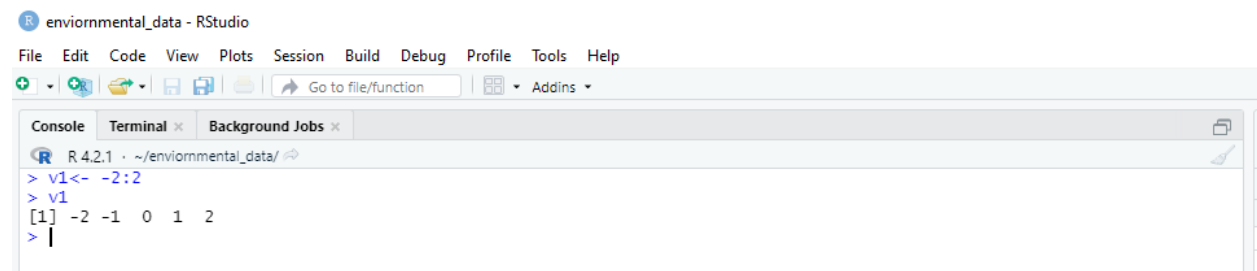


Variables

1. Character
2. Numeric
3. Character
4. It would return an error ("non-numeric argument to binary operator",) because you can't add two different data types.
5. Variables b1 and c1 are not the same data types. Because it is a decimal value, variable b1 is numeric while c1 is an integer because it is a whole number.
6. When you add b1 and c1, it returns: 45.6, 46.6, 46.6, 48.6. This means that the code adds the variable b1 to each integer within the sequence of variable c1. Thus, since variable c1 contains the sequence of integers from 0 to 3, variable b1 (45.6) is added to each 0, 1, 2 and 3 individually.

Vectors

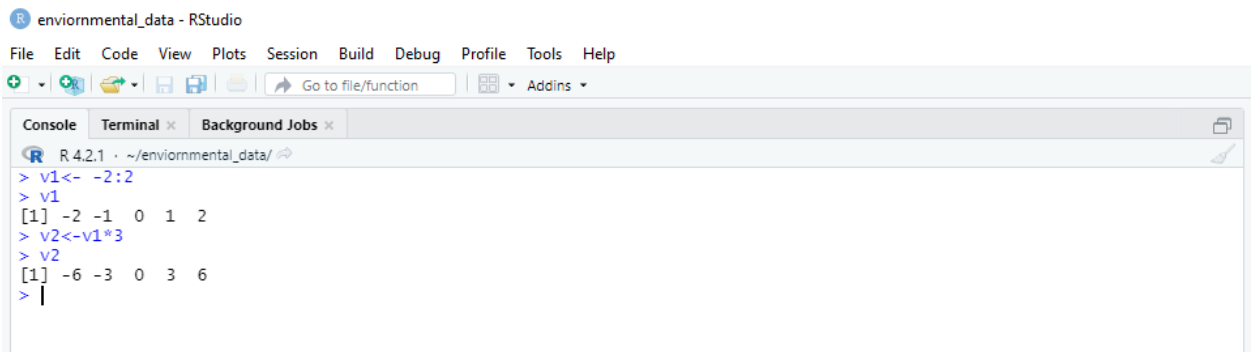
7.



A screenshot of the RStudio console window. The title bar reads "environmental_data - RStudio". The menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, and Help. The toolbar shows icons for file operations and a search bar. The console pane shows the following R code and output:

```
R 4.2.1 ~ ~/environmental_data/  
> v1<- -2:2  
> v1  
[1] -2 -1 0 1 2  
> |
```

