BT307 LAB 1

Name: Aditya Jindal
Roll No.: 210106004

1)

```
> getwd()
[1] "C:/Users/adity/OneDrive/Desktop/BT307/Lab 1"
> #Question 1
> x <- 13.4 # numeric
> y <- 10L # integer
> z <- 5+3i # complex
> p <- 'R is an interesting programming language' # character
> q <- TRUE #logical
```

2)

```
> #Question 2
> x; class(x); typeof(x); attributes(x)
[1] 13.4
[1] "numeric"
[1] "double"
NULL
> y; class(y); typeof(y); attributes(y)
[1] 10
[1] "integer"
[1] "integer"
NULL
> z; class(z); typeof(z); attributes(z)
[1] 5+3i
[1] "complex"
[1] "complex"
NULL
> p; class(p); typeof(p); attributes(p)
[1] "R is an interesting programming language"
[1] "character"
[1] "character"
NULL
> q; class(q); typeof(q); attributes(q)
[1] TRUE
[1] "logical"
[1] "logical"
NULL
```

3)

```
> #Question 3
> x <- 1:10
> x; typeof(x); length(x)
 [1]  1  2  3  4  5  6  7  8  9 10
[1] "integer"
[1] 10
```

4)

```
> #Question 4
> #convert from numeric to integer
> a <- as.integer(x)
> a; class(a); typeof(a)
 [1]  1  2  3  4  5  6  7  8  9 10
[1] "integer"
[1] "integer"
> #convert from integer to numeric
> b <- as.numeric(y)
> b; class(b)
[1] 10
[1] "numeric"
```

5)

```
> #Question 5
> r <- as.raw(c(0x1, 0x2, 0x3, 0x4, 0x5))
> r
[1] 01 02 03 04 05
```

6)

```
> #Question 6
> print(is.logical(TRUE)) # Logical
[1] TRUE
> print(is.integer(3L)) # Integer
[1] TRUE
> print(is.numeric(10.5)) # Numeric
[1] TRUE
> print(is.complex(1+2i)) # Complex
[1] TRUE
> print(is.character("12-04-2020")) # Character
[1] TRUE
> print(is.integer("a"))
[1] FALSE
> print(is.numeric(2+3i))
[1] FALSE
> #Logical Data type
> variable_logical<- TRUE
> cat(variable_logical,"\n")
TRUE
> 2
[1] 2
> cat("The data type of variable_logical is",class(variable_logical),"\n")
The data type of variable_logical is logical
```

7)

```
> #Question 7
> vector()
logical(0)
> vector("character", length = 5)
[1] "" "" "" "" ""
```

```
> character(5)
[1] "" "" "" "" ""
> numeric(5)
[1] 0 0 0 0 0
> logical(5)
[1] FALSE FALSE FALSE FALSE FALSE
```

8)

```
> #Question 8
> x <- c(1,2,3)
> x; class(x); typeof(x)
[1] 1 2 3
[1] "numeric"
[1] "double"
> x1 <- c(1L,2L,3L)
> x1; class(x1); typeof(x1)
[1] 1 2 3
[1] "integer"
[1] "integer"
> y <- as.integer(x)
> y; class(y); typeof(y)
[1] 1 2 3
[1] "integer"
[1] "integer"
```

9)

```
> #Question 9
> z <- c("Sumit Ahire", "Sumit Kumar", "Sumit Nayan")
> z; class(z); typeof(z); length(z); str(z)
[1] "Sumit Ahire" "Sumit Kumar" "Sumit Nayan"
[1] "character"
[1] "character"
[1] 3
 chr [1:3] "Sumit Ahire" "Sumit Kumar" "Sumit Nayan"
```

10)

```
> #Question 10
> z <- c(z, "Sumit Shankar")
> z; class(z); typeof(z); length(z); str(z)
[1] "Sumit Ahire"   "Sumit Kumar"   "Sumit Nayan"   "Sumit Shankar"
[1] "character"
[1] "character"
[1] 4
 chr [1:4] "Sumit Ahire" "Sumit Kumar" "Sumit Nayan" "Sumit Shankar"
```

11)

```
> #Question 11
> x <- 1:10
> y <- seq(10)
> x; y
 [1]  1  2  3  4  5  6  7  8  9 10
```

```
 [1]  1  2  3  4  5  6  7  8  9 10
> z <- seq(from=1, to=100, by=5)
> z; class(z); typeof(z); length(z); str(z)
 [1]  1  6 11 16 21 26 31 36 41 46 51 56 61 66 71 76 81 86 91 96
[1] "numeric"
[1] "double"
[1] 20
 num [1:20] 1 6 11 16 21 26 31 36 41 46 ...
```

12)

```
> #Question 12
> x <- c(0.5, NA, 0.7)
> x; class(x); typeof(x)
[1] 0.5  NA 0.7
[1] "numeric"
[1] "double"
> x <- c(TRUE, FALSE, NA)
> x; class(x); typeof(x)
[1]  TRUE FALSE    NA
[1] "logical"
[1] "logical"
> x <- c("a", NA, "c", "d", "e")
> x; class(x); typeof(x)
[1] "a" NA  "c" "d" "e"
[1] "character"
[1] "character"
> x <- c(1+5i, 2-3i, NA)
> x; class(x); typeof(x)
[1] 1+5i 2-3i   NA
[1] "complex"
[1] "complex"
```

13)

```
> #Question 13
> x <- c("a", NA, "c", "d", NA)
> y <- c("a", "b", "c", "d", "e")
> is.na(x); is.na(y)
[1] FALSE  TRUE FALSE FALSE  TRUE
[1] FALSE FALSE FALSE FALSE FALSE
> anyNA(x); anyNA(y)
[1] TRUE
[1] FALSE
```

14)

```
> #Question 14
> x1 <- c(1.7, "a")
> x1; class(x1)
[1] "1.7" "a"
[1] "character"
> x2 <- c(TRUE, 2)
> x2; class(x2)
[1] 1 2
```

```
[1] "numeric"
> x3 <- c("a", TRUE)
> x3; class(x3)
[1] "a"    "TRUE"
[1] "character"
```

15)

```
> #Question 15
> y1 <-as.numeric(x1)
Warning message:
NAs introduced by coercion
> y1
[1] 1.7  NA
> is.na(y1)
[1] FALSE  TRUE
```

16)

```
> #Question 16
> names(x1) <- c('Numeric', 'Character')
> x1
  Numeric Character
    "1.7"       "a"
> head(airquality)
  Ozone Solar.R Wind Temp Month Day
1    41     190  7.4   67     5   1
2    36     118  8.0   72     5   2
3    12     149 12.6   74     5   3
4    18     313 11.5   62     5   4
5    NA      NA 14.3   56     5   5
6    28      NA 14.9   66     5   6
> names(airquality)
[1] "Ozone"   "Solar.R" "Wind"    "Temp"    "Month"   "Day"
> # dimnames()
> x4 <- array(1:12)
> x4
 [1]  1  2  3  4  5  6  7  8  9 10 11 12
> x4 <- array(1:12, dim = c(1,2,2), dimnames = list(c("C1"), c("R1", "R2"),
c("M1", "M2")))
> x4
, , M1

   R1 R2
C1  1  2

, , M2

   R1 R2
C1  3  4
```