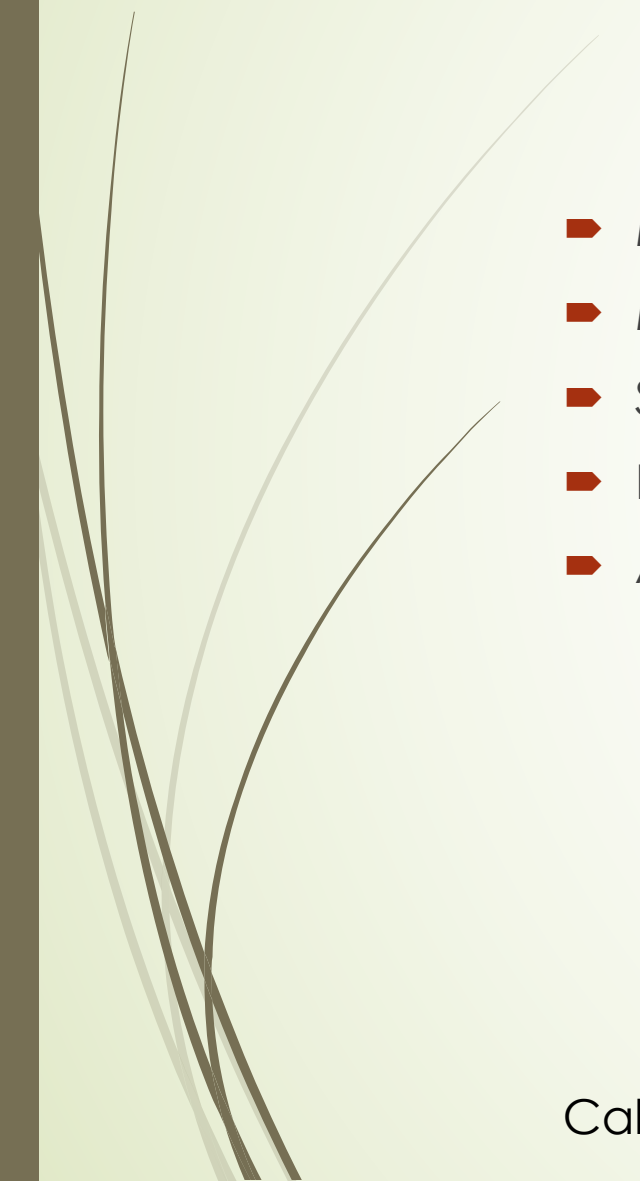# BASH FOR THE VIRTUOUS

where our hero discovers *the virtuous cycle*
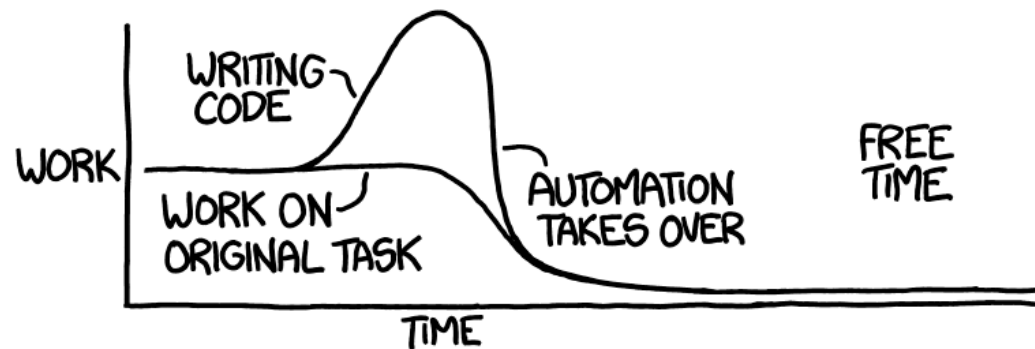
Ok, why automate

- Making a task as frictionless as possible allows you to keep in Flow
- Most people underestimate how many times they will do a task
- Saving time leads to a virtuous cycle
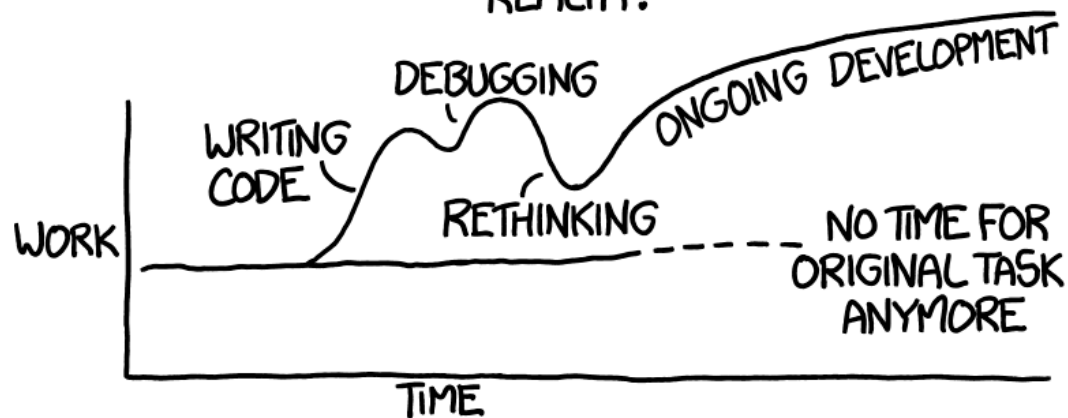- Reduces mistakes…generally
- About time…

Call me #Ishmael

Before we begin… make life easier with tab completion

- Get a terminal window open preferable on the cluster
- Type in $ so [hit the tab twice]
- You should see all of the commands that start with so:
- Now type an **r** [hit the tab once]
- It should complete the command and give you:
  - sort
- type ls ~/virtuous_bash/mis [hit tab once]
  - It will complete the directory to ~/virtuous_bash/misnamed_files/

The #sun shone, having no alternative, on the nothing new.

Life easier with… bash editing shortcuts

- Type: $ do ri me fa sol la ti (or any nonsense consisting of multiple words)
- Use alt left key and alt right key on the mac to move between words
  - On other systems, you can also try ALT +f and ALT+b
- Move the cursor to the end of the line with CTRL+e
- Move the cursor to the beginning of the line with CTRL+a
- Type CTRL-c to clear

Bash Profile - Basics

- The bash profile you will want to edit in command line osX is .bash_profile, .bash_login, or .profile.

- The bash profile you will want to edit on the clusters is.bash_profile

- You must reboot for the profile to take effect

Dr. Weiss, at #forty, knew that her life had been ruined by literature.

Aliases

- Aliases allow you to tie a command to a different command string

- I use this to make ssh into longleaf quicker

  alias longleaf="ssh -X paulcotn@longleaf.unc.edu"

- By typing in the command $ longleaf, I log into longleaf

- Other good commands would be:

alias pine="~/pine/scr/p/a/paulcotn"
alias dor = 'srun --mem 40G --pty R'
alias showqueue='squeue -u YOUR_ONYEN -O JobID:8,PARTITION:10,name:30,state:10,REASON'

Rule of thumb

- When the command is **long**

- You do it a **lot**

- You aren't realistically going to **remember** it

Time is not a line but a dimension, like the dimensions of space.

