Username: 44373082

name of the public repository: ACST_s1_2019

File name: ACST890 quiz2

12.1

Downloading 44373082.pem via students email

Opening git bash

Using cd ~/desktop/ACST890 to change the path

```
yoga@Lenovo-PC MINGW64 ~/Desktop
$ cd ~/desktop/ACST890quiz2
```

Using ssh -i 44373082.pem
ubuntu@ec2-13-54-157-132.ap-southeast-2.compute.amazonaws.com ,
 crul
https://www.staff.hs-mittweida.de/~wuenschi/data/media/compbiolbook/chapter-
11-regex--structure.pdb > structure.pdb to download structure.pdb to AWS account
and named structure.pdb

```
yoga@Lenovo-PC MINGW64 ~/desktop/ACST890quiz2
$ ssh -i 44373082.pem ubuntu@ec2-13-54-157-132.ap-southeast-2.compute.amazonaws.
com
Welcome to Ubuntu 18.04.2 LTS (GNU/Linux 4.15.0-1032-aws x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Thu May  2 01:06:09 UTC 2019

  System load:  0.0               Processes:           88
  Usage of /:   27.0% of 7.69GB   Users logged in:     0
  Memory usage: 23%               IP address for eth0: 172.31.24.136
  Swap usage:   0%

 * Ubuntu's Kubernetes 1.14 distributions can bypass Docker and use containerd
   directly, see https://bit.ly/ubuntu-containerd or try it now with

     snap install microk8s --classic

  Get cloud support with Ubuntu Advantage Cloud Guest:
    http://www.ubuntu.com/business/services/cloud

 * Canonical Livepatch is available for installation.
   - Reduce system reboots and improve kernel security. Activate at:
     https://ubuntu.com/livepatch

73 packages can be updated.
0 updates are security updates.


*** System restart required ***
Last login: Thu Apr  4 11:01:10 2019 from 58.173.144.119
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
```

```
ubuntu@ip-172-31-24-136:~$ curl https://www.staff.hs-mittweida.de/~wuenschi/data
/media/compbiolbook/chapter-11-regex--structure.pdb
HEADER    Hydrogenase                          23-Mar-99    1CFZ
COMPND    Hydrogenase Maturating Endopeptidase Hybd From
SOURCE    ORGANISM_SCIENTIFIC: Escherichia coli
AUTHOR    Fritsche, Paschos, Beisel, Boeck & Huber
REMARK NCBI PDB FORMAT VERSION 5.0
SEQRES 1 A   162   MET ARG ILE LEU VAL LEU GLY VAL GLY ASN
SEQRES 2 A   162   THR ASP GLU ALA ILE GLY VAL ARG ILE VAL
SEQRES 3 A   162   GLU GLN ARG TYR ILE LEU PRO ASP TYR VAL
SEQRES 4 A   162   ASP GLY GLY THR ALA GLY MET GLU LEU LEU
HELIX  1 hel ILE A    18   GLN A    28
HELIX  2 hel PRO A    92   THR A   107
HELIX  3 hel ILE A   138   SER A   152
SHEET  1 str ARG A     2   ASN A    10
SHEET  2 str ARG A    29   LEU A    32
SHEET  3 str TYR A    35   THR A    43
ATOM 1   C   MET A 1 48.865   25.394   51.393  1.00 54.58 C
ATOM 2   CA  MET A 1 49.879   24.359   50.932  1.00 59.61 C
ATOM 3   CB  MET A 1 49.248   23.457   49.877  1.00 62.37 C
ATOM 4   CE  MET A 1 51.349   24.403   47.765  1.00 71.39 C
ATOM 5   CG  MET A 1 48.708   24.106   48.629  1.00 66.70 C
ATOM 6   N   MET A 1 50.347   23.578   52.116  1.00 62.03 N
ATOM 7   O   MET A 1 47.875   25.011   52.020  1.00 54.99 O
ATOM 8   SD  MET A 1 49.731   23.948   47.163  1.00 77.15 S
```

```
ubuntu@ip-172-31-24-136:~$ curl https://www.staff.hs-mittweida.de/~wuenschi/data
/media/compbiolbook/chapter-11-regex--structure.pdb > structure.pdb
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
                                 Dload  Upload   Total   Spent    Left  Speed
100  1140  100  1140    0     0    825      0  0:00:01  0:00:01 --:--:--   825
```

Using sed 's/Beisel/Weisel/g' structure.pdb change Beisel to Weisel

```
ubuntu@ip-172-31-24-136:~$ sed 's/Beisel/Weisel/g' structure.pdb
HEADER    Hydrogenase                          23-Mar-99    1CFZ
COMPND    Hydrogenase Maturating Endopeptidase Hybd From
SOURCE    ORGANISM_SCIENTIFIC: Escherichia coli
AUTHOR    Fritsche, Paschos, Weisel, Boeck & Huber
REMARK NCBI PDB FORMAT VERSION 5.0
SEQRES 1 A   162   MET ARG ILE LEU VAL LEU GLY VAL GLY ASN
```

