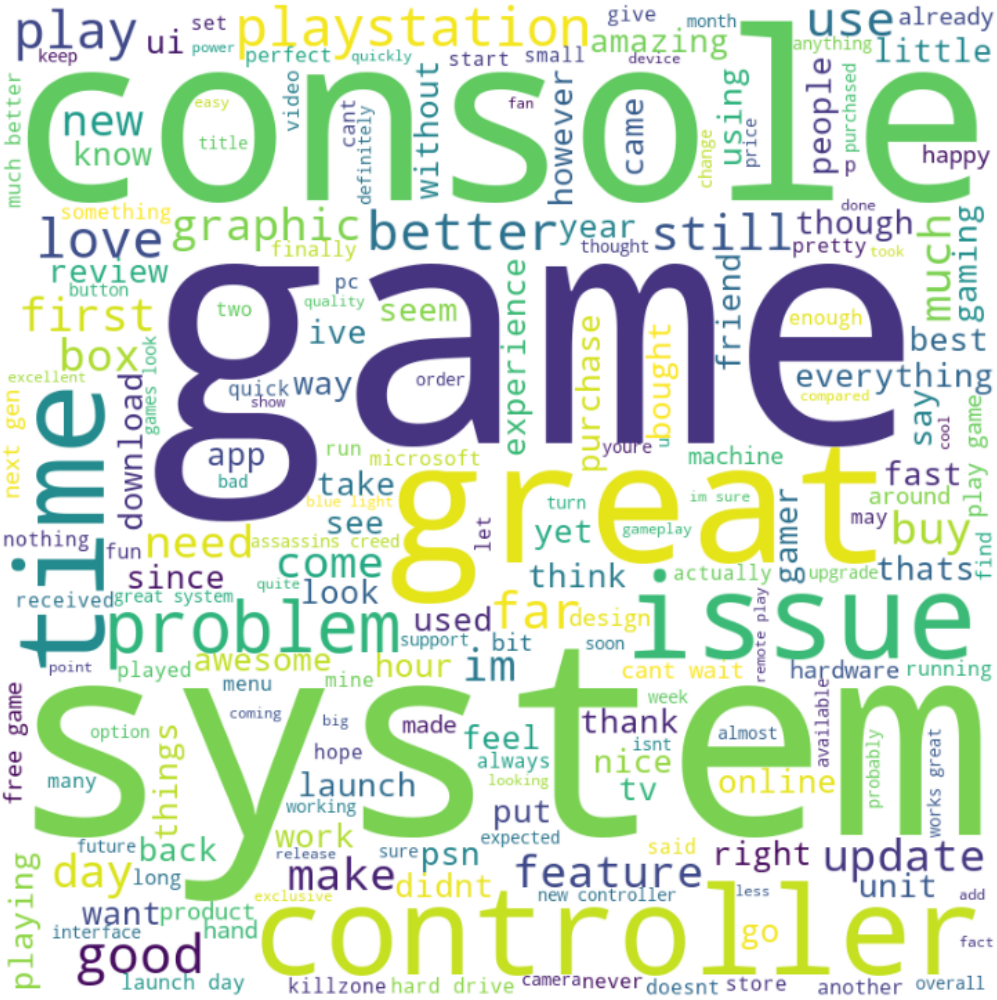


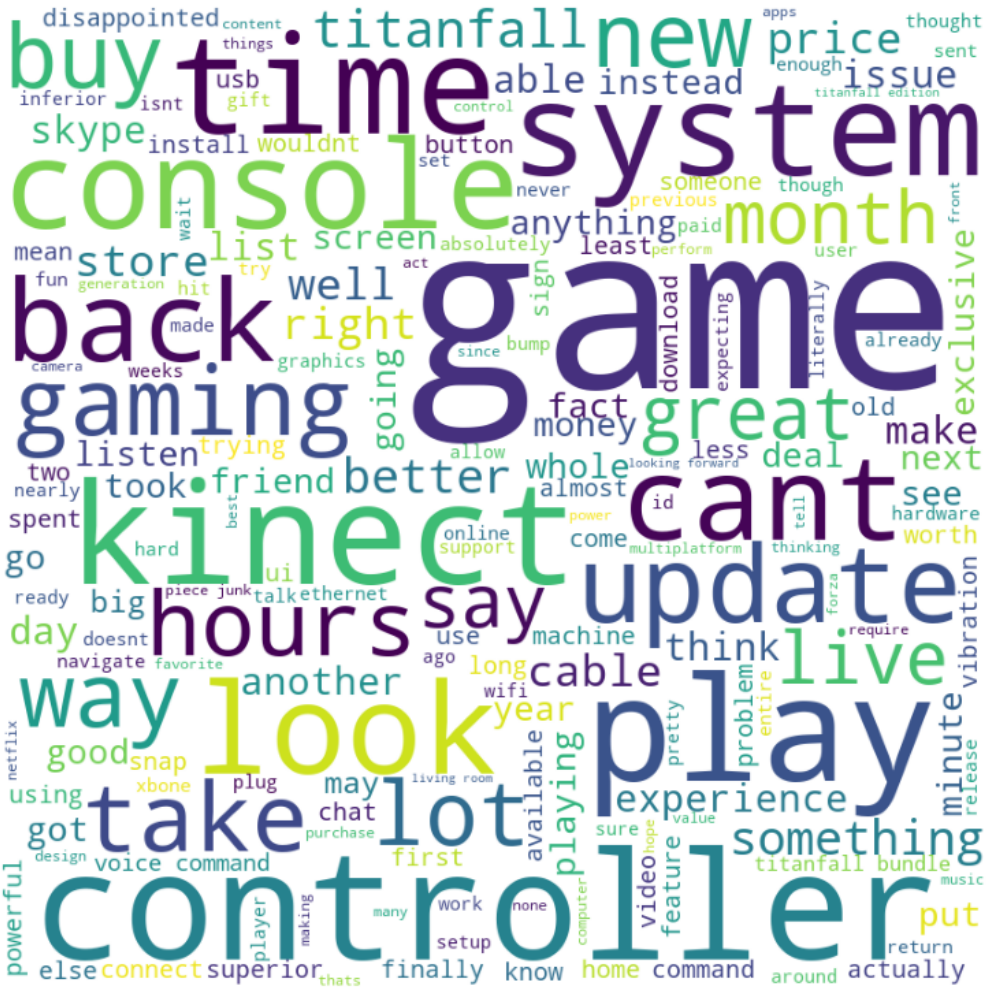
Word Cloud of Playstation from Negative reviews

- Some of the most frequent keywords from negative reviews include: system, time, blue light, return, wait, safe mode, customer service, replacement, price, light death, etc.
- From these frequent keywords, a few areas that needs attention or ideas to reduce negative reviews include:
    - Improve the operating system to reduce wait time when using the console
    - Reduce operating crashing issues such as "blue light of death"
    - Improve customer service on certain areas such as part replacement
    - Reduce pricing



