🎮 GameRx: Your Digital Dose

Relief Through Play
Can video games be prescribed like mood medicine?

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1. The Challenge

The Problem

Many people use video games to cope with stress, anxiety, frustration, burnout, or emotional overload. Yet most game discovery systems are built around popularity, ratings, or genre labels, not emotional impact.

What players already say about how games make them feel exists inside review text, but it's unstructured and difficult to analyze at scale. As a result, people rely on anecdotes or trial-and-error when looking for games that actually help them feel better.

The Goal

Use player-written reviews and machine learning to identify emotional patterns in games, then explore whether games can be recommended based on **emotional relief needs**, not popularity or genre alone.

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2. Data Sources

Steam Reviews Dataset

- **Source:** Kaggle
- **Dataset:** AndrewMVD Steam Reviews
- **Scale:** Millions of player-written reviews
- **Used for:**
    - Emotion detection using NLP (NRCLex)
    - Review-level emotion scoring
    - Emotion aggregation and analysis
    - Clustering emotional patterns

Reviews are the emotional foundation of the project. They capture how players describe their experiences in their own words.

Steam Game Metadata

- **Source:** Kaggle
- **Dataset:** Steam Games Dataset
- **Used for:**
    - Genre normalization and parsing
    - Game-level aggregation
    - Hybrid relief modeling
    - Interpretation and visualization

Metadata provides the structural context needed to interpret emotional signals found in reviews.

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3. Data Cleaning & Preparation

Both datasets went through multiple inspection and cleaning steps:

- Removed null and invalid rows
- Deduplicated games and reviews
- Corrected shifted or misaligned metadata columns (AppID, Name, release info)
- Normalized game titles and genres
- Cleaned review text for NLP processing

New structured features were created, including:

- review_text_clean
- genre_list
- primary_genre
- genre_count

Reviews were merged with metadata using **AppID**, producing datasets that support both review-level and game-level analysis.

Tools used:
Python, pandas, NumPy, Jupyter Notebook

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4. Exploratory Analysis & Emotion Detection

Emotion detection was performed using the **NRC Emotion Lexicon (NRCLex)**.

From review text, the following features were generated:

- Emotion scores (joy, anger, sadness, trust, fear, etc.)
- Primary emotion per review
- Emotion intensity
- Emotion richness

Scores were normalized by review length (per 100 words) to allow fair comparisons across games and genres.

Early exploratory analysis validated that emotional signals varied meaningfully across genres and game types.

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5. Modeling Approach

Clustering (Unsupervised Learning)

- Reviews and games were clustered using **KMeans**
- Multiple values of *k* were tested
- **k = 5** provided the best balance of structure and interpretability
- Clusters were interpreted using emotion profiles and relief pathways, not just numeric distance

This revealed consistent emotional “play styles” that cut across traditional genre labels.

Hybrid Relief Model

A hybrid emotional framework was built to ensure full dataset coverage.

Four emotional relief pathways were defined:

- **Comfort**
- **Catharsis**
- **Distraction**
- **Validation**

Relief pathways were assigned using:

- Bottom-up signals from review language (when available)
- Top-down genre and design context (as a fallback)

Correction logic was applied to address pathway drift, over-assignment, and edge cases. Safety and content blocking logic was added to ensure inappropriate content does not appear in recommendations.

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6. Visuals & What They Show

All visuals are generated directly from the cleaned and corrected datasets.

They include:

- Genre × emotion heatmaps
- Emotion distribution charts
- Relief pathway comparisons
- Joy-to-anger ratio visuals
- Cluster profile charts and heatmaps
- Treemaps showing how genres map to relief pathways

These visuals are used to validate modeling decisions and explain the system clearly in the case study and app.

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7. Key Insights & Takeaways

- Emotional patterns in games are not random and do not align cleanly with genre alone
- Simulation and casual games lean strongly toward **Comfort** and **Distraction**
- Action and rhythm-based games often support **Catharsis** and controlled release
- Narrative and reflective games frequently provide **Validation**
- Clustering revealed emotional play styles that span multiple genres

Together, these findings support the idea that **emotional relief is a better organizing principle than genre**.

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8. Human, Social, and Practical Impact

- **Players:** Can choose games that better match or support how they feel
- **Designers:** Gain insight into emotional engagement beyond mechanics
- **Wellness & product teams:** See a framework for mood-aware, ethical recommendation systems

GameRx demonstrates how behavioral data can be used to support emotional regulation rather than engagement alone.

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9. Final Outputs & Links

- **GitHub Repository:**
  (link)
- **Portfolio Page:**
  (link)
- **Streamlit App:**
  (link or demo note)

10. Supporting Documentation

- Deliverables list (GameRx – Deliverables List)
- Data Sources Tracker
- Hybrid Model Notes
- Project Task Checklist

All documentation maps directly to the notebooks and datasets used in the project.