

# Development of web applications with R Shiny and Docker

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Software engineer applied to data solutions



# \$whoami

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# Overview

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- Applications using Shiny
- Docker
- Hands-on

# Web Applications using Shiny

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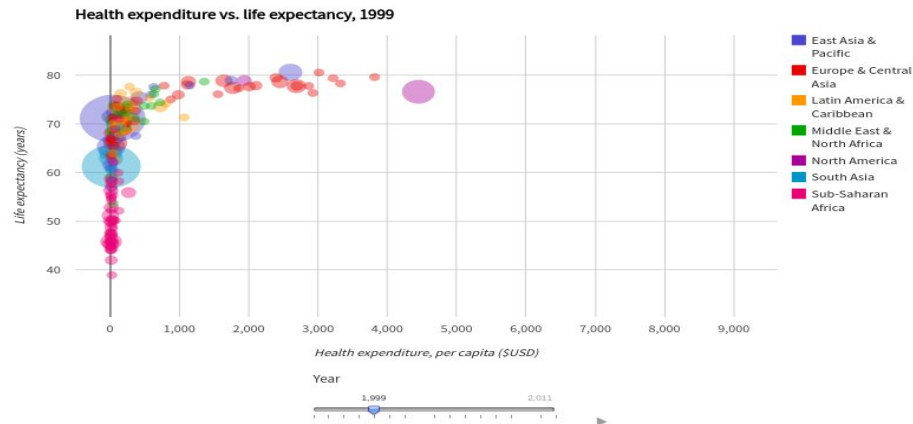
# What is Shiny?

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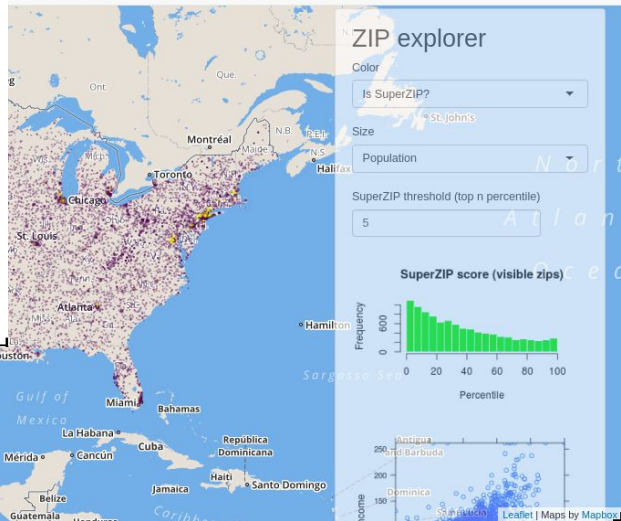
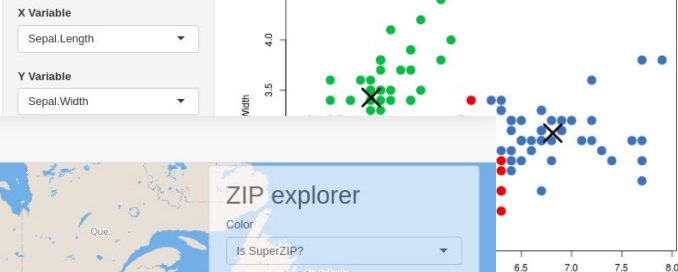
Shiny is an R package that makes it easy to build interactive web apps straight from R. You can host standalone apps on a webpage or embed them in R Markdown documents or build dashboards. You can also extend your Shiny apps with CSS themes, htmlwidgets, and JavaScript actions.

