Lab class 6 10-18-24

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Quarto

Quarto enables you to weave together content and executable code into a finished document. To learn more about Quarto see https://quarto.org.

Running Code

When you click the **Render** button a document will be generated that includes both content and the output of embedded code. You can embed code like this:

```
add<-function(x,y){x+y}
add(4,8)
```

```
[1] 12
```

```
add(3,1)
```

```
[1] 4
```

```
add(c(100,1,100),1)
```

```
[1] 101   2 101
```

Make a function "generate_DNA()" that makes a random nucleotide sequence of any length.

```
# generate_DNA<-function()
bases<-c("A","C","G","T")

sequence<-sample(x=bases,size=1,replace=TRUE,prob=NULL)

generate_DNA<-function(length){
  bases<-c("A","C","G","T")
  sequence<-sample(bases,size=length,replace=TRUE,prob=NULL)
  return(sequence)
}
generate_DNA(9)
```

```
[1] "C" "C" "G" "C" "G" "A" "A" "C" "C"
```

make a function that can generate random protein sequences of a given length

install.packages("bio3d")

```
generate_protein<-function(length){
  aa<-unique(bio3d::aa.table$aa1)
  seq<-sample(aa,size=length,replace=TRUE)
  seq<-paste(seq, collapse="")
  return(seq)
}
generate_protein(2)
```

```
[1] "QC"
```

```
# generate protein sequences of length 6-13

answer<-sapply(6:12,generate_protein)
answer
```

```
[1] "TTPPIR"       "SRNCCAK"      "CEDFGQML"     "NMDENDIEA"    "XGDMTICLVP"
[6] "RGTNYTHHQIG"  "KLSEPXIWRPCN"
```

generate FASTA formats for these sequences

```
cat(paste(">id",6:12,"\n",answer,sep=""), sep="\n")
```

```
>id6
TTPPIR
>id7
SRNCCAK
>id8
CEDFGQML
>id9
NMDENDIEA
>id10
XGDMTICLVP
>id11
RGTNYTHHQIG
>id12
KLSEPXIWRPCN
```