Caia Tutorial for the game of Entropy
Windows Distribution

In the Windows distribution you can find software to help you to develop the CodeCup 2023 game Entropy. The software is called Caia and it includes three computer players for testing purposes. You can also create your own players and use Caia to coordinate the games between various players.

For the latest information and updates, please see: www.codecup.org

Installation

Unzip the file *caia_entropy_windows.zip somewhere to your favourite place.*

After packing out will get this:

- In the folder *entropy/bin/*: *manager.txt, caiaio.exe, manager.exe, competition.exe, referee.exe, player1.exe, player2.exe, player3.exe, generator.exe, javawrapper.exe, jarwrapper.exe* and some content in de folder *entropy/bin/recources/*.
- In the folder *entropy/src/manager/: manager.cc*.
- In the folder *entropy/src/competition/: competition.cc*.
- In the folder *entropy/src/caiaio/: all the Windows software for the caiaio*. This is a new feature since 2021.[1]
- And three empty folders: *entropy/refereelogs, entropy/playerlogs* and *entropy/competitionlogs/*.

The software is now ready to use.

Playing a game

To play a game between player1 and player2, just execute from the command prompt in the *entropy/bin/* directory the following prompt:

```
caiaio
```

Once the game is finished you can find log files of the referee and players in the directories *entropy/refereelogs/* and *entropy/playerlogs/*. The referee produces an html file so that you can watch the game. Note that the playerlog file only contains information written by the player to its stderr. (The three example players only write an ID to their stderr).

It is also possible to see exactly what is happening between the manager, caiaio, the referee and the client players. To see this, start caiaio in debug mode:

```
caiaio -d
```

This option is useful if you let your own player print evaluation or runtime data about each move to its stderr so that you can debug more easily your player in case of failure.

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[1] Steven Kroon, one of the CodeCup contestants, adapted the Linux software for the caiaio so that it also works under Windows without using Cygwin. Due to this some unexpected problems may pop up.

The referee produces an html file that has a link to the javascript files in the folder *../bin/javascript/*. You can change this default link with another path. The only thing you have to do is to make a *referee.txt* in which you refer to the javascript files with the new path:

```
jspath=../newpath/
```

The manager

The source code of the manager is included in the distribution. You can change *manager.cc* according to your own wishes. For more information we refer you to the Caia documentation.

The information on what games will be played is stored in *entropy/bin/manager.txt*. To play two games, player1 against player2 and player2 against player1, you can change it to:

```
2
player1 player1.log player2 player2.log
player2 player2.log player1 player1.log
```

The competition manager

Now a competition manager is written for organizing your own competitions in a very simple way. The software is part of Caia and is using the caiaio in a similar way as the manager does in the distros. Now it is possible to test your own players easily and find out which one of them is strongest.

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Running a competition

To run a competition between several players just copy the players in the *bin/* folder. Make sure that there are no other files in the folder than necessary to run Caia. Each unknown file will be regarded as a client player! Only the files with the names *javascript.exe*, *caiaio.exe*, *manager.exe*, *referee.exe*, *competition.exe*, *generator.exe*, *javawrapper.exe, jarwrapper.exe, cygwin1.dll*, **.txt, *.class* and **.jar* will be discarded as such. Then execute from the command line in the *bin/* folder:

```
caiaio –m competition
```

Once the competition is finished you can find log files of the referee, the players and the competition in the directories *entropy/refereelogs/*, *entropy/playerlogs/* and *entropy/competitionlogs/*. The referee produces an html file so that you can watch the game. Note that the playerlog file only contains information written by the player to its stderr. The information about the played games for future competitions is stored in the *competitionlogs/* folder.

It is also possible to generate a log file with all game results in the *competitionlogs/* folder. The place and the name of the log file can be chosen freely. Example:

```
caiaio –m competition –f ../competitionlogs/logfile.txt
```

Running a new competition with a new player

All you have to do is to add a new player to the *bin/* folder and rerun the competition. Games that were played earlier will not be replayed. Mind that each time an existing player is modified, the games of this player will be replayed!

This is how our competition manager works

In general you can have different type of players: players that always do the same and the so-called random players. To get a good estimate of the strength of such a random player it is better to play 50 games and then to output the mean score by calculating the sum of the 50 scores divided by 50.

If you wish to let the competition manager work in another way, just change de source code in *caia/entropy/src/competition/competition.cc* and recompile.

Running competitions using competition.txt

For those of you who prefer to have more control over their competitions can make use of a text file. All you have to do is to put a text file *competiton.txt* in the *bin/* folder with the following content:

```
3
david2
marcel11
laurent3
```

In the example a full competition will be run among the client players *david2*, *marcel11* and *laurent3*. Other players in the *bin/* folder will not participate.

Working with Java classes and JAR files

In the distribution of the Windows tarball is the source code included for the javawrapper and the jarwrapper. These two programs let your Java player work with Caia.

If you have made a Java program *JavaPlayer.class*, you must do two things. The first thing you'll have to do is to put this file into the *bin/* folder. The second thing you'll have to do is to rename the program *javawrapper(.exe)* in the *bin/* folder into *JavaPlayer(.exe)*. Then it should work. More information is found in the header of *javawrapper.c*.

If you have made a JAR file *JavaPlayer.jar*, you must do two things. The first thing you'll have to do is to put this file into the *bin/* folder. The second thing you'll have to do is to rename the program *jarwrapper(.exe)* in the *bin/* folder into *JavaPlayer(.exe)*. Then it should work. More information is found in the header of *jarwrapper.c*.

Using your own coloured chips

If you do nothing, the referee will randomly make the coloured chips available for Chaos. If you want to use a self chosen sequence of 49 coloured chips it is possible to put a file *colour.txt* in the *bin/* folder. Example:

```
4
5
…
3
```

You can generate a *colour.txt* file by using *generator(.exe)*. The source can be found in the *src/generator/* folder.