

Foundations of R Software

Lecture 8

Basics of Calculations

⋮

**R as a Calculator with Scalars and Data Vectors :
Addition, Subtraction, Multiplication & Division**

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R as a calculator

R can perform all standard calculations like addition, subtraction, multiplication, division etc.

R has built in functions for computations.

R can operator over scalars and data vectors.

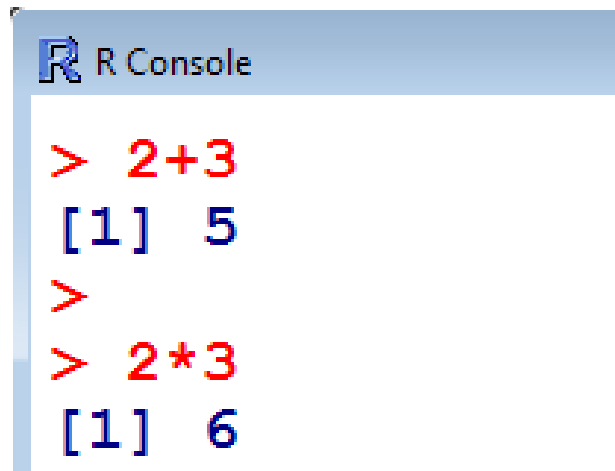
R computations can be carried out with

- **Scalar versus scalar.**
- **Scalar versus data vectors.**
- **Data vectors versus data vectors.**

R as a calculator

```
> 2+3          # Command for addition  
[1] 5          # Output
```

```
> 2*3          # Command for multiplication  
[1] 6          # Output
```



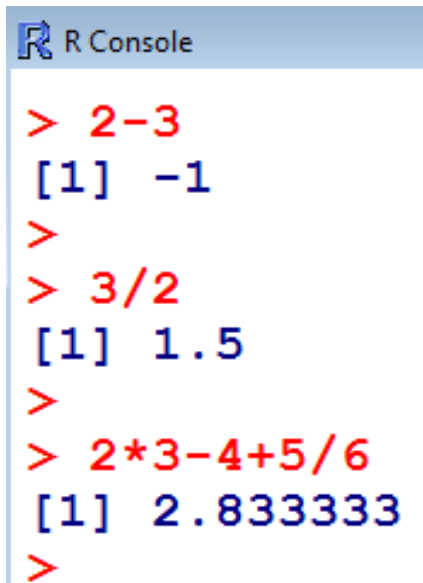
```
R Console  
> 2+3  
[1] 5  
>  
> 2*3  
[1] 6
```

R as a calculator

```
> 2-3          # Command for subtraction  
[1] -1         # Output
```

```
> 3/2          # Command for division  
[1] 1.5        # Output
```

```
> 2*3-4+5/6    # Command  
[1] 2.8333      # Output
```



The screenshot shows the R Console window with the following text:

```
R Console  
> 2-3  
[1] -1  
>  
> 3/2  
[1] 1.5  
>  
> 2*3-4+5/6  
[1] 2.833333  
>
```

R as a calculator

BODMAS rule is applicable.

**B-Brackets, O-Orders (powers), D-Division, M-Multiplication,
A-Addition, S-Subtraction.**

**The mathematical expressions with multiple operators are solved
from left to right in this order.**

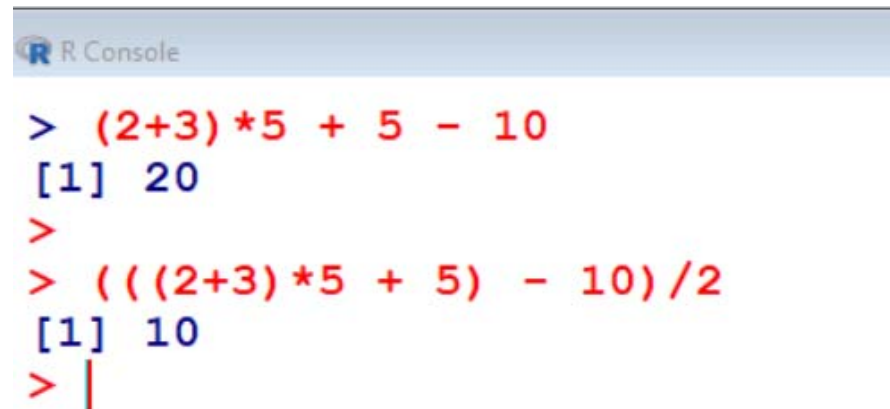
Only () brackets are used for BODMAS.

No brackets { } and [] are used in BODMAS.