Practice

- Type in
  - $ **alias** ltr="ls -ltr"
- Run the command ltr in any directory
- You should now have a list of files in the long format with the latest files at the bottom.
- To see the list of aliases type:
  - $ alias
- To see remove the alias type:
  - $ unalias ltr
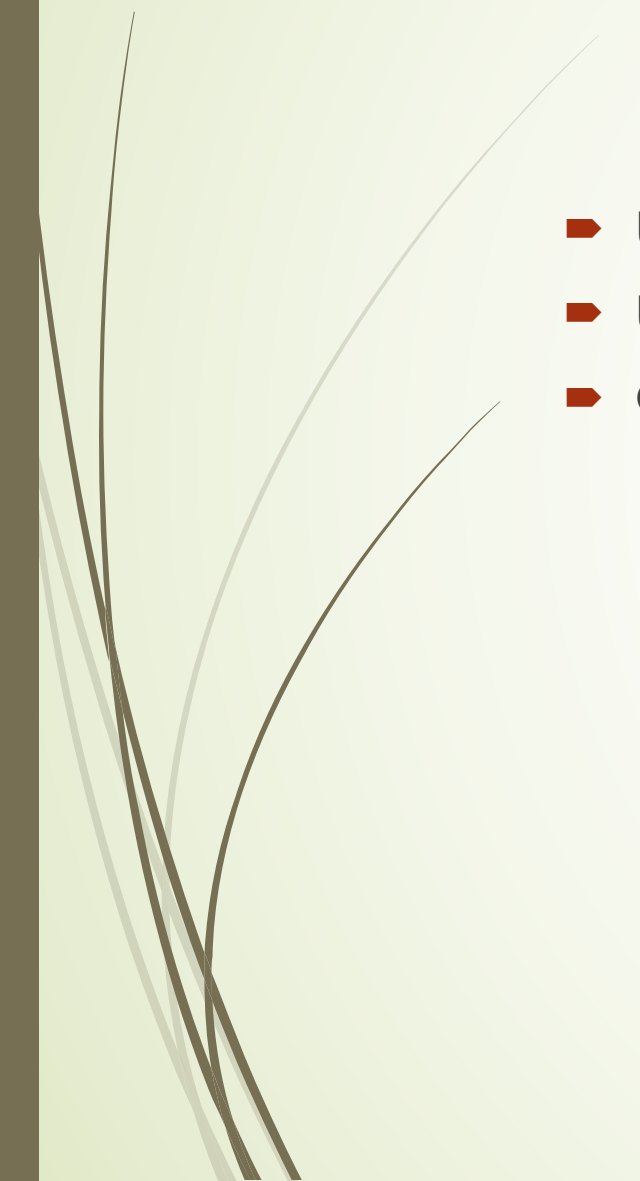
Functions in bash profiles

- Functions can work like aliases except you can pass parameters
  - Functions can be more powerful than that…
- A typical function
  - function xferll () { rsync -vac "$1" paulcotn@longleaf.unc.edu:/pine/scr/p/a/paulcotn; }
  - $ xferll .profile
    - Transfer a file or directory to my scratch space on longleaf
  - function search () { egrep -roil $1 . | sort | uniq; }
  - $ search "Mary's Lamb"
    - Find files that have the string in them

Alias vs Function

- Use an alias when you **don't need** to pass a variable unless it is at the end
- Use a function when you **do need** to pass a variable
- OR you want to do something more sophisticated

The Path

- Another really common change made in the profile is the path.
- If you open up, your .bash_profile or .profile now you will probably see a PATH being set. My cluster environment Path is set this way:
  - export PATH=$PATH:$HOME/.local/bin:$HOME/bin
- With this anything in the ~/.local/bin or the ~/bin can be called from anywhere
- Why would we do this…

Write your own scripts

- As you progress though life, you will probably find or in fact write your own scripts to extend what the environment can do.

- I am actually going to show one of the most helpful scripts I have ever found… with a caveat.

Practice

- First lets change the path temporarily:

  ```
  $ export PATH=$PATH:$HOME/virtuous_bash/bin
  ```
- Type in:

  ```
  $ which renamepl
  /Users/paul/virtuous_bash/bin/renamepl
  ```
- Open up the file ~/virtuous_bash/bin/renamepl in your favorite text editor

```perl
#!/usr/bin/perl
#
# Usage: rename perlexpr [files]


($regexp = shift @ARGV) || die "Usage:  rename perlexpr
[filenames]\n";


if (!@ARGV) {
    @ARGV = <STDIN>;
    chomp(@ARGV);
}



foreach $_ (@ARGV) {
    $old_name = $_;
    eval $regexp;
    die $@ if $@;
    rename($old_name, $_) unless $old_name eq $_;
}


exit(0);
```

Practice

◗ Type in:

$ ls –1 ~/virtuous_bash/misnamed_files/

◗ Looking at the directory you should see something like this:

```
FureyLab-JMS-iMac:misnamed_files paul$ ls -1
~/virtuous_bash/misnamed_files/
outBD_ChIP_H3K27me3_106_kidney.txt
outCHIPKID106-CTL_ChIP_106_kidney_GTGAAA_L002_R1_001.txt
outCHIPKID4-CTL_ChIP_K27ac_4_kidney_ACAGTG_L006_R1_001.txt
outCHIPKID4-CTL_ChIP_K27ac_4_kidney_ACAGTG_L008_R1_001.txt
outCHIPKID6-CTL_ChIP_6_kidney_v2_AGTTCC_L005_R1_001.txt
```

OOPS... The files **should not have** the out at the beginning, and should have the fastq extension and not the txt extension

Practice

- Type in

$ renamepl 's/out(.*)\.txt/\1.fastq/' ~/virtuous_bash/misnamed_files/*

- This should correct all of the files in that directory such that…

```
FureyLab-JMS-iMac:~ paul$ ls -1 ~/virtuous_bash/misnamed_files/
BD_ChIP_H3K27me3_106_kidney.fastq
CHIPKID106-CTL_ChIP_106_kidney_GTGAAA_L002_R1_001.fastq
CHIPKID4-CTL_ChIP_K27ac_4_kidney_ACAGTG_L006_R1_001.fastq
CHIPKID4-CTL_ChIP_K27ac_4_kidney_ACAGTG_L008_R1_001.fastq
CHIPKID6-CTL_ChIP_6_kidney_v2_AGTTCC_L005_R1_001.fastq
```

OK! Now the files look like what I want them to be!!!!

How did that work exactly?

- Rename takes a perl regular expression:
  - In our case : s/out(.*)\.txt/\1.fastq/
- And applied it to the files we gave it.
- The regex above says take all of the files that start with **out** and ends with **.txt** rename them such that the out is stripped and the **.txt** is changed to **.fastq**

The other rename

- Ok there is a caveot…

- Some systems where Perl is installed will have a more powerful rename command installed called rename.

- Also, some version of Linux will have a less flexible rename tool called well rename. The longleaf cluster has this one.

Practice

- Type in
  - $ ls ~/virtuous_bash/no_leading_zero
- Take a look at the file names and note none of them having leading zeros:
  - file1.txt, file2.txt, … file19.txt, file20.txt
- I want to rename the files to have leading zeros:
  - file01.txt, file02.txt, … file19.txt, file20.txt

If you are on longleaf

- Now type:
  - $ rename file file0 ~/virtuous_bash/no_leading_zero/file?.txt
- Now type:
  - $ ls ~/virtuous_bash/no_leading_zero/
- You should see names with leading zeros.

