1. Using `rep()` and `seq()` as needed to create the following vectors. (The use of `c()` function is prohibited in this question.)

(a) 5 10 15 20 25 30 35 40 45 50

(b) 6 6 5 5 4 4 3 3 2 2 1 1

(c) 1 2 3 4 5 3 4 5 6 7 5 6 7 8 9 7 8 9 10 11

(d) 2 4 6 5 7 9 8 10 12 11 13 15   (Hint: `seq()` is not needed)

2. The information of overseas exchange participants is collected. The information collected include

- `school` - school of participant
- `destination` - destination of overseas exchange participant
- `age` - age of participants

(a) The data are stored in a data frame named `participants` as shown below.

```
> participants
  school destination age
1   CUHK      Austria  18
2   <NA>        Japan  20
3   HKBU        Korea  22
4  HKUST      Austria  NA
5   CUHK       Sweden  20
```

Write the R codes to create this data frame.

(b) It is found that "Australia" is mistyped as "Austria" in the data. Write the R codes to replace all "Austria" by "Australia" in `participants`.

(c) Write the R codes to change "`<NA>`" in the second row of `school` column in `participants` into "`HKU`".

3. (a) Write the R codes to create the following object named `list1`.

```
> list1
[[1]]
[1] "apple"  "banana"

[[2]]
[1] 1 2 3

[[3]]
      [,1] [,2] [,3] [,4] [,5]
[1,]    1    2    3    4    5
[2,]    6    7    8    9   10
```

(b) Write the R codes to change `list1` to a long vector.

(c) After finishing (b), write the output of the following codes (without using computer):

  i.   `class(list1)`
  ii. `mode(list1[3])`
  iii. `class(mode(list1))`
  iv. `mode(factor(c(list1[8],list1[9])))`