Lab 1 - Basic R

Operators, Variables, Expressions, If/Else statements, While/For loops

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basic operators

+	addition
-	subtraction
*	multiplication
/	division
^	exponentiation

```
> 5+5
[1] 10
> 5-5
[1] 0
> 5*5
[1] 25
> 5/5
[1] 1
> 5^5
[1] 3125
```

<- = Variables

integer (numeric)

```
> number <- 6
> number
[1] 6
```

double (numeric)

```
> double <- 6.6
> double
[1] 6.6
```

string/character

```
> name <- "George"
> name
[1] "George"
```

Vectors

creating vectors

```
> shopping <- c("bananas", "oranges", "peanuts")
> shopping
[1] "bananas" "oranges" "peanuts"
```

indexing vectors

```
> shopping[2]
[1] "oranges"
```

```
> shopping[1:2]
[1] "bananas" "oranges"
```

```
> shopping[-2]
[1] "bananas" "peanuts"
```

manipulating vectors

```
> shopping[1] <- "peaches"
> shopping
[1] "peaches" "oranges" "peanuts"
```

summing vectors

```
> numbers <- c(1, 2, 3)
> total <- sum(numbers)
> total
[1] 6
```

logical expressions

==	are the two sides of **one** expression equal?
> <	is one side of **one** expression 'larger'?
&&	**and**: are both **expressions** TRUE?
||	**or**: is at least one **expression** TRUE?

control flow - if/else

if TRUE

{ do something }

else (if NOT true)

{ do something else }

```
if(10 > 5){
  print("10 is greater than 5")
} else {
  print("10 is not greater than 5")
}
```

```
[1] "10 is greater than 5"
```

control flow - for loops

for some **item** in a **list**

{ do something }

```
for(i in 1:10){
  print(i)
}
```

Important - the fact that we used **i *does not not matter***. You can use any variable name in place of **i**. Think of **i** as a 'placeholder'.

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

control flow - while loops

while **something** is **TRUE**

{ do something }

{ make sure that **something** is eventually **FALSE**}

```
i <- 1
while(i <= 5){
  print(i)
  i <- i + 1
}
```

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

i is 1. less than 5, print it. Add 1 to i.
i is 2. less than 5, print it. Add 1 to i.
i is 3. less than 5, print it. Add 1 to i.
i is 4. less than 5, print it. Add 1 to i.
i is 5. equal to 5, print it. Add 1 to i.
i is 6. **not less than** 5. do nothing.

?

questions?