Regex give renamepl a lot of flexibilty

- To change files in this pattern: 01-paul.txt 04-clock.txt

- To this pattern: paul-01.txt clock-04.txt

- $renamepl 's/(\d+)-(.*)(.txt)/\2-\1\3/' *.txt

- As long as you know the syntax for Perl regex than you can rename long lists of files easily

An example of why regex is useful to know

- For this next set of slides I am going to be work in BBedit and Sublime Text
- If you are using a different text editor we may have to work a bit to do these examples.
- Any text editor will do this as long as you have regex find and replace.
- The syntax however can be different

The problem

- I have a list of fastq file names in the /proj/fureylab area.

- I want to run these files through the pipeline by changing each line, which contains a filename into a three lines of commands.

- The list of fastq files are long.

Miss Brooke had that kind of beauty which seems to be thrown into relief by poor #dress.

/proj/fureylab/data/ATAC/mouse/C57BL6/CTL_kidney/BD_ATAC_5_kidney/fastq/ATAC_BD_10-BD_ATAC_5_kidney_re_AGGCAGA_L004_R1_001.fastq.gz

mkdir -p $TMP_DIR/ATAC_BD_10-BD_ATAC_5_kidney_re_AGGCAGA_L004_R1_00

cd $TMP_DIR/ATAC_BD_10-BD_ATAC_5_kidney_re_AGGCAGA_L004_R1_001

python atac_v_1_1.py --out-dir /proj/fureylab/data/ATAC/mouse/C57BL6/CTL_kidney/BD_ATAC_5_kidney/out2/ --tmp-dir $TMP_DIR/ATAC_BD_10-BD_ATAC_5_kidney_re_AGGCAGA_L004_R1_001/tmp --group-name ATAC_BD_10-BD_ATAC_5_kidney_re_AGGCAGA_L004_R1_001 --max-nhits 1 --config config.cfg --slurm --section C57BL6 --run /proj/fureylab/data/ATAC/mouse/C57BL6/CTL_kidney/BD_ATAC_5_kidney/fastq/ATAC_BD_10-BD_ATAC_5_kidney_re_AGGCAGA_L004_R1_001.fastq.gz

Breakdown the first two lines

- First thing first I want to create a directory off of $TMP_DIR with the base name of the original file

- **ATAC_BD_10-BD_ATAC_5_kidney_re_AGGCAGA_L004_R1_001**.fastq.gz

- mkdir $TMP_DIR/**ATAC_BD_10-BD_ATAC_5_kidney_re_AGGCAGA_L004_R1_001**

- cd $TMP_DIR/**ATAC_BD_10-BD_ATAC_5_kidney_re_AGGCAGA_L004_R1_001**

The third line -\1

- Ok this is the tricky bit so lets break the third line down to this format

- python atac_v_1_1.py --out-dir **\1** --tmp-dir **\2** –group-name **\3** --max-nhits 1 –config config.cfg --slurm --section C57BL6 –run **\4**

- Where

  - \1 is the name of the directory UNDER the fastq directory in the name script with an out2 appended

/proj/fureylab/data/ATAC/mouse/C57BL6/CTL_kidney/BD_ATAC_5_kidney/fastq/ATAC_BD_10-BD_ATAC_5_kidney_re_AGGCAGA_L004_R1_001.fastq.gz

/proj/fureylab/data/ATAC/mouse/C57BL6/CTL_kidney/BD_ATAC_5_kidney/out2

The third line -\2

- python atac_v_1_1.py --out-dir **\1** --tmp-dir **\2** –group-name **\3** --max-nhits 1 –config config.cfg --slurm --section C57BL6 –run **\4**

- Where

  - \2 is $TMP_DIR/**[BASENAME]** /tmp

ATAC_BD_10-BD_ATAC_5_kidney_re_AGGCAGA_L004_R1_001.fastq.gz

$TMP_DIR/**ATAC_BD_10-BD_ATAC_5_kidney_re_AGGCAGA_L004_R1_001**/tmp

The third line \3

- python atac_v_1_1.py --out-dir **\1** --tmp-dir **\2** –group-name **\3** --max-nhits 1 –config config.cfg --slurm --section C57BL6 –run **\4**

- \3 is just the base name

ATAC_BD_10-BD_ATAC_5_kidney_re_AGGCAGA_L004_R1_001.fastq.gz

ATAC_BD_10-BD_ATAC_5_kidney_re_AGGCAGA_L004_R1_001

The third line \4

- python atac_v_1_1.py --out-dir **\1** --tmp-dir **\2** –group-name **\3** --max-nhits 1 –config config.cfg --slurm --section C57BL6 –run **\4**

- \4 is just the original file name

/proj/fureylab/data/ATAC/mouse/C57BL6/CTL_kidney/BD_ATAC_5_kidney/fastq/ATAC_BD_10-BD_ATAC_5_kidney_re_AGGCAGA_L004_R1_001.fastq.gz

Two step process: Step 1

- I am now going to take the text file and produce a line for every filename into 3 columns:

- Column 1 is the name of the directory UNDER the fastq directory in the name script with an out2 appended **(\1 in the previous)**

- Column 2 is just the base name **(\2 in the previous)**

- Column 3 is just the original name **(\4 in the previous)**

The past is a foreign #country; they do things differently there.

Open the file:
 ~/virtuous_bash/CAST_rerun/source.txt

Currently Open Documents

- ATAC_C57BL6_DO.txt
- ATAC_C57BL6_SCRATCH.txt
- ATAC_C57BL6_SKIP.txt
- ATAC_C57BL6.sh
- ATAC_C57BL6.txt
- ATAC_CAST_SCRATCH.txt
- ATAC_CAST_TERRY.sh
- ATAC_CAST.bash
- ATAC_CAST.sh
- ATAC_CAST.txt
- automation2017_09_02.txt
- Awk example.txt
- ChIP.sh
- ChIP.txt
- dbGap_notes.txt
- untitled text 15
- untitled text 21
- NovelFirstLines.txt
- untitled text 26
- untitled text 27
- source.txt
- five_columns.txt

