Technical Communication for Computer Scientists

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Progress Report: The Movie-Chain-Runner Project

Team Chain-Runner

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1 Overview

We first explain the context of this report and the Movie-Chain-Runner Problem.

1.1 This Report

This report documents our progress in solving the Movie-Chain-Runner Problem (discussed below) as of June 17, 2013, as well as our plans for how to proceed up until the project deadline of June 27, 2013.

1.2 The Movie-Chain-Runner Project

2 Progress

We present our progress in three sections: General Progress, Status, and Projections.

2.1 General Progress

Here we discuss the accomplishments of our project thus far.

Our first step was to reconstruct the list of movie titles as a directed graph, with an edge from title A to title B when B can follow A in a movie chain, reducing the problem to the well-known Longest Path Problem. We proceeded to implement a greedy brute force algorithm which simply followed as many paths as possible. This quickly constructed a path of 243 titles and then ceased to make appreciable progress. The majority of our efforts have since been towards honing and augmenting this brute force algorithm.

We have

2.2 Status

Here we evaluate the current state of our project and discuss our ability to meet deadlines set in our Proposal.

Our longest chain currently consists of ??? titles and ???? words. This falls short of our scheduled June 17 goal of 285 titles and ???? words by ? titles and ?? words.

Figure 1 on page ? shows the original Gantt chart presented in our project proposal. We have made ?????????????? changes.

2.3 Projections

Here we discuss our goals from now until the final project deadline (June 27, 2013) and how we intend to accomplish these goals.

Since 285 titles and ???? words is the threshold for receiving A on this project, the benefits of achieving 300 titles are primarily cosmetic. Thus, we have reduced our final goal to 285 titles.

We have propose 3 approaches to this goal

Although we have devoted much computational power toward extending the longest chain at either end, we have not considered a potentially large number of alternative paths

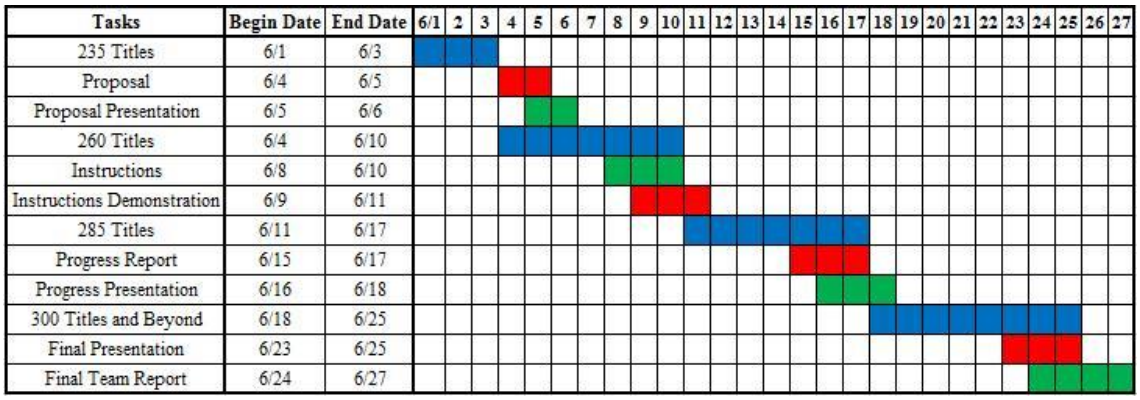

Figure 1: Our original Gantt chart.

between nodes in the chain. Thus, we will attempt to compute, for adjacent or nearby nodes, alternative (longer) chains connecting the same nodes. We are also considering ways to "trim" the graph by removing nodes unlikely to be in the longest chain, thus reducing the number of possible paths that must be considered.

If simple methods prove insufficient, we may also implement a color-coding algorithm proposed by Alon et al. [1] or one of several genetic algorithms proposed by Portugal et al., [2] although, due to the implementation complexity of these algorithms, we hope this will be unnecessary.

3 Recommendations

4 Discussion

Appendices

A Our Longest Movie Chain

Here, we include our current longest movie chain, with ??? titles and ???? words:

```
Die Another Day          Dead Poets' Society      Title 5
Day of the Dead          Title 4                  Title 6
```

[1] Noga Alon , Raphael Yuster , Uri Zwick, Color-coding, Journal of the ACM (JACM), v.42 n.4, p.844-856, July 1995. (accessed June 16, 2013 at `http://dl.acm.org/citation.cfm?id=210337`).

[2] D. Portugal, C. H. Antunes, R. Rocha, "A Study of Genetic Algorithms for Approximating the Longest Path in Generic Graphs," Proc. of the IEEE SMC, pp. 2539-2544, 2010. (accessed June 16, 2013 at `http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=5641920& navigation=1`).