12.2

Using sed '1,3d' structure.pdb to delete the first three lines

```
ubuntu@ip-172-31-24-136:~$ sed '1,3d' structure.pdb
AUTHOR    Fritsche, Paschos, Beisel, Boeck & Huber
REMARK NCBI PDB FORMAT VERSION 5.0
SEQRES 1 A   162   MET ARG ILE LEU VAL LEU GLY VAL GLY ASN
SEQRES 2 A   162   THR ASP GLU ALA ILE GLY VAL ARG ILE VAL
SEQRES 3 A   162   GLU GLN ARG TYR ILE LEU PRO ASP TYR VAL
SEQRES 4 A   162   ASP GLY GLY THR ALA GLY MET GLU LEU LEU
HELIX  1 hel ILE A    18   GLN A    28
HELIX  2 hel PRO A    92   THR A   107
HELIX  3 hel ILE A   138   SER A   152
SHEET  1 str ARG A     2   ASN A    10
SHEET  2 str ARG A    29   LEU A    32
SHEET  3 str TYR A    35   THR A    43
ATOM 1   C   MET A 1 48.865   25.394   51.393  1.00 54.58 C
ATOM 2   CA  MET A 1 49.879   24.359   50.932  1.00 59.61 C
ATOM 3   CB  MET A 1 49.248   23.457   49.877  1.00 62.37 C
ATOM 4   CE  MET A 1 51.349   24.403   47.765  1.00 71.39 C
ATOM 5   CG  MET A 1 48.708   24.106   48.629  1.00 66.70 C
ATOM 6   N   MET A 1 50.347   23.578   52.116  1.00 62.03 N
ATOM 7   O   MET A 1 47.875   25.011   52.020  1.00 54.99 O
ATOM 8   SD  MET A 1 49.731   23.948   47.163  1.00 77.15 S
```

12.3

Using sed -n '5,10p' structure.pdb to print only lines 5 through 10

```
ubuntu@ip-172-31-24-136:~$ sed -n '5,10p' structure.pdb
REMARK NCBI PDB FORMAT VERSION 5.0
SEQRES 1 A   162   MET ARG ILE LEU VAL LEU GLY VAL GLY ASN
SEQRES 2 A   162   THR ASP GLU ALA ILE GLY VAL ARG ILE VAL
SEQRES 3 A   162   GLU GLN ARG TYR ILE LEU PRO ASP TYR VAL
SEQRES 4 A   162   ASP GLY GLY THR ALA GLY MET GLU LEU LEU
HELIX  1 hel ILE A    18   GLN A    28
```

12.4

Using sed '/MET/d' structure.pdb to delete lines containing the word MET

```
ubuntu@ip-172-31-24-136:~$ sed '/MET/d' structure.pdb
HEADER  Hydrogenase                        23-Mar-99   1CFZ
COMPND  Hydrogenase Maturating Endopeptidase Hybd From
SOURCE  ORGANISM_SCIENTIFIC: Escherichia coli
AUTHOR  Fritsche, Paschos, Beisel, Boeck & Huber
REMARK NCBI PDB FORMAT VERSION 5.0
SEQRES 2 A  162   THR ASP GLU ALA ILE GLY VAL ARG ILE VAL
SEQRES 3 A  162   GLU GLN ARG TYR ILE LEU PRO ASP TYR VAL
HELIX  1 hel ILE A   18  GLN A   28
HELIX  2 hel PRO A   92  THR A  107
HELIX  3 hel ILE A  138  SER A  152
SHEET  1 str ARG A    2  ASN A   10
SHEET  2 str ARG A   29  LEU A   32
SHEET  3 str TYR A   35  THR A   43
```

12.5

Using -n '/HELIX/{/ILE/p}' structure.pdb to print all lines where the HELIX line contains
the word ILE

```
ubuntu@ip-172-31-24-136:~$ sed -n '/HELIX/{/ILE/p}' structure.pdb
HELIX  1 hel ILE A   18  GLN A   28
HELIX  3 hel ILE A  138  SER A  152
```

