BIOSTAT620 Pset 1

Your Name

2025-01-20

```r
# Function to solve quadratic equation
# Function to solve quadratic equation
solve_quadratic <- function(a, b, c) {
  discriminant <- b^2 - 4 * a * c
  if (discriminant < 0) {
    return("no real solutions") # If discriminant < 0, no real solutions
  } else {
    solutions <- c(
      (-b + sqrt(discriminant)) / (2 * a), # First solution
      (-b - sqrt(discriminant)) / (2 * a)  # Second solution
    )
    return(unique(solutions))
  }
}

# File names for input and output
input_files <- c("coefs1.txt", "coefs2.txt", "coefs3.txt")

# Loop through each input file
for (i in seq_along(input_files)) {
  # Construct relative path for input file
  input_path <- file.path("../data", input_files[i])

  # Read coefficients from the file
  coefs <- scan(input_path, quiet = TRUE)

  # Extract coefficients
  a <- coefs[1]
  b <- coefs[2]
  c <- coefs[3]
```

```
  # Solve the quadratic equation
  solutions <- solve_quadratic(a, b, c)

  # Print the solutions
  print(paste("Solutions for", input_files[i], ":", solutions))

  # Save the solutions to a file
  output_path <- file.path("../results", paste0("results", i, ".txt"))
  writeLines(as.character(solutions), con = output_path)
}
```

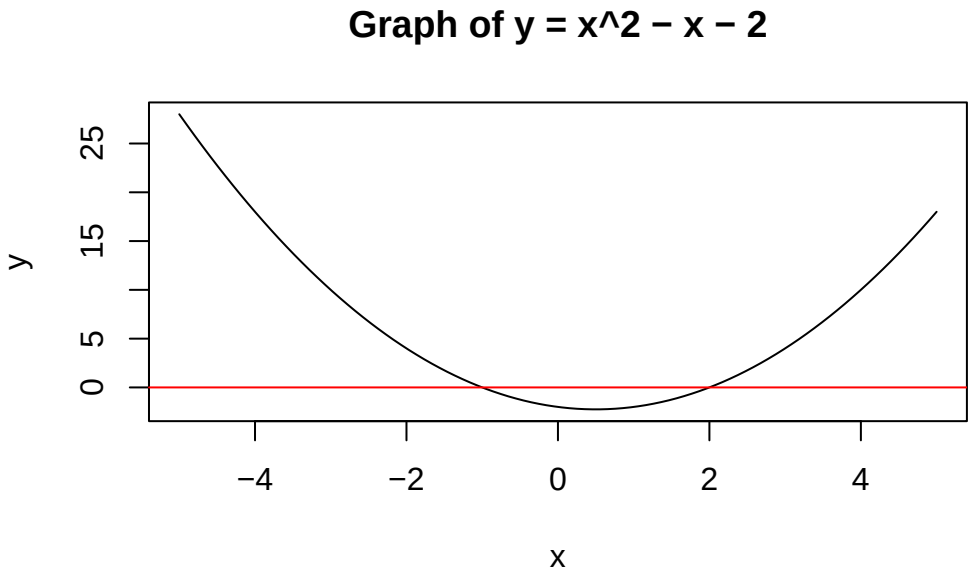
```
[1] "Solutions for coefs1.txt : 2"  "Solutions for coefs1.txt : -1"
[1] "Solutions for coefs2.txt : 1"
[1] "Solutions for coefs3.txt : no real solutions"
```

```
# Generate a sequence of x values
x <- seq(-5, 5, length = 100)

# Define the function y = x^2 - x - 2
y <- x^2 - x - 2

# Plot the function
plot(x, y, type = "l", main = "Graph of y = x^2 - x - 2", xlab = "x", ylab = "y")

# Add the x-axis (y = 0)
abline(h = 0, col = "red")
```


Graph of y = x^2 − x − 2
y
0
5
15
25
−4
−2
0
2
4
x