~/virtous_bash/CAST_rerun.txt/source.txt

```
1   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_105_kidney/fastq/Kidney_105_ATAC.fastq.gz
2   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_101_kidney/fastq/CAST_CTL_kidney_ATAC_101_cat012016.fastq
3   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_104_kidney/fastq/Kidney_104_ATAC.fastq.gz
4   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_103_kidney/fastq/Kidney_103_ATAC.fastq.gz
5   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_2_kidney/fastq/ATACKID2-BD_ATAC_2_kidney_CGTACTA_R1_001.f
6   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_102_kidney/fastq/ATACKD102-BD_ATAC_102_kidney_cat_060315.
7   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_1_kidney/fastq/ATAC_BD_1-BD_ATAC_1_kidney_re_TAAGGCG_L002
8   /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_8_liver/fastq/CAST_BD_liver_ATAC_8_cat091516.fastq.gz
9   /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_8_liver/fastq/CAST_BD_liver_ATAC_8_cat012016.fastq.gz
10  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_10_liver/fastq/ATAC_BD_5-BD_ATAC_10_liver_re_GGACTCC_L002_R
11  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_7_liver/fastq/CAST_BD_liver_ATAC_7_cat012016.fastq.gz
12  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_11_liver/fastq/ATAC_BD_30-BD_ATAC_11_liver_re_CTCTCTA_L008_
13  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_9_liver/fastq/CAST_BD_liver_ATAC_9_cat012016.fastq.gz
14  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_12_liver/fastq/ATAC_BD_15-BD_ATAC_12_liver_re_CAGAGAG_L004_
15  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_103_lung/fastq/Lung_103_ATAC.fastq.gz
16  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_104_lung/fastq/Lung_104_ATAC.fastq.gz
17  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_2_lung/fastq/Lung_2_ATAC.fastq.gz
18  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_1_lung/fastq/ATACLU1-BD_ATAC_1_lung_cat.fastq.gz
19  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_105_lung/fastq/Lung_105_ATAC.fastq.gz
20  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_101_lung/fastq/Lung_101_ATAC.fastq.gz
21  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_102_lung/fastq/Lung_102_ATAC.fastq.gz
22  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_8_lung/fastq/Lung_8_ATAC.fastq.gz
23  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_9_lung/fastq/Lung_9_ATAC.fastq.gz
24  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_7_lung/fastq/ATACLU7-BD_ATAC_7_lung_cat.fastq.gz
25  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_11_lung/fastq/Lung_11_ATAC.fastq.gz
26  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_12_lung/fastq/Lung_12_ATAC.fastq.gz
27  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_10_lung/fastq/Lung_10_ATAC.fastq.gz
28  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_1_liver/fastq/ATAC_BD_16-BD_ATAC_1_liver_re_TAAGGCG_L005_R
29  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_105_liver/fastq/Liver_105_ATAC.fastq.gz
30  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_102_liver/fastq/Liver_102_ATAC.fastq.gz
31  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_104_liver/fastq/Liver_104_ATAC.fastq.gz
32  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_2_liver/fastq/ATAC_BD_17-BD_ATAC_2_liver_re_CGTACTA_L006_R
33  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_103_liver/fastq/Liver_103_ATAC.fastq.gz
34  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_101_liver/fastq/Liver_101_ATAC.fastq.gz
35  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_7_kidney/fastq/ATACKID7-BD_ATAC_7_kidney_cat_060315.fastq.
36  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_12_kidney/fastq/ATACKID12-BD_ATAC_12_2ndPrep_kidney_AGGCAG
37  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_9_kidney/fastq/ATAC_BD_20-BD_ATAC_9_kidney_re_GGACTCC_L006_
38  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_8_kidney/fastq/ATAC_BD_11-BD_ATAC_8_kidney_re_TCCTGAG_L003
39  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_11_kidney/fastq/ATAC_BD_27-BD_ATAC_11_kidney_re_TCCTGAG_L0
40  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_10_kidney/fastq/CAST_BD_kidney_ATAC_10_cat012016.fastq.gz
```

TEXTWRANGLER
OR
BBEDIT

Now bring up the find and replace window (META KEY)+F

Currently Open Documents

⚙ ~/virtous_bash/CAST_rerun.txt/source.txt ▾

- ATAC_C57BL6_DO.txt
- ATAC_C57BL6_SCRATCH.txt
- ATAC_C57BL6_SKIP.txt
- ATAC_C57BL6.sh
- ATAC_C57BL6.txt
- ATAC_CAST_SCRATCH.t
- ATAC_CAST_TERRY.sh
- ATAC_CAST.bash
- ATAC_CAST.sh
- ATAC_CAST.txt
- automation2017_09_02.
- Awk example.txt
- ChIP.sh
- ChIP.txt
- dbGap_notes.txt
- untitled text 15
- untitled text 21
- NovelFirstLines.txt
- untitled text 26
- untitled text 27
- source.txt
- five_columns.txt

```
1   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_105_kidney/fastq/Kidney_105_ATAC.fastq.gz
2   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_101_kidney/fastq/CAST_CTL_kidney_ATAC_101_cat012016.fastq
3   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_104_kidney/fastq/Kidney_104_ATAC.fastq.gz
```

Find

Find: `^(.*/)(fastq/)(.*)(\.fastq\.gz)$`

Replace: `\1\t\3\t\1\2\3\4`

Matching: ☐ Case sensitive   ☐ Entire word   ☑ Grep
Search in: ☐ Selected text only   ☐ Wrap around

- Next
- Previous
- Find All
- Extract
- Replace
- Replace All
- Replace & Find

```
19  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_105_lung/fastq/Lung_105_ATAC.fastq.gz
20  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_101_lung/fastq/Lung_101_ATAC.fastq.gz
21  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_102_lung/fastq/Lung_102_ATAC.fastq.gz
22  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_8_lung/fastq/Lung_8_ATAC.fastq.gz
23  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_9_lung/fastq/Lung_9_ATAC.fastq.gz
24  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_7_lung/fastq/ATACLU7-BD_ATAC_7_lung_cat.fastq.gz
25  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_11_lung/fastq/Lung_11_ATAC.fastq.gz
26  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_12_lung/fastq/Lung_12_ATAC.fastq.gz
27  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_10_lung/fastq/Lung_10_ATAC.fastq.gz
28  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_1_liver/fastq/ATAC_BD_16-BD_ATAC_1_liver_re_TAAGGCG_L005_R
29  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_105_liver/fastq/Liver_105_ATAC.fastq.gz
30  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_102_liver/fastq/Liver_102_ATAC.fastq.gz
31  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_104_liver/fastq/Liver_104_ATAC.fastq.gz
32  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_2_liver/fastq/ATAC_BD_17-BD_ATAC_2_liver_re_CGTACTA_L006_R
33  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_103_liver/fastq/Liver_103_ATAC.fastq.gz
34  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_101_liver/fastq/Liver_101_ATAC.fastq.gz
35  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_7_kidney/fastq/ATACKID7-BD_ATAC_7_kidney_cat_060315.fastq.
36  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_12_kidney/fastq/ATACKID12-BD_ATAC_12_2ndPrep_kidney_AGGCAG
37  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_9_kidney/fastq/ATAC_BD_20-BD_ATAC_9_kidney_re_GGACTCC_L006
38  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_8_kidney/fastq/ATAC_BD_11-BD_ATAC_8_kidney_re_TCCTGAG_L003
39  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_11_kidney/fastq/ATAC_BD_27-BD_ATAC_11_kidney_re_TCCTGAG_L0
40  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_10_kidney/fastq/CAST_BD_kidney_ATAC_10_cat012016.fastq.gz
```

Type in the find window:

   ^(.*/)(fastq/)(.*)(\.fastq\.gz)$

Type in the replace window

   \1\t\3\t\1\2\3\4

Press **Replace All**

Currently Open Documents   ⚙ ~/virtous_bash/CAST_rerun.txt/five_columns.txt ▾

untitled text 21 ⊗

source.txt

five_columns.txt ⊗

```
1   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_105_kidney/   Kidney_105_ATAC /proj/fureylab/data/ATAC/mou
2   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_101_kidney/   CAST_CTL_kidney_ATAC_101_cat012016   /proj/fu
3   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_104_kidney/   Kidney_104_ATAC /proj/fureylab/data/ATAC/mou
4   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_103_kidney/   Kidney_103_ATAC /proj/fureylab/data/ATAC/mou
5   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_2_kidney/     ATACKID2-BD_ATAC_2_kidney_CGTACTA_R1_001
6   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_102_kidney/   ATACKD102-BD_ATAC_102_kidney_cat_060315 /pro
7   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_1_kidney/     ATAC_BD_1-BD_ATAC_1_kidney_re_TAAGGCG_L002_R
8   /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_8_liver/   CAST_BD_liver_ATAC_8_cat091516  /proj/fureylab/d
9   /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_8_liver/   CAST_BD_liver_ATAC_8_cat012016  /proj/fureylab/d
10  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_10_liver/  ATAC_BD_5-BD_ATAC_10_liver_re_GGACTCC_L002_R1_00
11  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_7_liver/   CAST_BD_liver_ATAC_7_cat012016  /proj/fureylab/d
12  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_11_liver/  ATAC_BD_30-BD_ATAC_11_liver_re_CTCTCTA_L008_R1_0
13  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_9_liver/   CAST_BD_liver_ATAC_9_cat012016  /proj/fureylab/d
14  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_12_liver/  ATAC_BD_15-BD_ATAC_12_liver_re_CAGAGAG_L004_R1_0
```

