GAME: Tutorial and Language Reference Manual

Team 13

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1.1 Introduction

GAME is designed to solve problems related to sports statistics as well as sports management. Today, decisions in the world of sports increasingly need to be backed by data and quantitative analysis, rather than stemming from purely qualitative assessments. This is important for athletes, coaches, and managers in improving their individual and team performance in addition to sports reporters seeking compelling data to back their stories. Thus, a lot of money and many careers are involved in the practice of data analytics in sports. Accessing, manipulating, updating, and analyzing data are essential in the pursuit of game-changing information – GAME allows users to accomplish this objective.

GAME is unique in that it is specifically geared towards the manipulation of sports statistics. Like R, it will provide various statistical measures for the purpose of data analysis and will allow users to define additional ones. More than that, it will provide built-in object-oriented functionality, including sports-specific classes such as Player and Team that will allow users to develop their programs quickly and easily. GAME provides automatic conversion from data provided in specified file types – JSON and XML – to an internal, object-oriented representation of the data. The same service will be provided in the reverse direction, so that data can be exported to such files. GAME will make it extremely simple to examine portions of a dataset that are most relevant to the user through efficient data retrieval. For example, the Timeline type will allow users to both examine and create a chronological record of sporting events, which can contain any details the user is interested in studying. Our language provides a unique combination of statistical tools; easy data access and manipulation; and sports-specific concepts in an object-oriented framework.

1.2 Getting Started

According to Kernighan and Ritchie, the “only way to learn a new programming language is by writing programs in it.” This introduction teaches the user to create programs, compile them, and run them successfully in GAME. The first program is the same for all languages:

Listing 1.1: First Program

```
Print the words
        hello, world
```

In GAME, the program to print “hello, world” is:

Listing 1.2: HelloWorld.GAME

```
#include stdlib.game

function main() {
        print("hello, world!")
}
```

A GAME program consists of functions and variables. A function contains statements that specify the computing operations to be done and variables store values used during computation. In the above example, main is the function. Functions can typically be named by the user, but main is different because the program is executed inside of it. main normally calls other functions – some written by the user and others by libraries already present in the system.

1.3 Variables and Arithmetic Expressions

1.4 The For Loop

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1.6 Functions

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1.8 Major Standard Library Methods/ Classes

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2 — Language Reference Manual

2.1 Lexical Conventions

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