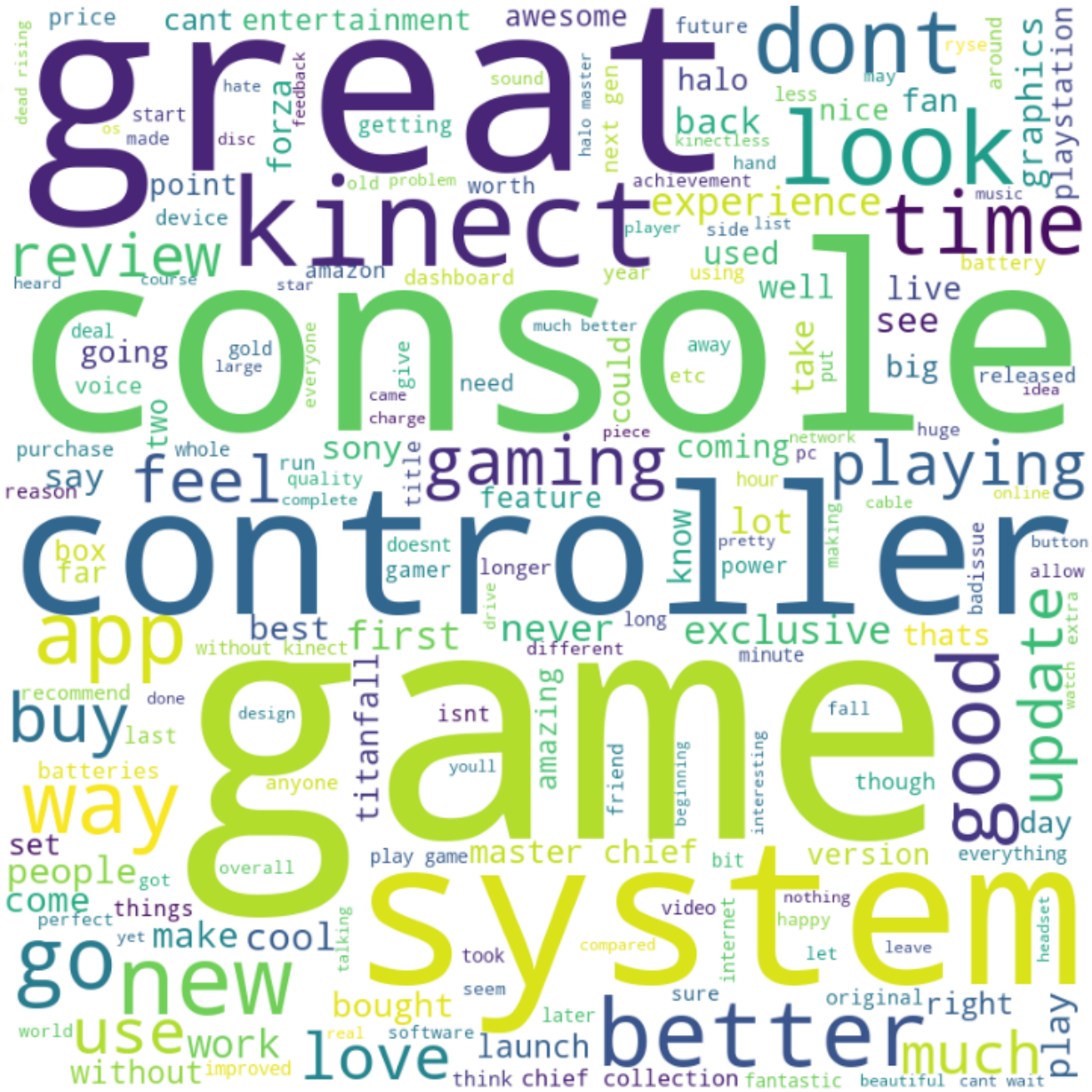
Word Cloud of Playstation from Positive reviews

- Some of the most frequent keywords from negative reviews include: console, game, system, graphic, friend, experience, fast, design, free game, hardware, interface, etc.
- From these frequent keywords, some strengths that should be developed further to increase positive reviews include:
    - Continue to develop console quality
    - Continue to develop new games or onboard new game developers
    - Graphic quality is a strength.
    - The design of the console is also what people like.
    - Continue to offer free games to players
    - Generally, people like the console's software interface/UI.



Xbox One Negative

- Some of the most frequent keywords from negative reviews include: look, time, system, titanfall, price, kinect, update, vibration, controller, etc.
- From these frequent keywords, some strengths that should be developed further to increase positive reviews include:
    - Improve operating system to decrease wait time
    - Many reviews mention the issue with a popular game - TitanFall. The company could work with the game developers to help fix the bugs/issues with the games.
    - Look into reducing the price point (e.g via discount, sales event, etc.)
    - The controllers might not be optimized due to issues with vibration.



Xbox One Positive

- Some of the most frequent keywords from negative reviews include: console, entertainment, kinect, controller, game, halo, chief collection, quality, etc.
- From these frequent keywords, a few areas that needs attention or ideas to reduce negative reviews include:
    - The console-quality seems to be liked by the reviewers.
    - Some reviewers also mention a popular game: Halo - Chief Collection.
    - The controller is also well-liked in positive reviews.

