

## session 3

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### R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
letters[1:5]
```

```
## [1] "a" "b" "c" "d" "e"
```

### Including Plots

You can also embed plots, for example:

```
letters[seq(1, length(letters), 2)]
```

```
## [1] "a" "c" "e" "g" "i" "k" "m" "o" "q" "s" "u" "w" "y"
```

```
paste('Count',1:10,sep=' ')
```

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

```
paste(letters[seq(1, length(letters), 2)],sep='',collapse='#')
```

```
## [1] "a#c#e#g#i#k#m#o#q#s#u#w#y"
```

```
paste(letters[seq(1, length(letters), 2)],sep='',collapse=' $ ')
```

```
## [1] "a $ c $ e $ g $ i $ k $ m $ o $ q $ s $ u $ w $ y"
```

```
print(pi)
```

```
## [1] 3.141593
```

```

round(pi, digits=2)

## [1] 3.14

sqrt(pi)

## [1] 1.772454

print(pi^5)

## [1] 306.0197

seq(0, 1, by = 0.02)

## [1] 0.00 0.02 0.04 0.06 0.08 0.10 0.12 0.14 0.16 0.18 0.20 0.22 0.24 0.26 0.28
## [16] 0.30 0.32 0.34 0.36 0.38 0.40 0.42 0.44 0.46 0.48 0.50 0.52 0.54 0.56 0.58
## [31] 0.60 0.62 0.64 0.66 0.68 0.70 0.72 0.74 0.76 0.78 0.80 0.82 0.84 0.86 0.88
## [46] 0.90 0.92 0.94 0.96 0.98 1.00

seq(1, 2, by = (1/12))

## [1] 1.000000 1.083333 1.166667 1.250000 1.333333 1.416667 1.500000 1.583333
## [9] 1.666667 1.750000 1.833333 1.916667 2.000000

runif(1)

## [1] 0.2480903

runif(1:10)

## [1] 0.08357816 0.38578625 0.58306764 0.19770612 0.41520262 0.59888414
## [7] 0.81302649 0.29883256 0.82268212 0.49950977

runif(10, min=0, max=100)

## [1] 36.6915753 45.8269107 97.8947370 96.7699184 8.7278147 48.0606239
## [7] 0.8716799 90.8150666 69.0074830 18.3269090

runif(20)*11

## [1] 2.975306 7.753773 4.580316 7.721592 5.936406 5.423792 4.289707
## [8] 8.872604 9.540241 10.358259 9.064348 3.305604 10.986772 2.045425
## [15] 8.608536 1.432055 3.093278 6.988718 9.811413 6.248379

```

```
floor(runif(20)*11)
```

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

```
sample(1:10,5)
```

```
## [1] 7 2 5 1 10
```

```
animals <- c('dog', 'cat', 'mouse', 'unicornr', 'bear', 'snake', 'whale', 'bull' )
```

```
"dog" %in% animals
```

```
## [1] TRUE
```

```
(c("cat", "snake") %in% animals)
```

```
## [1] TRUE TRUE
```

```
sum(c("cat", "snake") %in% animals)
```

```
## [1] 2
```

```
sum(startsWith(animals,"b"))
```

```
## [1] 2
```

```
l <- list('name', 5, letters[1:5])
```

```
““
```