

# Coding Maker Camp-2025

## 1: Welcome to R – Let’s Print and Play!



Goal:

Introduce R, run first commands, and build confidence.



Concepts:

- What is R and what can it do?
- Printing messages
- Doing math in R



Code Examples:

```
# Print a message
print("Hello, R world!")

## [1] "Hello, R world!"
```

## Do some math

```
3 + 4
## [1] 7
10 * 2
## [1] 20
(5 + 3) / 2
## [1] 4
```



Activity:

- Each student writes a custom “Hello” message.
- Try 3 different math problems and share fun answers.

### Challenge:

Write a simple sentence with your name and favorite food:

```
name <- "Jianping"  
food <- "dumplings"  
print(paste(name, "loves", food, "!"))  
  
## [1] "Jianping loves dumplings!"
```

## 2: Drawing with Data – Make Art with Code

### Goal:

Introduce ggplot2 and simple shapes.

### Concepts:

- Install and load packages
- ggplot2
- Use geom\_rect() and geom\_point()

### Code Examples:

```
# Install ggplot2 (only once)  
install.packages("ggplot2")  
  
# Load it  
library(ggplot2)  
  
## Warning: package 'ggplot2' was built under R version 4.3.3
```

## Make a simple colored square

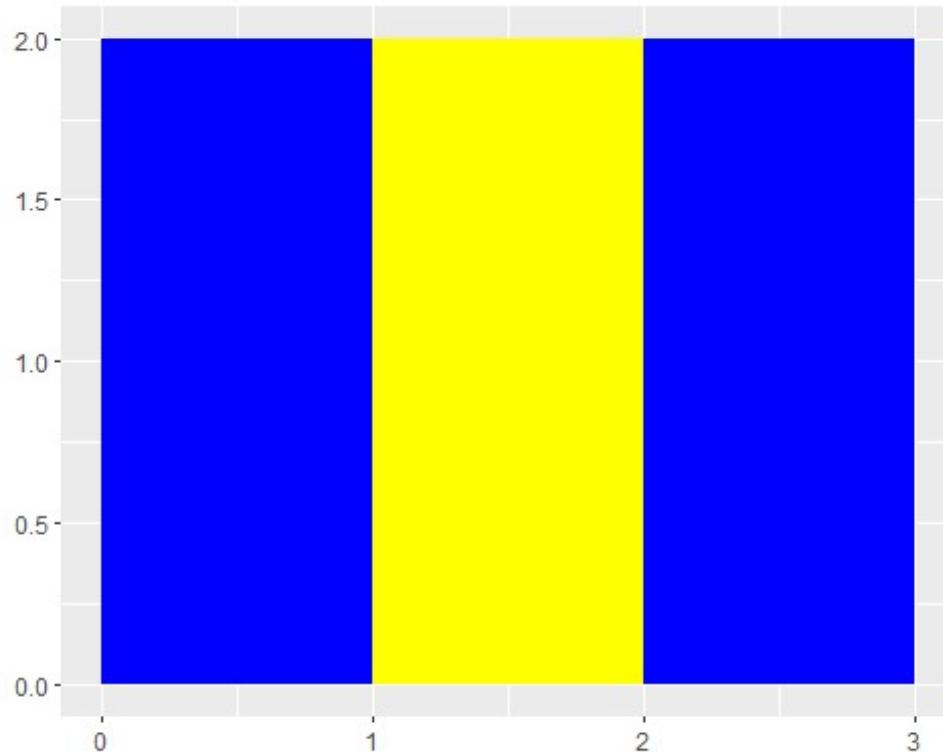
```
ggplot() +  
  geom_rect(aes(xmin=0, xmax=1, ymin=0, ymax=1), fill="pink")
```



⌚ Activity:

