Radio Song Scheduling System

0. Background Information

A classic rock radio station does its best to play a variety of songs from the 60s through the 90s. Their goals for their play lists are to (a) have little repetition, (b) play popular songs frequently and obscure or less popular songs infrequently, and (c) emphasize on songs from the 70s and 80s. The following requirements specify a system that schedules songs to realize these goals.

1. Record Library Holdings File

1.0 The song scheduling system will read an existing record library holdings file.

1.1 The library holdings file lists all the songs on every record held by the station.

1.2 The system will not write to the library holdings file.

1.3 The system will read the library holdings file at least once per week and add new library holdings to its scheduling records.

1.4. Library holdings file records are text files with one song record per line. Fields are separated by ASCII character 17 (Control-Q). Fields are of arbitrary length.

1.5 Each holdings file record contains the following fields, in order:

Song title

Song performer

Recording title (the empty field, if none)

Recording type (LP, Single, CD, etc.)

Year of publication

Record library access number (a positive integer)

2. Song Data

2.0 The song scheduling system will schedule songs based on their frequency of play and their popularity.

2.1 The system will record, for each song, data about song play frequency.

2.1.1 Song play frequency will be recorded as the number of plays per week, and the date the song was last played.

2.1.2 The initial song play frequency for a newly acquired song will be 0 plays per week, and last played never.

2.1.3 Song play frequency data will be updated from the play schedules the system itself produces.

2.2 The system will record, for each song, its popularity on a scale ranging to 100.

2.2.1 The default initial popularity of a song is 50.

2.2.2 Station personnel can alter a song's popularity rating at any time.

2.3 Every time the system makes a schedule, it will prioritize all songs in its database.

2.3.1 A song's priority is 10 times its popularity rating, minus 7 times its number of plays per week, minus 16 divided by the number of days since it was last played.

3. Schedules

3.0 A schedule consists of a list of songs, the hour of the day in which they are to be played, and their duration.

3.1 Day-long schedule may be produced for as many as seven consecutive days.

3.2 A schedule will program songs for between 43 and 48 minutes of each hour (to leave room for commercials and announcements).

4. Making and Altering Schedules

4.0 Station personnel (users) may generate schedules at any time.

4.1 Schedules are made by selecting songs at random from the highest priority songs at the time of scheduling, with no repetitions on any day.

4.2 Candidate schedules are displayed to the user before being finalized.

4.3 The user may delete songs from a schedule.

4.4 The user may insert songs in the schedule.

4.5 If alterations to the schedule cause the songs to be less than 43 minutes, or more than 48 minutes for some hour, the system alerts the user to this fact.

4.5.1 If the songs exceed 48 minutes for some hour, the user may delete songs.

4.5.2 If the songs exceed 48 minutes for some hour, the user may direct that the system delete songs.

4.5.2.1 The system deletes songs by removing them at random until the songs scheduled for each hour are between 43 and 48 minutes.

4.5.3 If the songs are less than 43 minutes for some hour, the user may insert songs.

4.5.4 If the songs are less than 43 minutes for some hour, the user may direct that the system insert songs.

4.6 Station personnel may finalize schedules.

4.6.1 The system will not allow a schedule with less than 43 or more than 48 minutes of songs in any hour to be finalized.

4.6.2 When a schedule is finalized, the play frequency for all songs in the schedule is updated.

5. Examining Schedules

5.0 Station personnel may print finalized schedules.

5.1 Station personnel may query the system for its data about any song.

5.1.1 Song queries contain the name of the song as their only parameter.

5.1.2 Song query results display the name of the song, its play frequency, and its popularity rating.