# About programming in Base R

## Task 1: Basic Vector Practice

### Question 1 and 2

```
pre <- c(130, 128, 116, 124, 133, 134, 118, 126, 114, 127, 141, 138, 128, 140, 137, 131, 120, 128, 139, 135)
post <- c(114, 98, 113, 99, 107, 116, 113, 111, 119, 117, 101, 119, 130, 122, 106, 106, 124, 102, 117, 113)

subjectnames<-paste("Subject", 1:20, sep = "_")
names (pre) <- subjectnames
names (post) <- subjectnames
```

### Question 3

```
diff_op <- (pre - post)
diff_op
```

```
 Subject_1  Subject_2  Subject_3  Subject_4  Subject_5  Subject_6  Subject_7 
        16         30          3         25         26         18          5 
 Subject_8  Subject_9 Subject_10 Subject_11 Subject_12 Subject_13 Subject_14 
        15         -5         10         40         19         -2         18 
Subject_15 Subject_16 Subject_17 Subject_18 Subject_19 Subject_20 
        31         25         -4         26         22         22 
```

### Question 4

```
mean(diff_op)
```

```
[1] 17
```

### Question 5

```
which(diff_op >0)
```

```
 Subject_1  Subject_2  Subject_3  Subject_4  Subject_5  Subject_6  Subject_7 
         1          2          3          4          5          6          7 
 Subject_8 Subject_10 Subject_11 Subject_12 Subject_14 Subject_15 Subject_16 
         8         10         11         12         14         15         16 
Subject_18 Subject_19 Subject_20 
        18         19         20 
```

### Question 6 Subset for only for subjects with positive change

```
diff_op[ diff_op > 0]
```

```
 Subject_1  Subject_2  Subject_3  Subject_4  Subject_5  Subject_6  Subject_7 
        16         30          3         25         26         18          5 
 Subject_8 Subject_10 Subject_11 Subject_12 Subject_14 Subject_15 Subject_16 
        15         10         40         19         18         31         25 
Subject_18 Subject_19 Subject_20 
        26         22         22 
```

### Question 7 average of those that bp decreased

```
mean(diff_op > 0)
```

```
[1] 0.85
```

## Task 2: Basic Data Frame practice

### Question 1

make a data from with Patient, pre, post, diff_op

```
dataframeq1 <- data.frame(subjectnames, pre, post, diff_op)
```

### Question 2

```
dataframeq1[dataframeq1$diff_op < 0,]
```

```
           subjectnames pre post diff_op
Subject_9     Subject_9 114  119      -5
Subject_13   Subject_13 128  130      -2
Subject_17   Subject_17 120  124      -4
```

### Question 3

Adding new column to data frame

```
dataframeq1$post_less_than_120 <- dataframeq1$post < 120
```

### Question 4

print the data frame neatly

```
knitr::kable(dataframeq1)
```

| | subjectnames | pre | post | diff_op | post_less_than_120 |
|---|---|---|---|---|---|
| Subject_1 | Subject_1 | 130 | 114 | 16 | TRUE |
| Subject_2 | Subject_2 | 128 | 98 | 30 | TRUE |
| Subject_3 | Subject_3 | 116 | 113 | 3 | TRUE |
| Subject_4 | Subject_4 | 124 | 99 | 25 | TRUE |
| Subject_5 | Subject_5 | 133 | 107 | 26 | TRUE |
| Subject_6 | Subject_6 | 134 | 116 | 18 | TRUE |
| Subject_7 | Subject_7 | 118 | 113 | 5 | TRUE |
| Subject_8 | Subject_8 | 126 | 111 | 15 | TRUE |
| Subject_9 | Subject_9 | 114 | 119 | -5 | TRUE |
| Subject_10 | Subject_10 | 127 | 117 | 10 | TRUE |
| Subject_11 | Subject_11 | 141 | 101 | 40 | TRUE |
| Subject_12 | Subject_12 | 138 | 119 | 19 | TRUE |
| Subject_13 | Subject_13 | 128 | 130 | -2 | FALSE |
| Subject_14 | Subject_14 | 140 | 122 | 18 | FALSE |
| Subject_15 | Subject_15 | 137 | 106 | 31 | TRUE |
| Subject_16 | Subject_16 | 131 | 106 | 25 | TRUE |
| Subject_17 | Subject_17 | 120 | 124 | -4 | FALSE |
| Subject_18 | Subject_18 | 128 | 102 | 26 | TRUE |
| Subject_19 | Subject_19 | 139 | 117 | 22 | TRUE |
| Subject_20 | Subject_20 | 135 | 113 | 22 | TRUE |

## Task 3: List Practice

### Question 1

Creating a new treatment data from with n = 10

```
pre_placebo <- c(138, 135, 147, 117, 152, 134, 114, 121, 131, 130)
post_placebo <- c(105, 136, 123, 130, 134, 143, 135, 139, 120, 124)
diff_placebo <- pre_placebo - post_placebo
normal <-(post_placebo < 120)

subjectnames_placebo<-paste("Subject", 1:10, sep = "_")
names (pre_placebo) <- subjectnames_placebo
names (post_placebo) <- subjectnames_placebo
bp_df_placebo <- data.frame( subjectnames_placebo, pre_placebo, post_placebo, diff_placebo, normal)
```

### Question 2

Create and store a list with two elements

```
bp_list <- list (treatment= dataframeq1, placebo = bp_df_placebo)
```