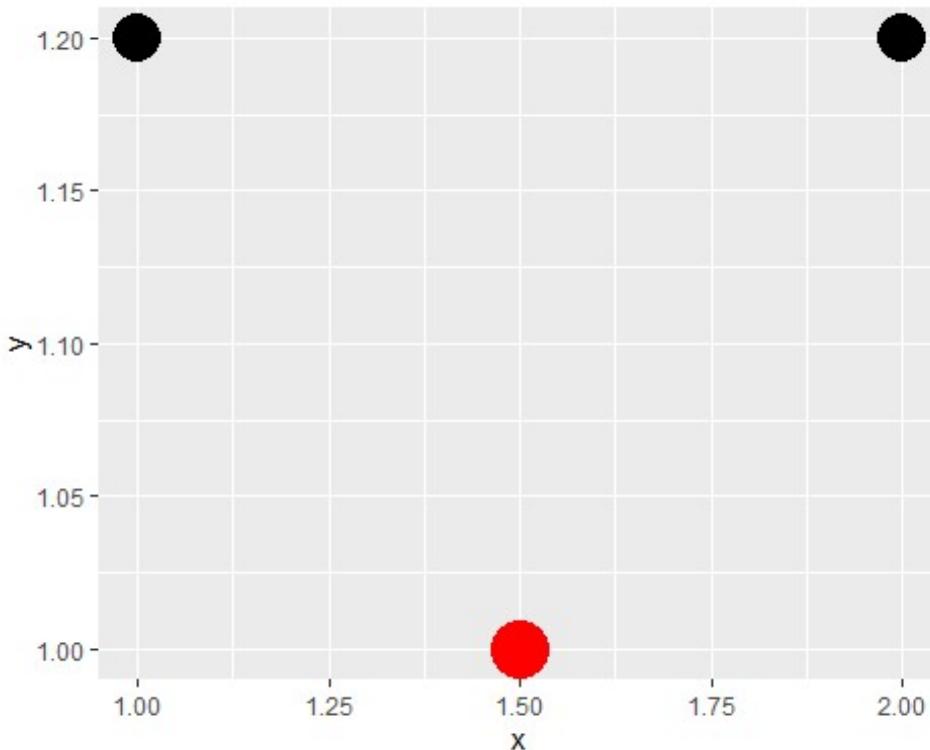
- Create your own flag using 2–3 rectangles.

```
ggplot() +  
  geom_rect(aes(xmin=0, xmax=1, ymin=0, ymax=2), fill="blue") +  
  geom_rect(aes(xmin=1, xmax=2, ymin=0, ymax=2), fill="yellow") +  
  geom_rect(aes(xmin=2, xmax=3, ymin=0, ymax=2), fill="blue")
```



- Try drawing a face using points:

```
ggplot() +  
  geom_point(aes(x=1.5, y=1), size=10, color="red") +    # nose  
  geom_point(aes(x=1, y=1.2), size=8) + # left eye  
  geom_point(aes(x=2, y=1.2), size=8)  # right eye
```



### ■ 3: Charts of Our Favorite Things

Goal:

Create basic charts using student-made data.

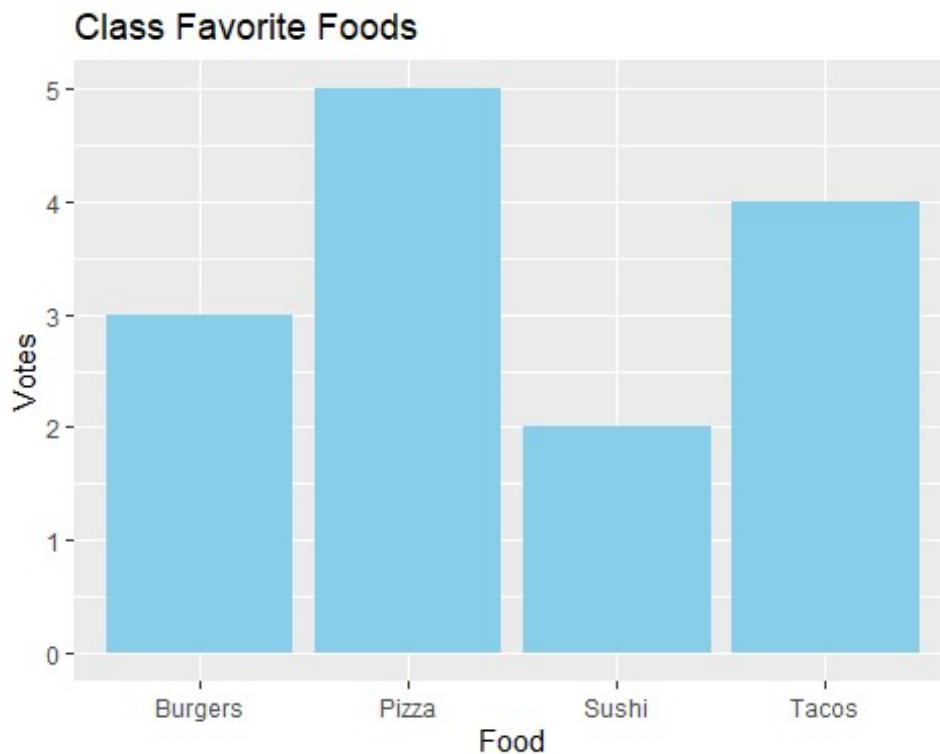
Concepts:

