

Fundamentals of Auditing Financial Reports

Chapter 1

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Auditing

An audit is an independent examination of the records of an organization to ascertain how far the financial statements as well as non-financial disclosures present a true and fair view of the concern. It also provides assurance that the systems of record keeping are well-controlled and accurate as required by law. Auditing has become such a ubiquitous phenomenon in the corporate and the public sector that academics started identifying an “Audit Society”.

R packages required for this book

The code in the chapters in this book requires R packages that are specified in the `library("package_name")` commands. These will be packages such as `tidyverse`, `ggplot2`, `lubridate` and `keras`. Keras is the API for the Tensorflow machine learning language, and requires a separate `keras` installation with `install_keras`; general notes on Tensorflow installation are provided below.

Package installation: There are two steps to using a package. First it must be *installed*, i.e., copied to a location on your computer where R can access it. Then it must be *loaded* into the working memory of R. To install, for example the `tidyverse` package, type `install.packages("tidyverse")` and then press the *Enter/Return* key. To load the previously installed package type `library(tidyverse)`. After these commands, the `tidyverse` package will now be available for use by your program code.

Tensorflow installation: Tensorflow is a machine learning package used in this book; commands to TensorFlow are called using the Keras API. Prior to using the tensorflow R package you need to install a version of TensorFlow on your system using the R `install_tensorflow()` function, which provides an easy to use wrapper for the various steps required to install TensorFlow. You can also choose to install TensorFlow manually (as described at <https://www.tensorflow.org/install/>).

TensorFlow for R is tested and supported on the following 64-bit systems:

1. Ubuntu 16.04 or later
2. Windows 7 or later
3. macOS 10.12.6 (Sierra) or later (no GPU support)

First, install the tensorflow R package from GitHub or the CRAN repository (search to find the site) then, use the `install_tensorflow()` function to install TensorFlow. Note that on Windows you need a working installation of Anaconda. `install_tensorflow()` is a wrapper around `reticulate::py_install`.

```
install.packages("tensorflow")
library(tensorflow)
install_tensorflow()
```

You can confirm that the installation succeeded with:

```
library(tensorflow)
tf$constant("Hello Tensorflow")
## tf.Tensor(b'Hello Tensorflow', shape=(), dtype=string)
```

This will provide you with a default installation of TensorFlow suitable for use with the tensorflow R package. There is much more to Tensorflow, and interested readers should review the materials at <https://tensorflow.rstudio.com/> and at <https://www.tensorflow.org/>