# Some examples

## Google Charts demo



## Iris k-means clustering

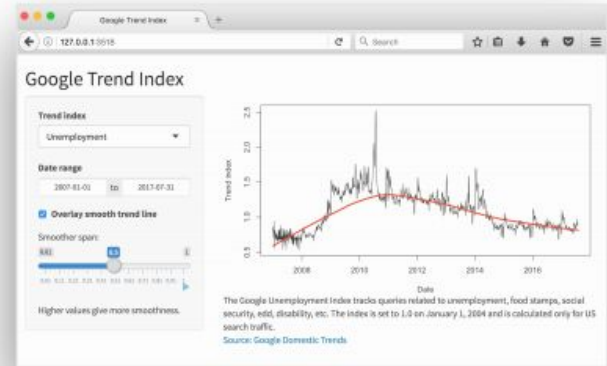


For more, see [Shiny gallery](#).

Every Shiny app has a webpage that the user visits, and behind this webpage there is a computer that serves this webpage by running R.

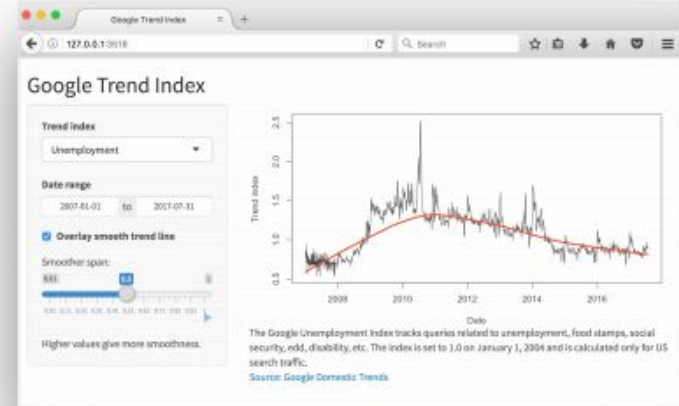
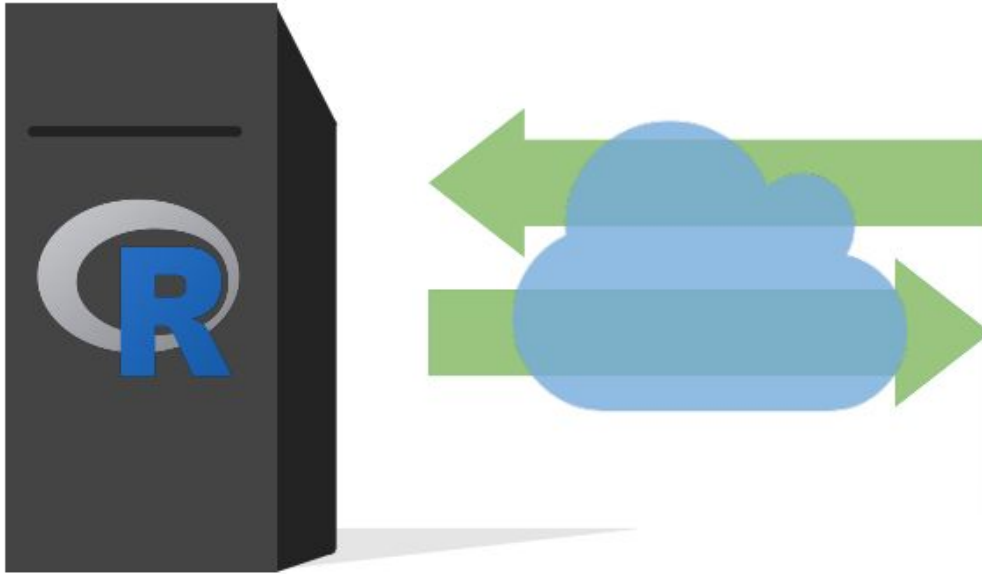


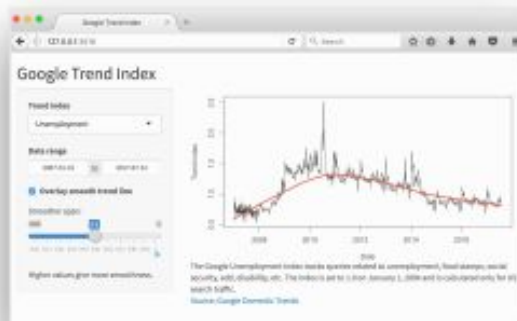
When running your app locally, the computer serving your app is your computer.