### Question 3

Access the first list element using three different syntax

```
bp_list[1] #way 1
```

```
$treatment
           subjectnames pre post diff_op post_less_than_120
Subject_1     Subject_1 130  114      16               TRUE
Subject_2     Subject_2 128   98      30               TRUE
Subject_3     Subject_3 116  113       3               TRUE
Subject_4     Subject_4 124   99      25               TRUE
Subject_5     Subject_5 133  107      26               TRUE
Subject_6     Subject_6 134  116      18               TRUE
Subject_7     Subject_7 118  113       5               TRUE
Subject_8     Subject_8 126  111      15               TRUE
Subject_9     Subject_9 114  119      -5               TRUE
Subject_10   Subject_10 127  117      10               TRUE
Subject_11   Subject_11 141  101      40               TRUE
Subject_12   Subject_12 138  119      19               TRUE
Subject_13   Subject_13 128  130      -2              FALSE
Subject_14   Subject_14 140  122      18              FALSE
Subject_15   Subject_15 137  106      31               TRUE
Subject_16   Subject_16 131  106      25               TRUE
Subject_17   Subject_17 120  124      -4              FALSE
Subject_18   Subject_18 128  102      26               TRUE
Subject_19   Subject_19 139  117      22               TRUE
Subject_20   Subject_20 135  113      22               TRUE
```

```
#way 2
bp_list[[1]]
```

```
           subjectnames pre post diff_op post_less_than_120
Subject_1     Subject_1 130  114      16               TRUE
Subject_2     Subject_2 128   98      30               TRUE
Subject_3     Subject_3 116  113       3               TRUE
Subject_4     Subject_4 124   99      25               TRUE
Subject_5     Subject_5 133  107      26               TRUE
Subject_6     Subject_6 134  116      18               TRUE
Subject_7     Subject_7 118  113       5               TRUE
Subject_8     Subject_8 126  111      15               TRUE
Subject_9     Subject_9 114  119      -5               TRUE
Subject_10   Subject_10 127  117      10               TRUE
Subject_11   Subject_11 141  101      40               TRUE
Subject_12   Subject_12 138  119      19               TRUE
```

```
Subject_13   Subject_13 128  130      -2              FALSE
Subject_14   Subject_14 140  122      18              FALSE
Subject_15   Subject_15 137  106      31               TRUE
Subject_16   Subject_16 131  106      25               TRUE
Subject_17   Subject_17 120  124      -4              FALSE
Subject_18   Subject_18 128  102      26               TRUE
Subject_19   Subject_19 139  117      22               TRUE
Subject_20   Subject_20 135  113      22               TRUE
```

```
#way 3
bp_list$treatment
```

```
           subjectnames pre post diff_op post_less_than_120
Subject_1     Subject_1 130  114      16               TRUE
Subject_2     Subject_2 128   98      30               TRUE
Subject_3     Subject_3 116  113       3               TRUE
Subject_4     Subject_4 124   99      25               TRUE
Subject_5     Subject_5 133  107      26               TRUE
Subject_6     Subject_6 134  116      18               TRUE
Subject_7     Subject_7 118  113       5               TRUE
Subject_8     Subject_8 126  111      15               TRUE
Subject_9     Subject_9 114  119      -5               TRUE
Subject_10   Subject_10 127  117      10               TRUE
Subject_11   Subject_11 141  101      40               TRUE
Subject_12   Subject_12 138  119      19               TRUE
Subject_13   Subject_13 128  130      -2              FALSE
Subject_14   Subject_14 140  122      18              FALSE
Subject_15   Subject_15 137  106      31               TRUE
Subject_16   Subject_16 131  106      25               TRUE
Subject_17   Subject_17 120  124      -4              FALSE
Subject_18   Subject_18 128  102      26               TRUE
Subject_19   Subject_19 139  117      22               TRUE
Subject_20   Subject_20 135  113      22               TRUE
```

### Question 4

in one, access the placebo data frame, pre__bp column

```
bp_list [[2]] $pre_placebo
```

```
 [1] 138 135 147 117 152 134 114 121 131 130
```

## Task 4: Control Flow Practice

### Question 1

creating new column for each called status

```
dataframeq1$status <- character(20) #or 10 depending on number of observations
bp_df_placebo$status <-character(10)
```

###Question 2 non placebo data frame (with in the list), if/then/else logic

```r
for (i in 1:nrow(dataframeq1)) {

if (dataframeq1$post[i] <= 120) {
  dataframeq1$status[i] <- "optimal"

} else if (dataframeq1$post[i] < 120 & dataframeq1$post[i] <= 130) {
  dataframeq1$status[i] <- "borderline"

} else if(dataframeq1$post[i] > 130) {
  dataframeq1$status[i] <- "high"
}

}
```

#### Question 4

Repeat above process but for placebo

```r
for (i in 1:nrow(bp_df_placebo)) {

if (bp_df_placebo$post_placebo[i] <= 120) {
  bp_df_placebo$status[i] <- "optimal"

} else if (bp_df_placebo$post_placebo[i] < 120 & bp_df_placebo$post_placebo[i][i] <= 130) {
  bp_df_placebo$status[i] <- "borderline"

} else if(bp_df_placebo$post_placebo[i] > 130) {
  bp_df_placebo$status[i] <- "high"}
}
```

### Task 5: Function Writing

#### Question 1

```r
function_writing <- function (list) { #creating a function with an input and hopefully I can fill in
  #bp_list later
  mean(list)
}
```

I needed to somehow make mean the default for when I typed in chunk my function name (function_writing) it would return the mean hopefully it was numeric. If not another error would pop up. I would also be able to call my function in the console and it would yield the mean. And if I wanted other summary statistics then it would I would have to specify var (function_writing) or something similar. This question stumped me, I will need to attend office hours. I am going to turn this in Tuesday night wrong/ incomplete but if I think of how to fix by Wednesday night I will try again