12.6

Using sed '/^H/s/$/***/' structure.pdb to append three stars to the end of lines starting
with "H"

```
ubuntu@ip-172-31-24-136:~$ sed '/^H/s/$/***/' structure.pdb
HEADER  Hydrogenase                        23-Mar-99   1CFZ***
COMPND  Hydrogenase Maturating Endopeptidase Hybd From
SOURCE  ORGANISM_SCIENTIFIC: Escherichia coli
AUTHOR  Fritsche, Paschos, Beisel, Boeck & Huber
REMARK NCBI PDB FORMAT VERSION 5.0
SEQRES 1 A  162   MET ARG ILE LEU VAL LEU GLY VAL GLY ASN
SEQRES 2 A  162   THR ASP GLU ALA ILE GLY VAL ARG ILE VAL
SEQRES 3 A  162   GLU GLN ARG TYR ILE LEU PRO ASP TYR VAL
SEQRES 4 A  162   ASP GLY GLY THR ALA GLY MET GLU LEU LEU
HELIX  1 hel ILE A   18  GLN A   28***
HELIX  2 hel PRO A   92  THR A  107***
HELIX  3 hel ILE A  138  SER A  152***
SHEET  1 str ARG A    2  ASN A   10
SHEET  2 str ARG A   29  LEU A   32
SHEET  3 str TYR A   35  THR A   43
ATOM 1   C   MET A 1 48.865  25.394  51.393  1.00 54.58 C
ATOM 2   CA  MET A 1 49.879  24.359  50.932  1.00 59.61 C
ATOM 3   CB  MET A 1 49.248  23.457  49.877  1.00 62.37 C
ATOM 4   CE  MET A 1 51.349  24.403  47.765  1.00 71.39 C
ATOM 5   CG  MET A 1 48.708  24.106  48.629  1.00 66.70 C
ATOM 6   N   MET A 1 50.347  23.578  52.116  1.00 62.03 N
ATOM 7   O   MET A 1 47.875  25.011  52.020  1.00 54.99 O
ATOM 8   SD  MET A 1 49.731  23.948  47.163  1.00 77.15 S
```

12.7

Using sed '/SEQRES/c SEQ' structure.pdb to replace the line containing SEQRES with SEQ

```
ubuntu@ip-172-31-24-136:~$ sed '/SEQRES/c SEQ' structure.p
HEADER    Hydrogenase                          23-Mar-99    1CFZ
COMPND    Hydrogenase Maturating Endopeptidase Hybd From
SOURCE    ORGANISM_SCIENTIFIC: Escherichia coli
AUTHOR    Fritsche, Paschos, Beisel, Boeck & Huber
REMARK NCBI PDB FORMAT VERSION 5.0
SEQ
SEQ
SEQ
SEQ
HELIX  1 hel ILE A   18  GLN A   28
HELIX  2 hel PRO A   92  THR A  107
HELIX  3 hel ILE A  138  SER A  152
SHEET  1 str ARG A    2  ASN A  10
SHEET  2 str ARG A   29  LEU A  32
SHEET  3 str TYR A   35  THR A  43
ATOM 1   C    MET A 1 48.865   25.394   51.393   1.00 54.58 C
ATOM 2   CA   MET A 1 49.879   24.359   50.932   1.00 59.61 C
ATOM 3   CB   MET A 1 49.248   23.457   49.877   1.00 62.37 C
ATOM 4   CE   MET A 1 51.349   24.403   47.765   1.00 71.39 C
ATOM 5   CG   MET A 1 48.708   24.106   48.629   1.00 66.70 C
ATOM 6   N    MET A 1 50.347   23.578   52.116   1.00 62.03 N
ATOM 7   O    MET A 1 47.875   25.011   52.020   1.00 54.99 O
ATOM 8   SD   MET A 1 49.731   23.948   47.163   1.00 77.15 S
```

12.8

Downloading jabberwocky.txt via ilearn

Opening git bash

Using cd ~/desktop/ACST890 to change the path

```
yoga@Lenovo-PC MINGW64 ~/Desktop
$ cd ~/desktop/ACST890quiz2
```

Using scp -i 44373082.pem jabberwocky.txt

ubuntu@ec2-13-54-157-132.ap-southeast-2.compute.amazonaws.com   ,

ssh -i 44373082.pem

ubuntu@ec2-13-54-157-132.ap-southeast-2.compute.amazonaws.com to add

jabberwocky to AWS account.

Using `sed '/^\s*$/d' jabberwocky.txt` to delete all blank line

```
ubuntu@ip-172-31-24-136:~$ sed '/^\s*$/d' jabberwocky.txt
-----------------------------------------------------------
`Twas brillig, and the slithy toves
Did gyre and gimble in the wabe:
All mimsy were the borogoves,
And the mome raths outgrabe.
-----------------------------------------------------------
"Beware the Jabberwock, my son!
The jaws that bite, the claws that catch!
Beware the Jubjub bird, and shun
The frumious Bandersnatch!"
-----------------------------------------------------------
He took his vorpal sword in hand:
Long time the manxome foe he sought
So rested he by the Tumtum tree,
And stood awhile in thought.
-----------------------------------------------------------
And, as in uffish thought he stood,
The Jabberwock, with eyes of flame,
Came whiffling through the tulgey wood,
And burbled as it came!
-----------------------------------------------------------
One, two! One, two! And through and through
The vorpal blade went snicker-snack!
He left it dead, and with its head
He went galumphing back.
-----------------------------------------------------------
"And, has thou slain the Jabberwock?
Come to my arms, my beamish boy!
O frabjous day! Callooh! Callay!'
He chortled in his joy.
-----------------------------------------------------------
`Twas brillig, and the slithy toves
Did gyre and gimble in the wabe;
All mimsy were the borogoves,
And the mome raths outgrabe.
-----------------------------------------------------------
ubuntu@ip-172-31-24-136:~$ 
```