When your app is deployed, the computer serving your app is a web server.





Server instructions



User interface

# Anatomy of a Shiny app

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```
library(shiny)
ui <- fluidPage()
```

## **User interface**

controls the layout and appearance of app

```
server <- function(input, output) {}
```

## **Server function**

contains instructions needed to build app

```
shinyApp(ui = ui, server = server)
```

# Image Compression - PCA

Number of PC to be used in the compression:

2 64

1 8 15 22 29 36 43 50 57 64



# Code



# Sharing or deploying your app

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Some options:

- Shinyapps.io;
- Shiny server;
- Shiny server pro.



# Docker

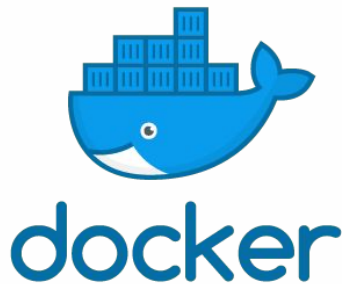




# What is Docker?

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Docker is a tool designed to make it easier to create, deploy, and run applications by using containers. In a way, Docker is a bit like a virtual machine. Docker seems a great way for us to deploy a Shiny application.



# What is a Docker container?

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A Docker container is a loosely isolated environment running within a host machine's kernel that allows us to run application-specific code.

# The Kernel

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- The kernel is the software at the core of an operating system, with complete control;
- The CPU is the core circuitry which executes program instructions;