Find

Find: `^(.*/)(fastq/)(.*)(\.fastq\.gz)$`

Replace: `\1\t\3\t\1\2\3\4`

Matching: ☐ Case sensitive   ☐ Entire word   ☑ Grep

Search in: ☐ Selected text only   ☐ Wrap around

[Next] [Previous] [Find All] [Extract] [Replace] [Replace All] [Rep...ind] ⌥⌘=

```
31  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_104_liver/    Liver_104_ATAC  /proj/fureylab/data/ATAC/mou
32  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_2_liver/  ATAC_BD_17-BD_ATAC_2_liver_re_CGTACTA_L006_R1_00
33  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_103_liver/    Liver_103_ATAC  /proj/fureylab/data/ATAC/mou
34  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_101_liver/    Liver_101_ATAC  /proj/fureylab/data/ATAC/mou
35  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_7_kidney/ ATACKID7-BD_ATAC_7_kidney_cat_060315    /proj/fu
36  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_12_kidney/    ATACKID12-BD_ATAC_12_2ndPrep_kidney_AGGCAG_L
37  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_9_kidney/ ATAC_BD_20-BD_ATAC_9_kidney_re_GGACTCC_L006_R1_0
38  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_8_kidney/ ATAC_BD_11-BD_ATAC_8_kidney_re_TCCTGAG_L003_R1_0
39  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_11_kidney/    ATAC_BD_27-BD_ATAC_11_kidney_re_TCCTGAG_L008
40  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_10_kidney/    CAST_BD_kidney_ATAC_10_cat012016    /proj/fu
```
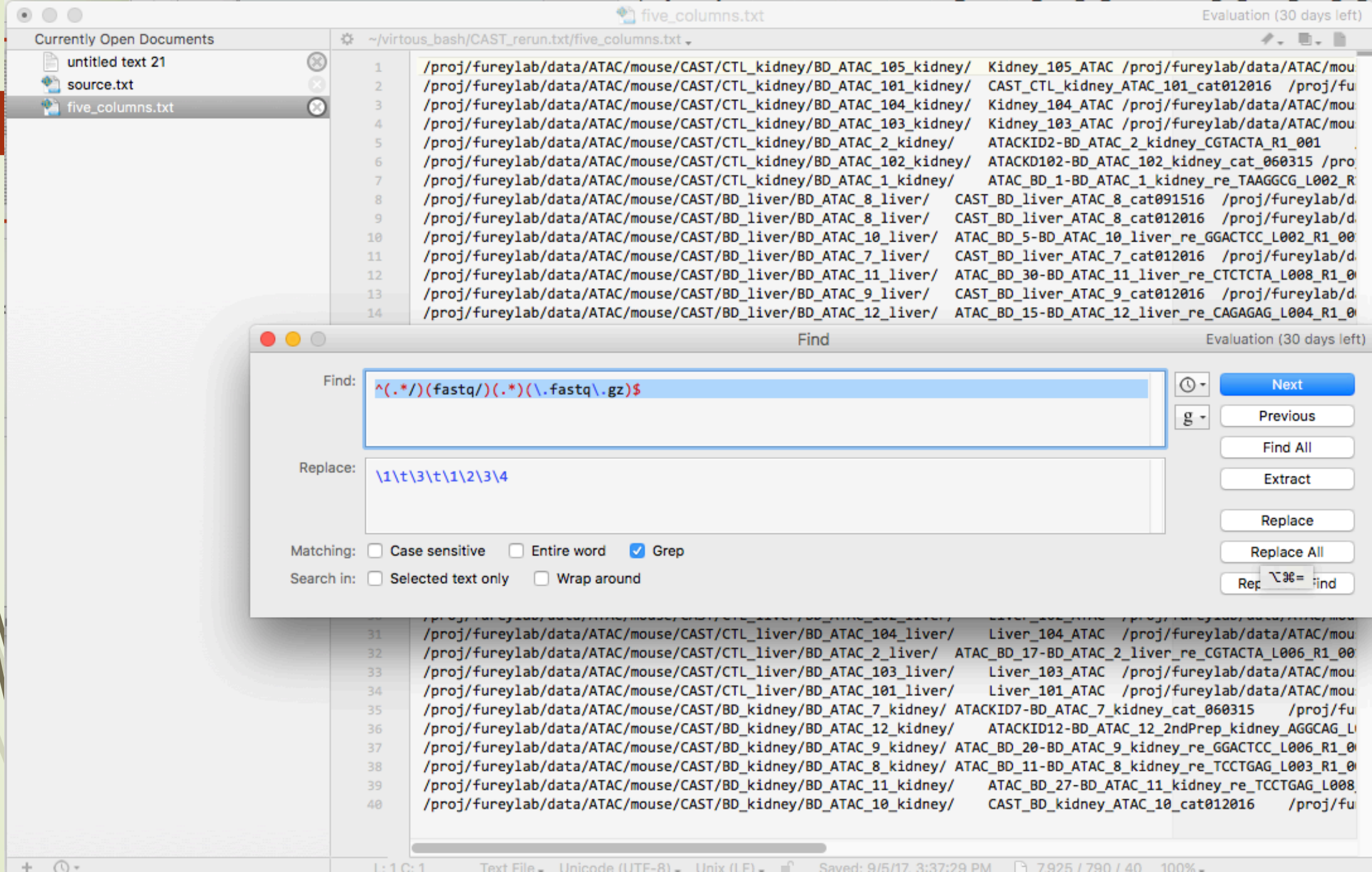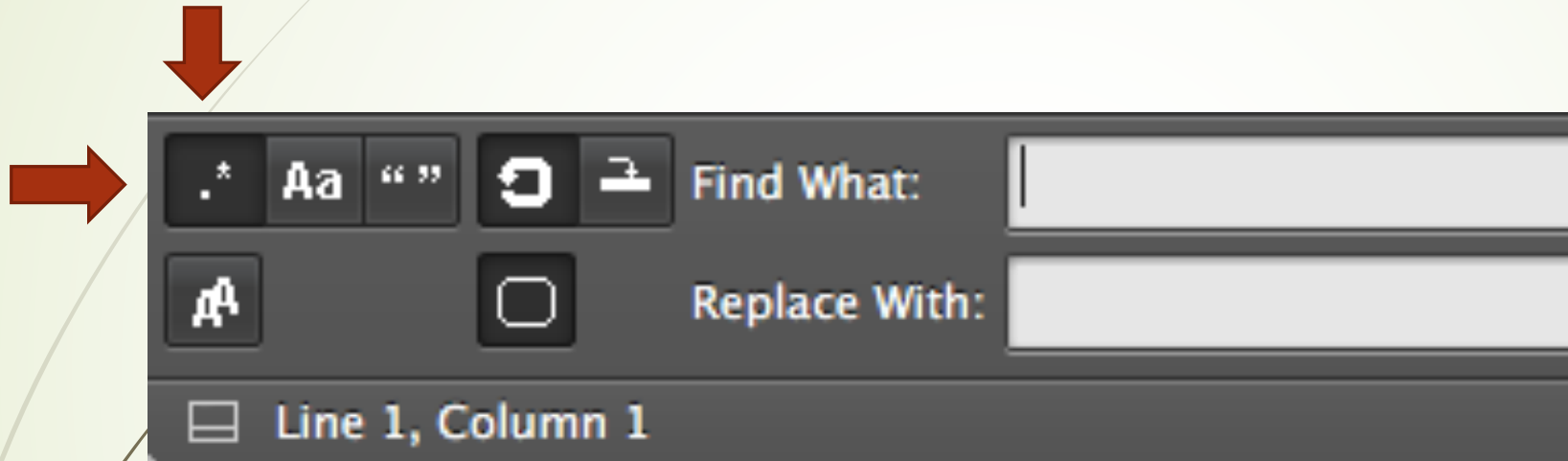
SUBLIME TEXT

