

How do I solve a system of equations in R?

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To solve a system of equations in R, you can use the "solve()" function which takes in two arguments: a matrix of coefficients and a vector of constants. The matrix should have the same number of rows as the number of equations and the same number of columns as the number of variables. The vector should have the same number of elements as the number of equations. Once the function is executed, it will return a vector of solutions for each variable in the system. Alternatively, you can also use the "solve" function from the "MASS" package which allows for solving systems with multiple solutions or no solutions. By inputting the equations in matrix form and using these functions, you can efficiently and accurately solve systems of equations in R.

Solve a System of Equations in R (3 Examples)

To solve a system of equations in R, we can use the built-in solve() function.

The following examples show how to use this functions to solve several different systems of equations in R.

Example 1: Solve System of Equations with Two Variables

Suppose we have the following system of equations and we'd like to solve for the values of x and y:

$$5x + 4y = 35$$

$$2x + 6y = 36$$

The following code shows how to use the solve() function in R to solve for the values of x and y:

#define left-hand side of equations

```
left_matrix <- matrix(c(5, 2, 4, 6), nrow=2)
```

```
left_matrix
```

```
5 4
```

```
2 6
```

```
#define right-hand side of equations
```

```
right_matrix <- matrix(c(35, 36), nrow=2)
```

```
right_matrix
```

```
35
```

```
36
```

```
#solve for x and y
```

```
solve(left_matrix, right_matrix)
```

```
3
```

```
5
```

This tells us that the value for x is 3 and the value for y is 5.

Example 2: Solve System of Equations with Three Variables

Suppose we have the following system of equations

and we'd like to solve for the values of x , y , and z :

$$4x + 2y + 1z = 34$$

$$3x + 5y - 2z = 41$$

$$2x + 2y + 4z = 30$$

The following code shows how to use the `solve()` function in R to solve for the values of x , y , and z :

```
#define left-hand side of equations
```

```
left_matrix <- matrix(c(4, 3, 2, 2, 5, 2, 1, -2, 4), nrow=3)
```

```
left_matrix
```

```
4 2 1
```

```
3 5 -2
```

```
2 2 4
```

```
#define right-hand side of equations
```

```
right_matrix <- matrix(c(34, 41, 30), nrow=3)
```

```
right_matrix
```

```
34
```

```
41
```

30

#solve for x, y, and z

solve(left_matrix, right_matrix)

5

6

2

This tells us that the value for x is 5, the value for y is 6, and the value for z is 2.

Example 3: Solve System of Equations with Four Variables

Suppose we have the following system of equations and we'd like to solve for the values of w, x, y, and z:

$$6w + 2x + 2y + 1z = 37$$

$$2w + 1x + 1y + 0z = 14$$

$$3w + 2x + 2y + 4z = 28$$

$$2w + 0x + 5y + 5z = 28$$

The following code shows how to use the solve() function in R to solve for the values of w, x, y, and z:

```
#define left-hand side of equations
```

```
left_matrix <- matrix(c(6, 2, 3, 2, 2, 1, 2, 0, 2, 1, 2, 5, 1, 0,  
4, 5), nrow=4)
```

```
left_matrix
```

```
6 2 2 1
```

```
2 1 1 0
```

```
3 2 2 4
```

```
2 0 5 5
```

```
#define right-hand side of equations
```

```
right_matrix <- matrix(c(37, 14, 28, 28), nrow=4)
```

```
right_matrix
```

```
37
```

```
14
```

```
28
```

```
28
```

```
#solve for w, x, y and z
```

```
solve(left_matrix, right_matrix)
```

```
4
```

```
3
```

3

1

This tells us that the value for w is 4, x is 3, y is 3, and z is 1.

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