Online Education Framework with Customized Problems

Jayme Green (dxg4022@rit.edu) | Advisor: Sean Strout

Ever complete a test where you were forced to answer a multiple choice problem that was hard to answer, yet - given that same problem as another format - it would have been easy? This project tries to fix this problem by creating an online platform which gives users questions based on their preferences.

**Baseline**
- Platform picks random problem for the user
- Given to 25 friends and family
- **Evaluation:**
  - Google Forms Survey
  - Information in Database
- With random problems, users did not receive problem types they liked
- Averaged 19% difference between the bars

**Goal**

**Baseline**
- Not getting the problems they liked, users skipped problems often
- Averaged 3.18

**Customization Implementation**

1. **K-Means Clustering of Problems**
2. **K-NN Inspired Prediction Based on Similarity of Opinion With Other Users**

**K-Means Cluster of Problems**
- Problems naturally will be in clusters based on difficulty and type (multiple choice, dropdown, or chart)
- Give users highest rated problem from their favorite cluster

**User Opinion Similarity Prediction**
- As users complete problems they are required to give their user rating
- Users with similar opinions of problems will likely have similar of other problems
- Give users the problems based on previous users similar opinions (user rating and number of attempts) with the highest rating

**Results**

**Baseline**
- With customized problems, users received problems that they preferred
- Averaged 4% difference between the bars

**Baseline**
- Getting customized problems, users skipped less often
- Averaged 2.14

**Design**
- Utilizes C#, SQL, Amazon RDS, Visual Studio
- Note: No attributes are shown to save space