Monkey Music Challenge

Welcome to the Monkey Music Challenge.

Quick start

To install the challenge runtime:

```
gem install monkeymusic
```

To get started quickly:

```
monkeymusic demo
```

To see something on the screen:

```
monkeymusic -p demo_player
```

You can probably learn a lot about the game from reading the `demo_player`.

Also make sure to read the protocol examples at the end of the document.

The level

Your monkey moves around in a flat 2D level. You can think of the level as a matrix, where any square can be occupied by one thing at any given time.

```
Xl 1 U 2 lX t ll ll t ###t ########### t### #t # #T tlTlt T# # t# ## #T#l l#T# ## #l
######X X###### l# ## # # x # # ## #T# #t# #t# #T# #x#l##### # #####l#x# # # # l # #
# ### # # # # # # # ### #t # # # t# #l###l#t#t#t#t#l###l#
```

Every monkey is represented in the level by a numerical id:

- *Monkey*: `\d`

Besides monkeys, the level can also contain:

- *Tracks*: `spotify:track:.....................`
- *Walls*: `#`
- *The User*: `U`

Your monkey has one mission: to find and deliver suitable track recommendations to *The User*.

The user

To help you figure out what tracks to recommend to your *User*, you have access to the following of your user's toplists:

- *Top tracks*: `[(track,artist,album,year)]`
- *Top albums*: `[(album,artist,year)]`
- *Top artists*: `[(artist)]`

You also have a list of what the user does not like:

- *Top disliked artists*: `[(artist)]`

The monkey

A monkey can move between squares in the four cardinal directions:

- *North*: `N`
- *West*: `W`
- *East*: `E`
- *South*: `S`

Your monkey can carry a specific amount of tracks at any given time, this is referred to as the `capacity` of your monkey.

To stand next to a *Track* and move towards it is to pick it up, provided that the monkey has remaining `capacity`.

To stand next to a *User* and move towards it is to `deliver` all curretly carried tracks to the user. Your monkey will then score points according to how well the tracks fit the userâ€™s music taste.

After delivering tracks, your monkey will once again be at full `capacity`.

The scores

To decide how well a *Track* fits the music taste of a *User*, every track is put into one of 5 different score tiers.

2 of these tiers are negative tiers. You donâ€™t want your monkey picking up and delivering tracks from these tiers.

The following criteria decide which tier any given track belongs to:

Tier -2: Disliked artist

To recommend a track whose `artist` is among the userâ€™s *Top disliked artists* is simply an epic fail.

Tier -1: â€œSÃ¶nderlyssnadâ€

When the `track` is already among the userâ€™s *Top tracks*, there is not much point in recommending it, is there?

Tier += 1: Favorite artist

If the `artist` of the track is among the userâ€™s *Top artists*, the track will be bumped up one tier.

Tier += 1: Favorite album

If the `album` of the track is among the userâ€™s *Top albums*, the track will be bumped up one tier.

Tier += 1: Favorite decade

This is an interesting one. Every user has a *Top decade*, which is the decade that is most prominent among the userâ€™s *Top tracks* and *Top albums*.

If the `year` of the track belongs to the userâ€™s *Top decade*, the track will be bumped up one tier.

Tally

Your track will be scored according to it's tier:

- *Tier -2*: -16 points
- *Tier -1*: -4 points
- *Tier 1*: 4 points
- *Tier 2*: 16 points
- *Tier 3*: 64 points

Tier 3 tracks are obviously very valuable, so be on the lookout for these.

Once a *Track* is picked up, there is no way to get rid of it but to `deliver` it to the *User*, so make sure to stay away from negative tier tracks.

The game

Every game is broken up into a number of turns. Every `turn`, your program will be fed information about the current state of the level, by reading from `stdin`. Your program responds by printing one `command`, to `stdout`, telling your *Monkey* what to do during the current turn.

If there are more that one *Monkey* in the level, `fate` will decide which monkey gets to carry out its command first.

The game consists of two `phases`.

Init phase

During the `init` phase, your program will read information about the level that will be useful during the entire course of the game.

The information that can be read from `stdin` during the `init` phase is:

- The numerical `id` of your *Monkey*
- The `width` of the map
- The `height` of the map
- The `turn limit` of the game
- The `toplists` of the *User*.

Turn phase

After the `init` phase, a number of `turn` phases will follow.

The information that can be read from `stdin` during the `turn` phase is:

- The `turn number` (1 - `turn limit`)
- The current `capacity` of your monkey (`>= 0`)
- The `remaining time` your program can run before `penalty`.

That's right, your program will only be allowed to run for a certain amount of time during the course of the game. When your `remaining time` is depleted, your *Monkey* will fall asleep for 5 turns, after which your `remaining time` will be replenished.

The commands

Every `turn`, you can issue one `command` to your *Monkey*.

Movement commands

The following commands will result in your *Monkey* attempting to move in the specified direction. The move will succeed if the adjacent square is empty, or if the move results in the *Monkey* picking up a *Track* or deliverings tracks to the *User*.

