

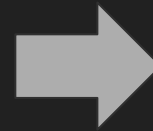
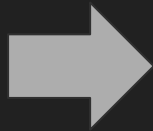
# THE GAMEXPLORER

Bringing your inner gamer out, this quarantine

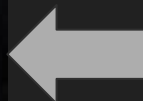


PRESS START

ADITYA GUDAL



The Problem: Reliving my gaming days during quarantine, but in moderation.



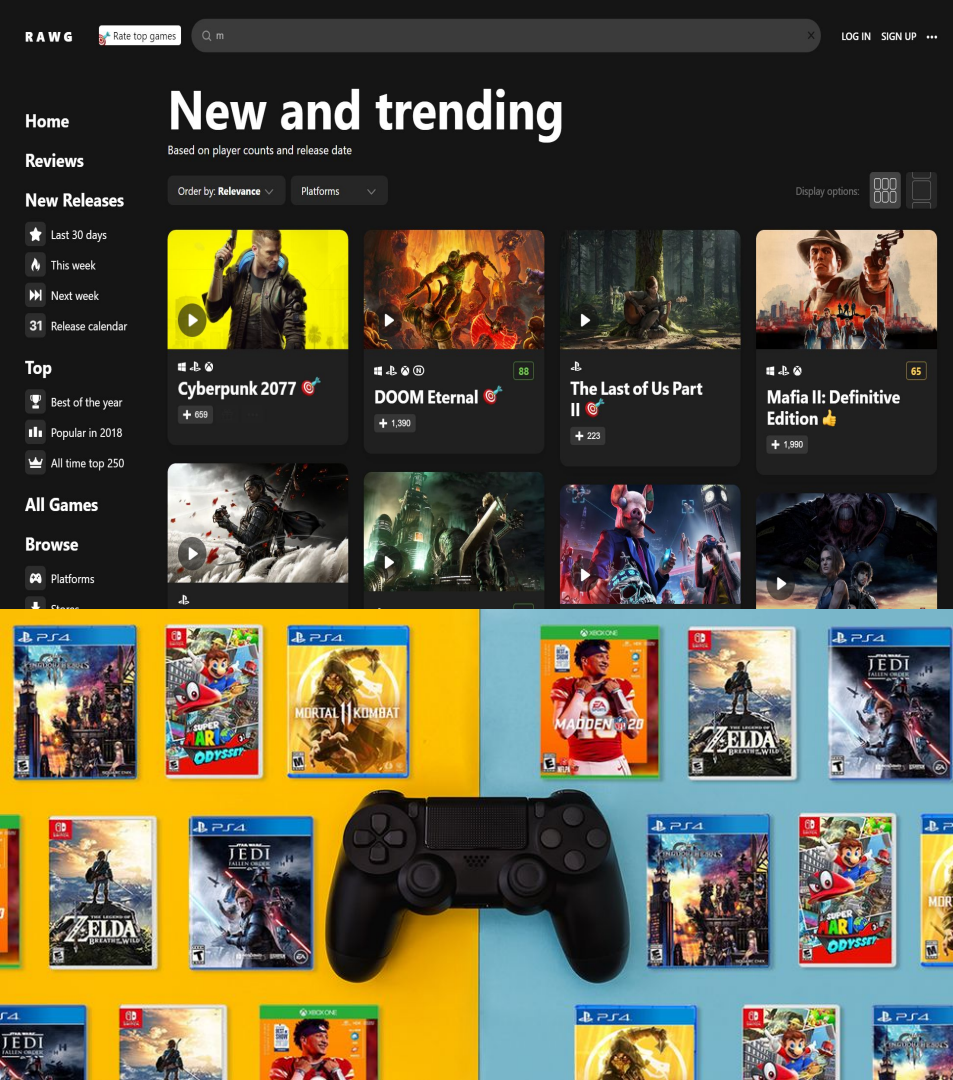
A promotional image for the PC demo of Grand Theft Auto V. It features the character Trevor Philips in the center, wearing a white t-shirt and holding a wooden baseball bat. He has a serious, menacing expression. The background shows a white truck with a bullet hole and a blue bridge structure under a clear sky. The game's title and version are on the left, and the platform and demo status are on the right.