Open the file:
 ~/virtuous_bash/CAST_rerun/source.txt

```
 1  /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_105_kidney/fastq/Kidney_105_ATAC.fastq.gz
 2  /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_101_kidney/fastq/CAST_CTL_kidney_ATAC_101_cat012016.fastq.gz
 3  /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_104_kidney/fastq/Kidney_104_ATAC.fastq.gz
 4  /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_103_kidney/fastq/Kidney_103_ATAC.fastq.gz
 5  /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_2_kidney/fastq/ATACKID2-BD_ATAC_2_kidney_CGTACTA_R1_001.fastq.gz
 6  /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_102_kidney/fastq/ATACKD102-BD_ATAC_102_kidney_cat_060315.fastq.gz
 7  /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_1_kidney/fastq/ATAC_BD_1-BD_ATAC_1_kidney_re_TAAGGCG_L002_R1_001.fastq.gz
 8  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_8_liver/fastq/CAST_BD_liver_ATAC_8_cat091516.fastq.gz
 9  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_8_liver/fastq/CAST_BD_liver_ATAC_8_cat012016.fastq.gz
10  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_10_liver/fastq/ATAC_BD_5-BD_ATAC_10_liver_re_GGACTCC_L002_R1_001.fastq.gz
11  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_7_liver/fastq/CAST_BD_liver_ATAC_7_cat012016.fastq.gz
12  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_11_liver/fastq/ATAC_BD_30-BD_ATAC_11_liver_re_CTCTCTA_L008_R1_001.fastq.gz
13  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_9_liver/fastq/CAST_BD_liver_ATAC_9_cat012016.fastq.gz
14  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_12_liver/fastq/ATAC_BD_15-BD_ATAC_12_liver_re_CAGAGAG_L004_R1_001.fastq.gz
15  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_103_lung/fastq/Lung_103_ATAC.fastq.gz
16  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_104_lung/fastq/Lung_104_ATAC.fastq.gz
17  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_2_lung/fastq/Lung_2_ATAC.fastq.gz
18  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_1_lung/fastq/ATACLU1-BD_ATAC_1_lung_cat.fastq.gz
19  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_105_lung/fastq/Lung_105_ATAC.fastq.gz
20  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_101_lung/fastq/Lung_101_ATAC.fastq.gz
21  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_102_lung/fastq/Lung_102_ATAC.fastq.gz
22  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_8_lung/fastq/Lung_8_ATAC.fastq.gz
23  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_9_lung/fastq/Lung_9_ATAC.fastq.gz
24  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_7_lung/fastq/ATACLU7-BD_ATAC_7_lung_cat.fastq.gz
25  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_11_lung/fastq/Lung_11_ATAC.fastq.gz
26  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_12_lung/fastq/Lung_12_ATAC.fastq.gz
27  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_10_lung/fastq/Lung_10_ATAC.fastq.gz
28  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_1_liver/fastq/ATAC_BD_16-BD_ATAC_1_liver_re_TAAGGCG_L005_R1_001.fastq.gz
29  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_105_liver/fastq/Liver_105_ATAC.fastq.gz
30  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_102_liver/fastq/Liver_102_ATAC.fastq.gz
31  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_104_liver/fastq/Liver_104_ATAC.fastq.gz
32  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_2_liver/fastq/ATAC_BD_17-BD_ATAC_2_liver_re_CGTACTA_L006_R1_001.fastq.gz
33  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_103_liver/fastq/Liver_103_ATAC.fastq.gz
34  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_101_liver/fastq/Liver_101_ATAC.fastq.gz
35  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_7_kidney/fastq/ATACKID7-BD_ATAC_7_kidney_cat_060315.fastq.gz
36  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_12_kidney/fastq/ATACKID12-BD_ATAC_12_2ndPrep_kidney_AGGCAG_L006_R1_001.fastq.gz
37  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_9_kidney/fastq/ATAC_BD_20-BD_ATAC_9_kidney_re_GGACTCC_L006_R1_001.fastq.gz
38  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_8_kidney/fastq/ATAC_BD_11-BD_ATAC_8_kidney_re_TCCTGAG_L003_R1_001.fastq.gz
39  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_11_kidney/fastq/ATAC_BD_27-BD_ATAC_11_kidney_re_TCCTGAG_L008_R1_001.fastq.gz
40  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_10_kidney/fastq/CAST_BD_kidney_ATAC_10_cat012016.fastq.gz
```

Select replace from the find menu
Make sure the regex button is selected

```
1   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_105_kidney/fastq/Kidney_105_ATAC.fastq.gz
2   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_101_kidney/fastq/CAST_CTL_kidney_ATAC_101_cat012016.fastq.gz
3   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_104_kidney/fastq/Kidney_104_ATAC.fastq.gz
4   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_103_kidney/fastq/Kidney_103_ATAC.fastq.gz
5   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_2_kidney/fastq/ATACKID2-BD_ATAC_2_kidney_CGTACTA_R1_001.fastq.gz
6   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_102_kidney/fastq/ATACKD102-BD_ATAC_102_kidney_cat_060315.fastq.gz
7   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_1_kidney/fastq/ATAC_BD_1-BD_ATAC_1_kidney_re_TAAGGCG_L002_R1_001.fastq.gz
8   /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_8_liver/fastq/CAST_BD_liver_ATAC_8_cat091516.fastq.gz
9   /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_8_liver/fastq/CAST_BD_liver_ATAC_8_cat012016.fastq.gz
10  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_10_liver/fastq/ATAC_BD_5-BD_ATAC_10_liver_re_GGACTCC_L002_R1_001.fastq.gz
11  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_7_liver/fastq/CAST_BD_liver_ATAC_7_cat012016.fastq.gz
12  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_11_liver/fastq/ATAC_BD_30-BD_ATAC_11_liver_re_CTCTCTA_L008_R1_001.fastq.gz
13  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_9_liver/fastq/CAST_BD_liver_ATAC_9_cat012016.fastq.gz
14  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_12_liver/fastq/ATAC_BD_15-BD_ATAC_12_liver_re_CAGAGAG_L004_R1_001.fastq.gz
15  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_103_lung/fastq/Lung_103_ATAC.fastq.gz
16  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_104_lung/fastq/Lung_104_ATAC.fastq.gz
17  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_2_lung/fastq/Lung_2_ATAC.fastq.gz
18  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_1_lung/fastq/ATACLU1-BD_ATAC_1_lung_cat.fastq.gz
19  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_105_lung/fastq/Lung_105_ATAC.fastq.gz
20  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_101_lung/fastq/Lung_101_ATAC.fastq.gz
21  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_102_lung/fastq/Lung_102_ATAC.fastq.gz
22  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_8_lung/fastq/Lung_8_ATAC.fastq.gz
23  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_9_lung/fastq/Lung_9_ATAC.fastq.gz
24  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_7_lung/fastq/ATACLU7-BD_ATAC_7_lung_cat.fastq.gz
25  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_11_lung/fastq/Lung_11_ATAC.fastq.gz
26  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_12_lung/fastq/Lung_12_ATAC.fastq.gz
27  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_10_lung/fastq/Lung_10_ATAC.fastq.gz
28  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_1_liver/fastq/ATAC_BD_16-BD_ATAC_1_liver_re_TAAGGCG_L005_R1_001.fastq.gz
29  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_105_liver/fastq/Liver_105_ATAC.fastq.gz
30  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_102_liver/fastq/Liver_102_ATAC.fastq.gz
31  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_104_liver/fastq/Liver_104_ATAC.fastq.gz
32  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_2_liver/fastq/ATAC_BD_17-BD_ATAC_2_liver_re_CGTACTA_L006_R1_001.fastq.gz
33  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_103_liver/fastq/Liver_103_ATAC.fastq.gz
34  /proj/fureylab/data/ATAC/mouse/CAST/CTL_liver/BD_ATAC_101_liver/fastq/Liver_101_ATAC.fastq.gz
35  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_7_kidney/fastq/ATACKID7-BD_ATAC_7_kidney_cat_060315.fastq.gz
36  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_12_kidney/fastq/ATACKID12-BD_ATAC_12_2ndPrep_kidney_AGGCAG_L006_R1_001.fastq.gz
37  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_9_kidney/fastq/ATAC_BD_20-BD_ATAC_9_kidney_re_GGACTCC_L006_R1_001.fastq.gz
38  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_8_kidney/fastq/ATAC_BD_11-BD_ATAC_8_kidney_re_TCCTGAG_L003_R1_001.fastq.gz
39  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_11_kidney/fastq/ATAC_BD_27-BD_ATAC_11_kidney_re_TCCTGAG_L008_R1_001.fastq.gz
40  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_10_kidney/fastq/CAST_BD_kidney_ATAC_10_cat012016.fastq.gz
```