R as a calculator

```
> (2+3)*5 + 5 - 10 # Command for BODMAS  
[1] 20              # Output
```

```
> (((2+3)*5 + 5) - 10)/2 # Command for BODMAS  
[1] 10                    # Output
```



```
R Console  
  
> (2+3)*5 + 5 - 10  
[1] 20  
>  
> (((2+3)*5 + 5) - 10)/2  
[1] 10  
> |
```

R as a calculator

Blank space has no role in calculations

```
> 2+5
```

```
[1] 7
```

```
> 2 + 5
```

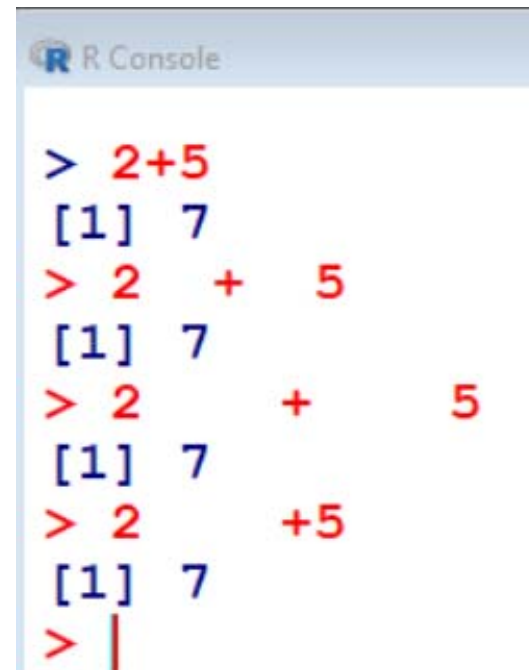
```
[1] 7
```

```
> 2    +    5
```

```
[1] 7
```

```
> 2      +5
```

```
[1] 7
```



```
R Console  
  
> 2+5  
[1] 7  
  
> 2 + 5  
[1] 7  
  
> 2    +    5  
[1] 7  
  
> 2      +5  
[1] 7  
  
> |
```

Addition with scalar

```
> c(2,3,5,7) + 10  
[1] 12 13 15 17
```

$2+10, 3+10, 5+10, 7+10$

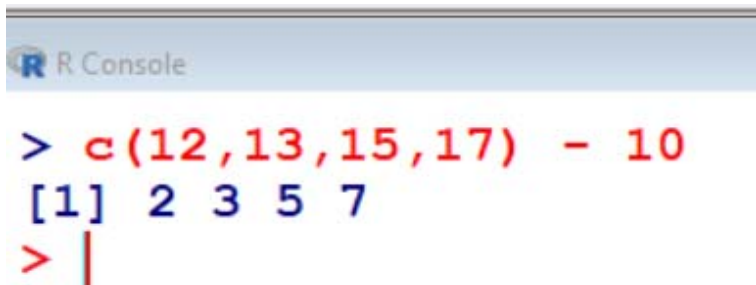
 R Console

```
> c(2,3,5,7) + 10  
[1] 12 13 15 17
```

Subtraction with scalar

```
> c(12,13,15,17) - 10  
[1] 2 3 5 7
```

$12-10, 13-10, 15-10, 17-10$

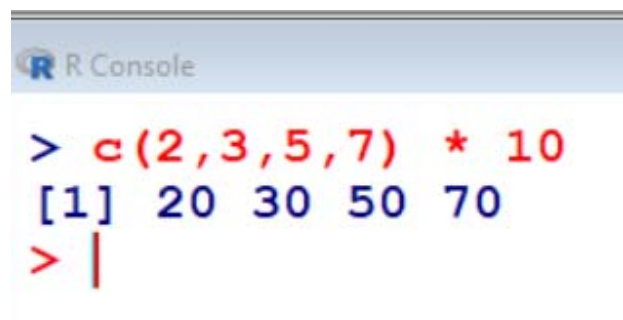
A screenshot of the R Console window. The title bar says "R Console". The console shows the command `> c(12,13,15,17) - 10` in red text, followed by the output `[1] 2 3 5 7` in blue text. A red prompt character `>` and a vertical cursor bar are visible on the next line.

```
> c(12,13,15,17) - 10  
[1] 2 3 5 7  
> |
```

Multiplication with scalar

```
> c(2,3,5,7) * 10  
[1] 20 30 50 70
```

2×10 , 3×10 , 5×10 , 7×10



```
R Console  
> c(2,3,5,7) * 10  
[1] 20 30 50 70  
> |
```

Division with scalar

```
> c(12,13,15,17) / 10  
[1] 1.2 1.3 1.5 1.7
```

$12 \div 10$, $13 \div 10$, $15 \div 10$, $17 \div 10$

R Console

```
> c(12,13,15,17) / 10  
[1] 1.2 1.3 1.5 1.7  
> |
```