Playstation Reviews

Test accuracy: 0.806
Precision: 0.800
Recall: 0.997
F1 Score: 0.887

Xbox Reviews

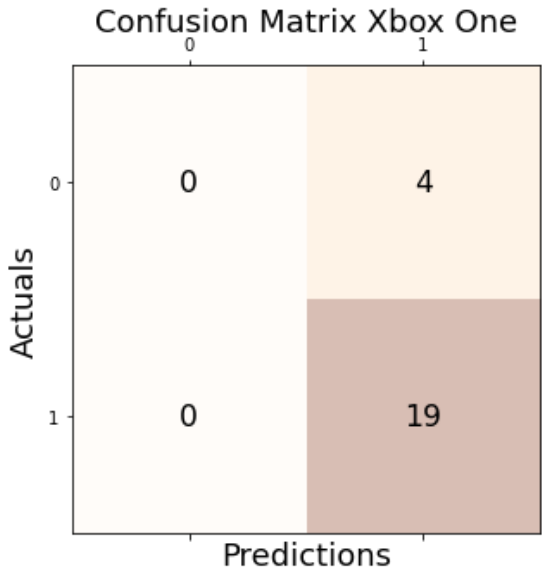
Test accuracy: 0.826
Precision: 0.826
Recall: 1.000
F1 Score: 0.905

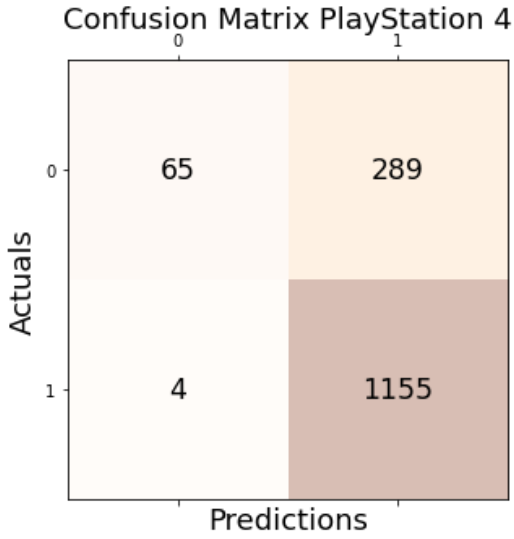
Accuracy score represents the ratio of correctly predicted observations to the total observation ((TP+TN)/Total). For Playstation, accuracy = 0.806 meaning the model correctly predicts 80.6% of the data. For Xbox, accuracy = 0.826 meaning the model correctly predicts 82.6% of the data.

Precision score represents the ratio of correctly predicted positive observations to the total predicted positive observations (TP/(TP+FP)). In other words, from all the reviews predicted to be positive, how many of them are actually positive. For Playstation, precision score = 0.8 while for Xbox, precision = 0.826

Recall represents the ratio of correctly predicted positive observations to all observations that are actually positive (TP/(TP+FN)). In other words, from all the reviews that are positive, how many did we predict?. Recall for Playstation = 0.997 while recalls for Recall for Xbox = 1 which is quite high. However, it's also important to note that for Xbox, since the model predicts 100% to be positive, it obviously means recall = 1.

F1 score is the weighted average of Precision and Recall. (F1 Score = 2*(Recall * Precision) / (Recall + Precision)). F1 score is useful in this case since the distribution of negative and positive observations are not evenly distributed (approx 75% positive and 25% negative for both products). F1 score for Playstation = 0.887 while F1 score for Xbox = 0.905





According to the Xbox confusion matrix: the model predicts all testing observations (23) to be positive while in reality, 19 (82.6%) are correctly predicted (TP) and 4 (17.4%) are wrongly predicted (FP).

According to the Playstation confusion matrix: the model made predictions on a total of 1513 observations, within which:

- 1155 (76.34%) are predicted as positive that are actual positive (TP)
- 65 (0.04%) are predicted as negative that are actual negative (TN)
- 289 (19.1%) are predicted as positive but are actual negative (FP)
- 4 (0.003%) are predicted as negative but are actual positive (FN)

It's important to note that even though the Accuracy, Precision, Recall and F1-score of Playstation are generally a bit lower than those of Xbox, Playstation received far more reviews than Xbox (approx 1500 reviews for Playstation compared to approx 110 reviews for Xbox), the model trained by reviews from Playstation might be better performing due to exposure to more training data.

Additionally, due to the limited number of reviews from Xbox One, the model predicted 100% testing data as positive. This means the classifier model for Xbox One is not functional, even though the scores (accuracy, precision, recall, F1) are better.

Last but not least, perhaps bag of words approach is not the most intelligent method of natural language processing