Find What: `^(.*/)(fastq/)(.*)(\.fastq\.gz)$`

Replace With: `\1\t\3\t\1\2\3\4`

1 of 40 matches   Tab Size: 4   Plain Text

Type in the find window:

   ^(.*/)(fastq/)(.*)(\.fastq\.gz)$

Type in the replace window

   \1\t\3\t\1\2\3\4

Press **Replace All**

```
1   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_105_kidney/   Kidney_105_ATAC /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/
    BD_ATAC_105_kidney/fastq/Kidney_105_ATAC.fastq.gz
2   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_101_kidney/   CAST_CTL_kidney_ATAC_101_cat012016   /proj/fureylab/data/ATAC/mouse/CAST/
    CTL_kidney/BD_ATAC_101_kidney/fastq/CAST_CTL_kidney_ATAC_101_cat012016.fastq.gz
3   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_104_kidney/   Kidney_104_ATAC /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/
    BD_ATAC_104_kidney/fastq/Kidney_104_ATAC.fastq.gz
4   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_103_kidney/   Kidney_103_ATAC /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/
    BD_ATAC_103_kidney/fastq/Kidney_103_ATAC.fastq.gz
5   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_2_kidney/      ATACKID2-BD_ATAC_2_kidney_CGTACTA_R1_001      /proj/fureylab/data/ATAC/mouse/CAST
    /CTL_kidney/BD_ATAC_2_kidney/fastq/ATACKID2-BD_ATAC_2_kidney_CGTACTA_R1_001.fastq.gz
6   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_102_kidney/   ATACKD102-BD_ATAC_102_kidney_cat_060315 /proj/fureylab/data/ATAC/mouse/CAST/
    CTL_kidney/BD_ATAC_102_kidney/fastq/ATACKD102-BD_ATAC_102_kidney_cat_060315.fastq.gz
7   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_1_kidney/      ATAC_BD_1-BD_ATAC_1_kidney_re_TAAGGCG_L002_R1_001      /proj/fureylab/data/ATAC/
    mouse/CAST/CTL_kidney/BD_ATAC_1_kidney/fastq/ATAC_BD_1-BD_ATAC_1_kidney_re_TAAGGCG_L002_R1_001.fastq.gz
8   /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_8_liver/     CAST_BD_liver_ATAC_8_cat091516   /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/
    BD_ATAC_8_liver/fastq/CAST_BD_liver_ATAC_8_cat091516.fastq.gz
9   /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_8_liver/     CAST_BD_liver_ATAC_8_cat012016   /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/
    BD_ATAC_8_liver/fastq/CAST_BD_liver_ATAC_8_cat012016.fastq.gz
10  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_10_liver/    ATAC_BD_5-BD_ATAC_10_liver_re_GGACTCC_L002_R1_001   /proj/fureylab/data/ATAC/mouse/
    CAST/BD_liver/BD_ATAC_10_liver/fastq/ATAC_BD_5-BD_ATAC_10_liver_re_GGACTCC_L002_R1_001.fastq.gz
11  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_7_liver/     CAST_BD_liver_ATAC_7_cat012016   /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/
    BD_ATAC_7_liver/fastq/CAST_BD_liver_ATAC_7_cat012016.fastq.gz
12  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_11_liver/    ATAC_BD_30-BD_ATAC_11_liver_re_CTCTCTA_L008_R1_001   /proj/fureylab/data/ATAC/mouse/
    CAST/BD_liver/BD_ATAC_11_liver/fastq/ATAC_BD_30-BD_ATAC_11_liver_re_CTCTCTA_L008_R1_001.fastq.gz
13  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_9_liver/     CAST_BD_liver_ATAC_9_cat012016   /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/
    BD_ATAC_9_liver/fastq/CAST_BD_liver_ATAC_9_cat012016.fastq.gz
14  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_12_liver/    ATAC_BD_15-BD_ATAC_12_liver_re_CAGAGAG_L004_R1_001   /proj/fureylab/data/ATAC/mouse/
    CAST/BD_liver/BD_ATAC_12_liver/fastq/ATAC_BD_15-BD_ATAC_12_liver_re_CAGAGAG_L004_R1_001.fastq.gz
15  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_103_lung/   Lung_103_ATAC    /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_103_lung/fastq
    /Lung_103_ATAC.fastq.gz
16  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_104_lung/   Lung_104_ATAC    /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_104_lung/fastq
    /Lung_104_ATAC.fastq.gz
17  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_2_lung/        Lung_2_ATAC /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_2_lung/fastq/
    Lung_2_ATAC.fastq.gz
18  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_1_lung/        ATACLU1-BD_ATAC_1_lung_cat   /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/
    BD_ATAC_1_lung/fastq/ATACLU1-BD_ATAC_1_lung_cat.fastq.gz
19  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_105_lung/   Lung_105_ATAC    /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_105_lung/fastq
    /Lung_105_ATAC.fastq.gz
20  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_101_lung/   Lung_101_ATAC    /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_101_lung/fastq
    /Lung_101_ATAC.fastq.gz
21  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_102_lung/   Lung_102_ATAC    /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_102_lung/fastq
    /Lung_102_ATAC.fastq.gz
22  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_8_lung/ Lung_8_ATAC /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_8_lung/fastq/
    Lung_8_ATAC.fastq.gz
23  /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_9_lung/ Lung_9_ATAC /proj/fureylab/data/ATAC/mouse/CAST/BD_lung/BD_ATAC_9_lung/fastq/
    Lung_9_ATAC.fastq.gz
```

An example of the finished file is in:
    ~/virtuous_bash/CAST_rerun/five_columns.txt

Two step process: Step 2

■ Take the columns from Step 1 and slot them into the string:

```
mkdir -p $TMPDIR/\2

cd $TMPDIR/\2

python atac_v_1_1.py --out-dir \1\out2 --tmp-dir $TMPDIR/\2tmp
    --group-name \2 --max-nhits 1
    --config config.cfg --slurm --section C57BL6 --run \3
```

Mrs. Dalloway said she would buy the #flowers herself.