- Vectors and data frames
- Simple bar plots with ggplot2

## Code Examples:

```
# Favorite foods
foods <- data.frame(
  item = c("Pizza", "Burgers", "Tacos", "Sushi"),
  votes = c(5, 3, 4, 2)
)

# Bar chart
ggplot(foods, aes(x=item, y=votes)) +
  geom_bar(stat="identity", fill="skyblue") +
  labs(title="Class Favorite Foods", x="Food", y="Votes")
```



## Activity:

- Students make a small data frame of their own top 3 favorite things (games, snacks, animals).
- Chart it and customize colors.

## 4: Tell a Story with Data



Goal:

Use real-world data to tell a story.



Concepts:

- Pie chart plots with labels



Code Example:

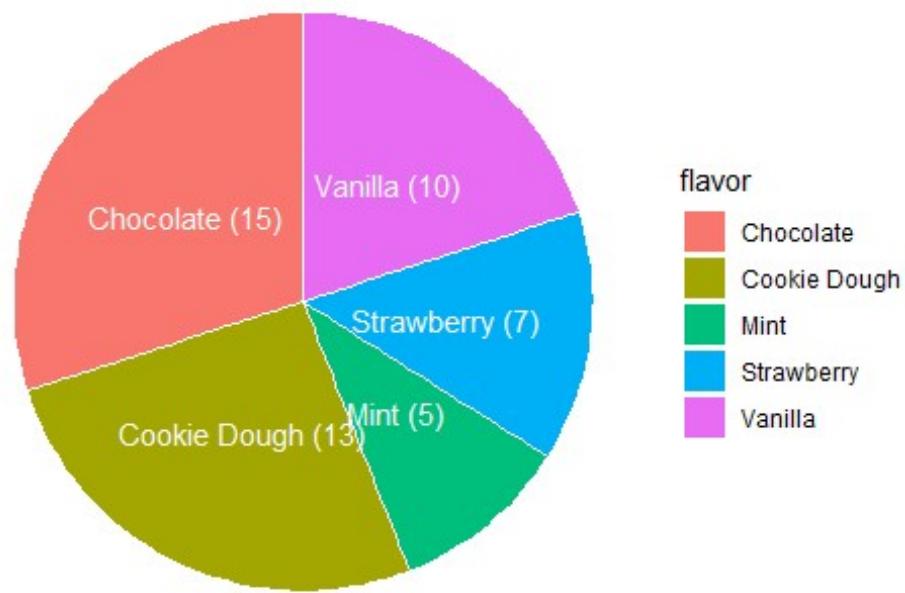
```
# Ice cream flavor preferences
flavors <- c("Vanilla", "Chocolate", "Strawberry", "Mint", "Cookie Dough")
votes <- c(10, 15, 7, 5, 13)

flavor_data <- data.frame(
  flavor = c("Vanilla", "Chocolate", "Strawberry", "Mint", "Cookie Dough"),
  votes = c(10, 15, 7, 5, 13)
)

# Compute percentages and labels
flavor_data$fraction <- flavor_data$votes / sum(flavor_data$votes)
flavor_data$label <- paste0(flavor_data$flavor, " (", flavor_data$votes, ")")

# Create the pie chart
ggplot(flavor_data, aes(x = "", y = fraction, fill = flavor)) +
  geom_bar(width = 1, stat = "identity", color = "white") +
  coord_polar(theta = "y") +
  labs(title = "Favorite Ice Cream Flavors", x = NULL, y = NULL) +
  theme_void() +
  geom_text(aes(label = label),
            position = position_stack(vjust = 0.5),
            color = "white",
            size = 4)
```

## Favorite Ice Cream Flavors



### ⌚ Activity:

- Use a sample CSV file (e.g., candy rankings, pet stats).
- Make a chart that tells a fun story.
- Add titles and labels to make it readable.