Digital Data Collection - Programming Extras

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Variables

```
uni <- "The University of Cambridge"
uni</pre>
```

[1] "The University of Cambridge"

Paying tax:

```
#9400 tax free
(20000-9440)*20/100

[1] 2112

#0R:
wage <- 20000
taxFree <- 9400
rate <- 20
(wage-taxFree)*rate/100
```

[1] 2120

Briefly about functions

```
plusOne <- function(x){
    return(x+1)
    }

plusOne2 <- function(num){
    return(num+1)
    }</pre>
```

- Curly brackets {} include the code to be executed - Normal brackets () contain a list of variables

```
plusOne(8)
[1] 9
   plusOne2(10)
[1] 11
 plusOne2(num=5)
[1] 6
 #plusOne2(wrongVar=2)
```

Simple loops

```
for (number in 1:5){
    print (number)
}

[1] 1
[1] 2
[1] 3
[1] 4
[1] 5
```

Looping over functions

```
a <- c(1,2,3,4,5)
for (value in a){
    print (
         plusOne(value)
    )
}</pre>
[1] 2
[1] 3
[1] 4
```

[1] 5 [1] 6

```
listOfNumbers <- c(1,2,3,4,5)
for (number in listOfNumbers){
    print (
        number+1
    )
}</pre>
```

[1] 3[1] 4[1] 5[1] 6

More loops

```
a <- c(1,2,3,4,5)
a[1] #The first number in the vector

[1] 1
a[4] #The fourth number in the vector</pre>
```

```
for (i in 1:length(a)){
    print (
        plusOne(a[i])
    )
}
[1] 2
[1] 3
```

[1] 5 [1] 6

Functions without variables

```
printName <- function(){
   print ("My name is Rolf Fredheim")
}
printName()</pre>
```

[1] "My name is Rolf Fredheim"

This is a useless function. But sometimes, if we have many lines of code requiring no particular input, it can be useful to file them away like this.

e.g. for simulations

```
sillySimulation <- function(){</pre>
x1 \leftarrow runif(500, 80, 100)
x2 \leftarrow runif(500,0,100)
v1 < -c(x1, x2)
x3 \leftarrow runif(1000,0,100)
df <- data.frame(v1,x3)
require(ggplot2)
print(ggplot(df, aes(v1,x3))+geom_point()+ggtitle("simulation of some sort"))
```

==== Just as this slide hides the code on the previous slide, so the function hides the underlying code.

```
sillySimulation()
```

4 D > 4 A > 4 B > 4 B > B 900

Inserting variables

Let's hammer home how to use variables what variables could we add to the function below?

```
desperateTimes <- function(){
   print(pasteO("Rolf is struggling to finish his PhD on time. Time remaining: 6 mont)
}</pre>
```

Name

```
desperateTimes <- function(name){
   print(pasteO(name ," is struggling to finish his PhD on time. Time remaining: 6 most
}
desperateTimes(name="Tom")</pre>
```

[1] "Tom is struggling to finish his PhD on time. Time remaining: 6 months"

Gender

we specify a default value

```
desperateTimes <- function(name,gender="m"){
   if(gender=="m"){
      pronoun="his"
   }else{
      pronoun="her"
   }
   print(pasteO(name ," is struggling to finish ",pronoun," PhD on time. Time remaining)
   desperateTimes(name="Tanya",gender="f")</pre>
```

[1] "Tanya is struggling to finish her PhD on time. Time remaining: 6 months"

Is this a good function? Why (not)?

degree

```
desperateTimes <- function(name,gender="m",degree){
  if(gender=="m"){
    pronoun="his"
  }else{
    pronoun="her"
  }
  print(pasteO(name ," is struggling to finish ",pronoun," ",degree," on time. Time :
}
desperateTimes(name="Rolf",gender="m","Mphil")</pre>
```

[1] "Rolf is struggling to finish his Mphil on time. Time remaining: 6 months"

Days til deadline

```
require(lubridate)
require(ggplot2)
deadline=as.Date("2015-09-01")
daysLeft <- deadline-Sys.Date()
totDays <- deadline-as.Date("2011-10-01")
print(daysLeft)</pre>
Time difference of 190 days
```

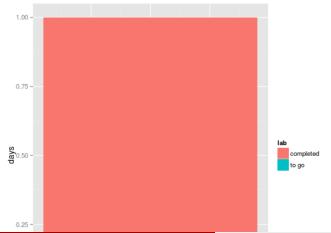
print(pasteO("Rolf is struggling to finish his PhD on time. Days remaining: ", as.nu

[1] "Rolf is struggling to finish his PhD on time. Days remaining: 190"

part2

```
print(paste0("Percentage to go: ",round(as.numeric(daysLeft)/as.numeric(totDays)*100
[1] "Percentage to go: 13"

df <- data.frame(days=c(daysLeft,totDays-daysLeft),lab=c("to go","completed"))
ggplot(df,aes(1,days,fill=lab))+geom_bar(stat="identity",position="fill")</pre>
```



File it away until in need of a reminder

timeToWorry()

Time difference of 190 days

- [1] "Rolf is struggling to finish his PhD on time. Days remaining: 190"
- [1] "Percentage to go: 13"