**grand  
theft  
auto** 

**PC**

**DEMO**





# Data

- RAWG database - ~350,000 video games over 50 platforms.
- API docs link: <https://rawg.io/apidocs>
- API fetches 3240 games with their characteristics like playtime, user score, rating, genres, review counts, suggestion counts etc.
- The RDS instance stores the model's 10 recommendations and the user's favorite game

# Model and Success

## 1. Models:

- K-nearest neighbors - not bad
- K-means clustering - not bad
- Alternating Least Squares - better

Best Hyperparameters: 25 latent factors, 0.1 shrinkage, 100 iterations

## 2. Success Criteria:

- Machine Learning: Root Mean Square Error < 0.4
- Business: Atleast 50,000 User sessions and positive feedback count > 3000.

## 3. Results:

- Root Mean square error - 0.49
- Mean absolute error - 0.44

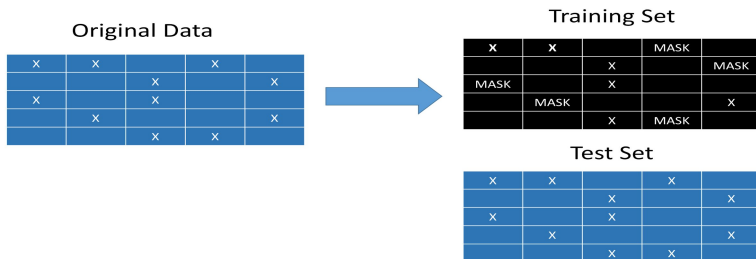
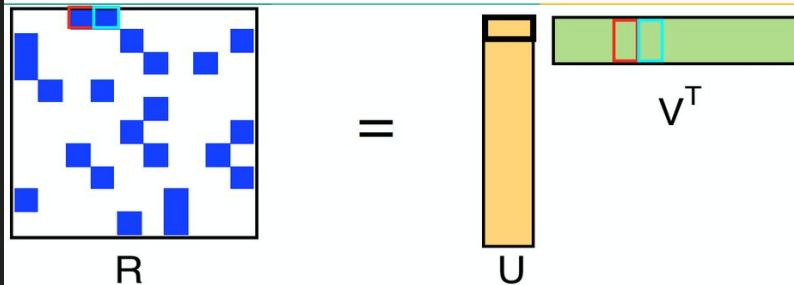
ALS <https://blog.insightdatascience.com/explicit-matrix-factorization-als-sgd-and-all-that-jazz-b00e4d9b21ea>  
Data Split [https://nbviewer.jupyter.org/github/jmsteinw/Notebooks/blob/master/RecEngine\\_NB.ipynb](https://nbviewer.jupyter.org/github/jmsteinw/Notebooks/blob/master/RecEngine_NB.ipynb)