- Docker runs on top of original machine's kernel - making it the *host machine*.

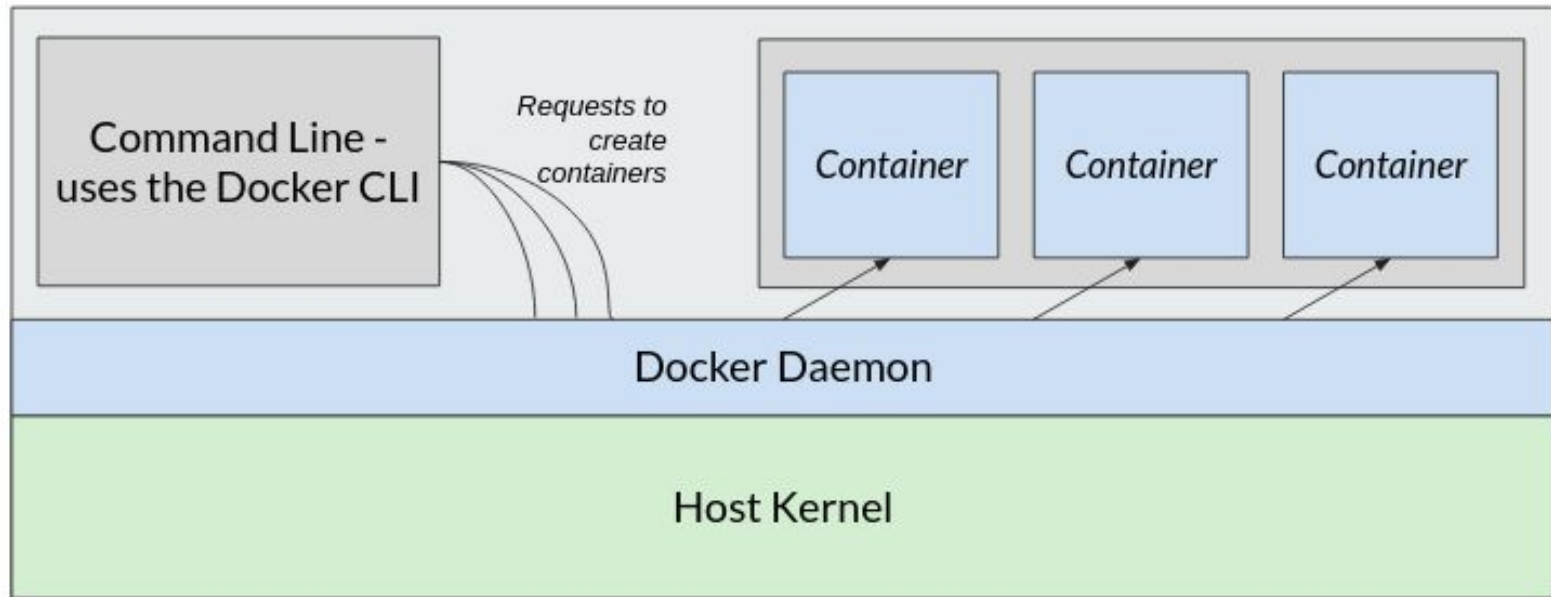
# The Docker Engine

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- Consists of the Docker server, an API, and command line interface.
- The server is also called the Docker daemon.
  - daemon - background processes on an operating system.
- Docker daemon is like a construction team on the host machine.

# The Docker Engine on an Operating System

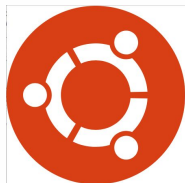
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# Docker images

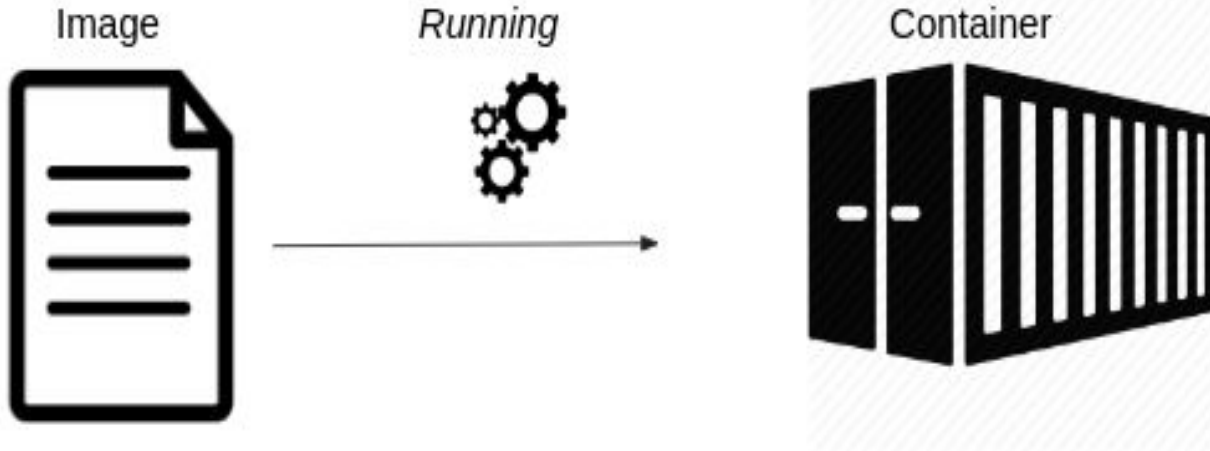
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- They are “ready-only templates with instructions for creating a Docker container.”
- Define the container code, libraries, environment variables, configuration files, and more.




# Image to container relationship


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# Dockerhub

 docker hub

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r-base ☆

[Docker Official Images](#)

R is a system for statistical computation and graphics.

↓ 1M+

Container

Linux

ARM 64

x86-64

Application Services

Official Image

Linux - ARM 64 ( latest ) ▾

Copy and paste to pull this image

```
docker pull r-base
```



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DESCRIPTION

REVIEWS

TAGS

Supported tags and respective **Dockerfile** links



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# Code



# Hands-on

