Live Session 07 Assignment

Samira Zarandioon

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Question 1

b. Following the tip, we use the program for part b to solve part a:

```
# Converts input prameter from base 10 to 7
base10to7 <- function(x) {
  i <- 0
  sum <- 0
  while(x%/%7!=0){
    sum <- sum + ( (x%%7) * (10^i) )
    i <- i+1
    x <- x%/%7
  }
  sum <- sum + ( (x%%7) * (10^i) )
  return(sum)
}
base10to7(101)
```

```
## [1] 203
```

a.

```
# Counts in base 7 up to the input parameter
p7 <- function(n) {
  base_7_seq = c()
  for(i in 0:(n-1)) {
    base_7_seq = c(base_7_seq, base10to7(i))
  }
  return(base_7_seq)
}
p7(5)
```

```
## [1] 0 1 2 3 4
```

```
p7(15)
```

```
##  [1]  0  1  2  3  4  5  6 10 11 12 13 14 15 16 20
```

```
p7(52)
```

```
##  [1]   0   1   2   3   4   5   6  10  11  12  13  14  15  16  20  21  22
## [18]  23  24  25  26  30  31  32  33  34  35  36  40  41  42  43  44  45
## [35]  46  50  51  52  53  54  55  56  60  61  62  63  64  65  66 100 101
## [52] 102
```

c.

```
# Convert the input parameter form base 7 to base 10
base7to10 <- function(x){
  i=0
  sum=0
```

```
  while(x!=0){
    d<-x%%10
    sum<-sum+d*7^i
    x<-(x-d)/10
    i<-i+1
  }
  return(sum)
}
base7to10(202)
```

```
## [1] 100
```

d.

```
# Convert the input parameter to the base parameter that is specified as the second parameter
base10tok <- function(x,k) {
  i=0
  sum=0
  while(x%/%k!=0){
    sum<-sum+((x%%k)*(10^i))
    i=i+1
    x<-x%/%k
  }
  sum<-sum+((x%%k)*(10^i))
  return(sum)
}
base10tok(100,5)
```

```
## [1] 400
```

```
# Counts up to the first input parameter in base that is specified as the second parameter
pk <- function(n,k) {
  base_k_seq = c()
  for(i in 0:(n-1)) {
    base_k_seq = c(base_k_seq, base10tok(i,k))
  }
  return(base_k_seq)
}
pk(5,3)
```

```
## [1]  0  1  2 10 11
```

```
# Converts the first input parameter from base 10 to the base that is specified as the second parameter
baseKto10 <- function(x, k){
  i=0
  sum=0
  while(x!=0){
    d<-x%%10
    sum<-sum+d*k^i
    x<-(x-d)/10
    i<-i+1
  }
  return(sum)
}
baseKto10(202,3)
```

```
## [1] 20
```