- Move north: `N`
- Move west: `W`
- Move east: `E`
- Move south: `S`

Lookup command

Instead of moving, you can every round do a `lookup` to get `metadata` on a *Track*. You will need the metadata for a track to calculate which `tier` it belongs to.

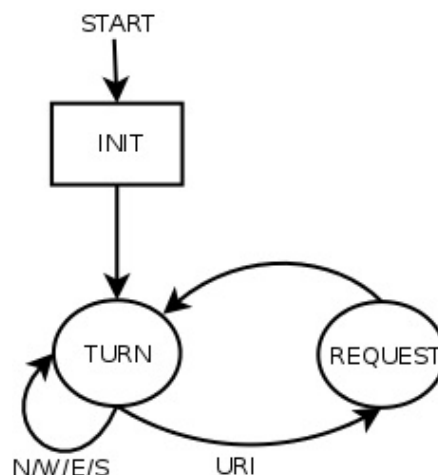To do a lookup, simply print the `uri` of the track to `stdout`.

- Lookup: `spotify:track:.....................`

Boost command

Once every game, you can issue one `boost` command, and then issue 3 other commands that will be carried out during that round.

The stdin protocol

Diagram

Init phase

``` INIT 9 // Monkey id 11 // Level width 11 // Level height 100 // Turn limit 10 // Number of top tracks Condemnation,Depeche Mode,Songs Of Faith And Devotion,1993 Enola Gay - 2003 - Remaster,Orchestral Manoeuvres In The Dark,Organisation,2003 The Fog Rose High,Craft Spells,Idle Labor,2011 Cars,Gary Numan,Premier Hits,1981 Tainted Love,Soft Cell,Tainted Love / Where Did Our Love Go,2009 You Surround Me,Erasure,Wild!,1989 Something New,Girls Aloud,Something New,2012 Guilty Partner,New Order,Technique [Collector's Edition],2008 The New Stone Age - 2003 Digital Remaster,Orchestral Manoeuvres In The Dark,Architecture And Morality,2003 Don't Go,Yazoo,Upstairs At Eric's,1982 10 // Number of top albums Delta Machine,Depeche Mode,2013 Architecture And Morality,Orchestral Manoeuvres In The Dark,2003 Replicas,Tubeway Army,1979 Vienna,Ultravox,2008 Hits The Very Best Of Erasure,Erasure,2003 Tainted Love / Where Did Our Love Go,Soft Cell,2009 The Best Of New Order,New Order,1994 Witching Hour,Ladytron,2007 Nightdrive With You,Anoraak,2008 Boxed,Eurythmics,2005 10 // Number of top artists Depeche Mode Orchestral Manoeuvres In The Dark The Human League New Order The Postal Service Kraftwerk Gary Numan MGMT M83 Duran Duran 5 // Number of disliked artists Misfits The Ramones Bad Religion The Clash Sex Pistols ```

Turn phase

``` TURN 1 // Turn number 3 // Remaining capacity 10000 // Remaining runtime (ms) _,_,_,_,_,_,_,_,_,_,_

```
_,W,W,_,_,_,_,_,W,W,_
,W,spotify:track:5H85hOp2oMlhMh9JlkdJP2,,_,_,_,_,spotify:track:3NYCaxkggl0Hh8vQptSUvV,W,_
_,_,_,_,_,_,_,spotify:track:3qAEEfC57Ol4SCuj7Zk5va,_,_,_ 9,_,_,_,_,_,_,_,_,_,_
_,_,_,spotify:track:4CARtDIJS87fOmWb1RxLKK,_,_,_,_,_,_,U _,_,_,_,_,_,_,_,_,_,_
_,_,_,_,_,_,spotify:track:1ARZpuJ5KjxvmsFU4NryQH,_,_,_
,W,spotify:track:0S8LgLoseDB6W2HWd1ym6P,,_,_,_,_,spotify:track:3NwaVr6RJg2LPBcJ1Ysl1O,W,_
_,W,W,_,_,_,_,_,W,W,_ _,_,_,_,_,_,_,_,_,_,_ ```
```

The stdout protocol

Movement

`W`

Lookup

The following is printed to `stdout`:

`spotify:track:0S8LgLoseDB6W2HWd1ym6P`

Then the following can be read from `stdin`:

`1 spotify:track:0S8LgLoseDB6W2HWd1ym6P,,Condemnation,,Depeche Mode,,Songs Of Faith And Devotion,,1993`

If the lookup failed:

`0`

Remember to flush the output buffers!

Boost

The letter `B` followed by a comma-separated lists of other commands:

`B,W,spotify:track:4CARtDIJS87fOmWb1RxLKK,spotify:track:0S8LgLoseDB6W2HWd1ym6P`

Then the monkey will move `west` and the following can be read from `stdin`:

`2 spotify:track:0S8LgLoseDB6W2HWd1ym6P,"Condemnation","Depeche Mode","Songs Of Faith And Devotion",1993 spotify:track:4CARtDIJS87fOmWb1RxLKK,The Fog Rose High,Craft Spells,Idle Labor,2011`