## Matrix factorization - ALS

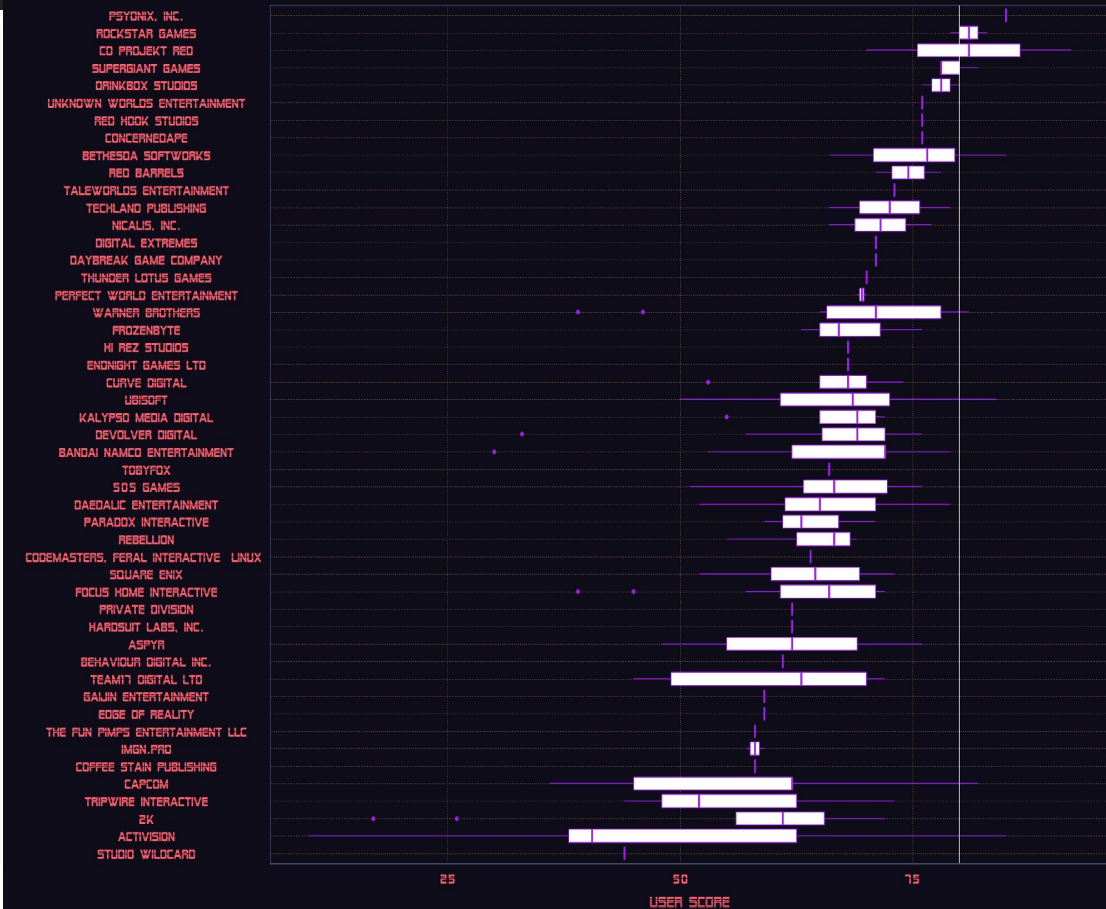
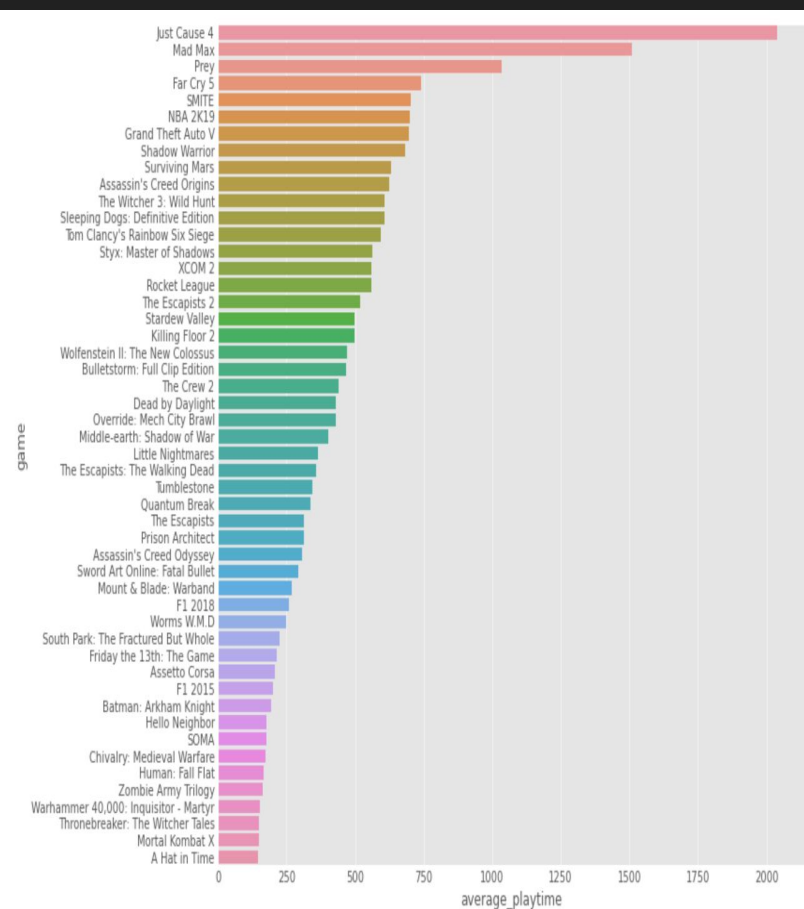
- Fix P and optimize Q
- Convex problem when one of the latent matrices is fixed
- Easy to parallelize

**Losses:**  $\forall p_i : L(p_i) = \|R_i - P_i \times Q^T\|_2 + \lambda \cdot \|p_i\|_2$   
 $\forall q_j : L(q_j) = \|R_i - P \times Q_j^T\|_2 + \lambda \cdot \|q_j\|_2$

**Solutions:**  $p_i = (Q^T \times Q + \lambda I)^{-1} \times Q^T \times R_i$   
 $q_j = (P^T \times P + \lambda I)^{-1} \times P^T \times R_j$



# Interesting Insights



# GAME OVER

THANK YOU FOR PLAYING /



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