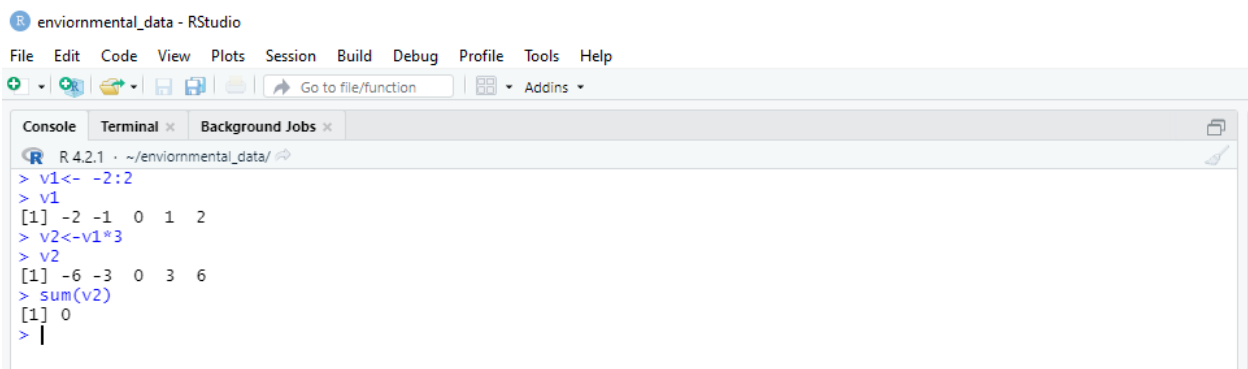
8.



A screenshot of the RStudio console window. The title bar reads "environmental_data - RStudio". The menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, and Help. The toolbar shows icons for file operations and a search bar. The console pane shows the following R code and output:

```
R 4.2.1 ~ ~/environmental_data/  
> v1<- -2:2  
> v1  
[1] -2 -1 0 1 2  
> v2<-v1*3  
> v2  
[1] -6 -3 0 3 6  
> |
```

9.



A screenshot of the RStudio console window. The title bar reads "environmental_data - RStudio". The menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Profile, Tools, and Help. The toolbar shows icons for file operations and a search bar. The console pane shows the following R code and output:

```
R 4.2.1 ~ ~/environmental_data/  
> v1<- -2:2  
> v1  
[1] -2 -1 0 1 2  
> v2<-v1*3  
> v2  
[1] -6 -3 0 3 6  
> sum(v2)  
[1] 0  
> |
```

Matrices

10.

```
> mat_1<- matrix(vec_4,byrow=TRUE,nrow=3,ncol=4)
> mat_1
      [,1] [,2] [,3] [,4]
[1,]     1     2     3     4
[2,]     5     6     7     8
[3,]     9    10    11    12
> |
```

11.

```
> mat_2<- matrix(vec_4,byrow=FALSE, nrow=3,ncol=4)
> mat_2
      [,1] [,2] [,3] [,4]
[1,]     1     4     7    10
[2,]     2     5     8    11
[3,]     3     6     9    12
> |
```

Lists

12.

```
> my_list<- list("two"=5.2, "one"="five point two", "three"=0:5)
> view(my_list)
> |
```

13.

```
> my_list[[3]]
[1] 0 1 2 3 4 5
> |
```

14.

```
> my_list$one
[1] "five point two"
> |
```

Logical Tests and Subsetting

15.

```
> my_vec=rep(1:3,5)
> my_vec
[1] 1 2 3 1 2 3 1 2 3 1 2 3 1 2 3
> my_bool_vec<-c(my_vec)==3
> my_bool_vec
[1] FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE FALSE  TRUE FALSE
[11] FALSE  TRUE FALSE FALSE  TRUE
> data.frame(my_vec,my_bool_vec)
  my_vec my_bool_vec
1      1      FALSE
2      2      FALSE
3      3       TRUE
4      1      FALSE
5      2      FALSE
6      3       TRUE
7      1      FALSE
8      2      FALSE
9      3       TRUE
10     1      FALSE
11     2      FALSE
12     3       TRUE
13     1      FALSE
14     2      FALSE
15     3       TRUE
> |
```

16.

```
> my_vec[my_bool_vec==TRUE]
[1] 3 3 3 3 3
> |
```