1. Test whether two vectors are exactly equal (element by element)

vec1 = c(rownames(mtcars[1:15,]))
vec2 = c(rownames(mtcars[11:25,]))

#returns TRUE / False
isTRUE(all.equal(vec1,vec2))
#returns TRUE / False
identical(vec1, vec2)
#returns number of differences
all.equal(vec1, vec2)

```
> isTRUE(all.equal(vec1,vec2))
[1] FALSE
> identical(vec1, vec2)
[1] FALSE
> all.equal(vec1, vec2)
[1] "15 string mismatches"
```

2. Sort the character vector in ascending order and descending order
vec1 = c(rownames(mtcars[1:15,]))
vec2 = c(rownames(mtcars[11:25,]))

returns ascending order
sort(vec1)
sort(vec2)

returns descending order
sort(vec1, decreasing = TRUE)
sort(vec2, decreasing = TRUE)

```
> # returns ascending order
> sort(vec1)
 [1] "Cadillac Fleetwood" "Datsun 710"         "Duster 360"
 [4] "Hornet 4 Drive"     "Hornet Sportabout"  "Mazda RX4"
 [7] "Mazda RX4 Wag"      "Merc 230"           "Merc 240D"
[10] "Merc 280"           "Merc 280C"          "Merc 450SE"
[13] "Merc 450SL"         "Merc 450SLC"        "Valiant"
> sort(vec2)
 [1] "AMC Javelin"          "Cadillac Fleetwood"  "Camaro Z28"
 [4] "Chrysler Imperial"    "Dodge Challenger"    "Fiat 128"
 [7] "Honda Civic"          "Lincoln Continental" "Merc 280C"
[10] "Merc 450SE"           "Merc 450SL"          "Merc 450SLC"
[13] "Pontiac Firebird"     "Toyota Corolla"      "Toyota Corona"
> # returns descending order
> sort(vec1, decreasing = TRUE)
 [1] "Valiant"            "Merc 450SLC"        "Merc 450SL"
 [4] "Merc 450SE"         "Merc 280C"          "Merc 280"
 [7] "Merc 240D"          "Merc 230"           "Mazda RX4 Wag"
[10] "Mazda RX4"          "Hornet Sportabout"  "Hornet 4 Drive"
[13] "Duster 360"         "Datsun 710"         "Cadillac Fleetwood"
```

```
> sort(vec2, decreasing = TRUE)
 [1] "Toyota Corona"       "Toyota Corolla"      "Pontiac Firebird"
 [4] "Merc 450SLC"         "Merc 450SL"          "Merc 450SE"
 [7] "Merc 280C"           "Lincoln Continental" "Honda Civic"
[10] "Fiat 128"            "Dodge Challenger"    "Chrysler Imperial"
[13] "Camaro Z28"          "Cadillac Fleetwood"  "AMC Javelin"
```

3. What is the major difference between str c() and paste() show an example.

#returns the value, class and number of elements
str(vec1)
#returns the values only
paste(vec1)

```
> #returns the value, class and number of elements
> str(vec1)
 chr [1:15] "Mazda RX4" "Mazda RX4 Wag" "Datsun 710" "Hornet 4 Drive" ...
> #returns the values only
> paste(vec1)
 [1] "Mazda RX4"          "Mazda RX4 Wag"      "Datsun 710"
 [4] "Hornet 4 Drive"     "Hornet Sportabout"  "Valiant"
 [7] "Duster 360"         "Merc 240D"          "Merc 230"
[10] "Merc 280"           "Merc 280C"          "Merc 450SE"
[13] "Merc 450SL"         "Merc 450SLC"        "Cadillac Fleetwood"
```

4. Introduce a separator when concatenating the strings

exp1 <- c("A", "B","C")
exp2 <- c("D", "E","F")
paste(exp1, exp2)
paste(exp1, exp2, sep = ",")
paste(exp1, exp2, sep = "-")

```
> exp1 <- c("A", "B","C")
> exp2 <- c("D", "E","F")
> paste(exp1, exp2)
[1] "A D" "B E" "C F"
> paste(exp1, exp2, sep = ",")
[1] "A,D" "B,E" "C,F"
> paste(exp1, exp2, sep = "-")
[1] "A-D" "B-E" "C-F"
```