Type in the find window:

^(.∗/)(fastq/)(.∗)(\.fastq\.gz)$

Type in the replace window

```
mkdir -p $TMPDIR/\2\n
cd $TMPDIR/\2
python atac_v_1_1.py --out-dir \1\out2
 --tmp-dir $TMPDIR/\2tmp --group-name \2
 --max-nhits 1 --config config.cfg
 --slurm --section C57BL6 -run \3
```
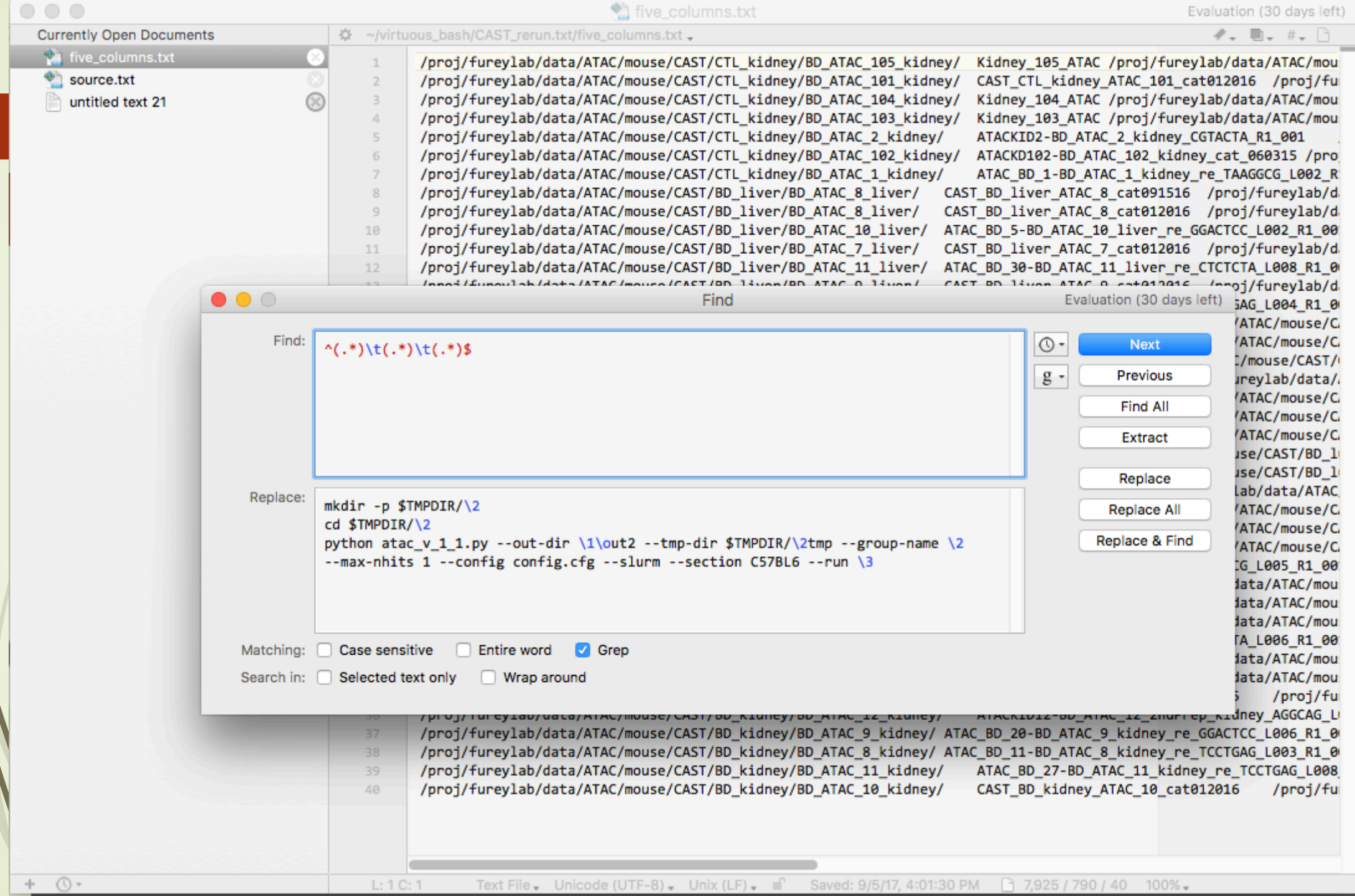Press Replace All

Currently Open Documents | ⚙ ~/virtuous_bash/CAST_rerun.txt/five_columns.txt ▾

five_columns.txt
source.txt
untitled text 21

```
1   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_105_kidney/   Kidney_105_ATAC /proj/fureylab/data/ATAC/mou
2   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_101_kidney/   CAST_CTL_kidney_ATAC_101_cat012016   /proj/fu
3   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_104_kidney/   Kidney_104_ATAC /proj/fureylab/data/ATAC/mou
4   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_103_kidney/   Kidney_103_ATAC /proj/fureylab/data/ATAC/mou
5   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_2_kidney/     ATACKID2-BD_ATAC_2_kidney_CGTACTA_R1_001
6   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_102_kidney/   ATACKD102-BD_ATAC_102_kidney_cat_060315 /pro
7   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_1_kidney/     ATAC_BD_1-BD_ATAC_1_kidney_re_TAAGGCG_L002_R
8   /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_8_liver/   CAST_BD_liver_ATAC_8_cat091516  /proj/fureylab/d
9   /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_8_liver/   CAST_BD_liver_ATAC_8_cat012016  /proj/fureylab/d
10  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_10_liver/  ATAC_BD_5-BD_ATAC_10_liver_re_GGACTCC_L002_R1_00
11  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_7_liver/   CAST_BD_liver_ATAC_7_cat012016  /proj/fureylab/d
12  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_11_liver/  ATAC_BD_30-BD_ATAC_11_liver_re_CTCTCTA_L008_R1_0
```

Find

Evaluation (30 days left)

Find: `^(.*)\t(.*)\t(.*)$`

Next
Previous
Find All
Extract
Replace
Replace All
Replace & Find

Replace:
```
mkdir -p $TMPDIR/\2
cd $TMPDIR/\2
python atac_v_1_1.py --out-dir \1\out2 --tmp-dir $TMPDIR/\2tmp --group-name \2
--max-nhits 1 --config config.cfg --slurm --section C57BL6 --run \3
```

Matching: ☐ Case sensitive   ☐ Entire word   ☑ Grep

Search in: ☐ Selected text only   ☐ Wrap around

```
36  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_12_kidney/   ATACKID12-BD_ATAC_12_2ndPrep_kidney_AGGCAG_L
37  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_9_kidney/    ATAC_BD_20-BD_ATAC_9_kidney_re_GGACTCC_L006_R1_0
38  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_8_kidney/    ATAC_BD_11-BD_ATAC_8_kidney_re_TCCTGAG_L003_R1_0
39  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_11_kidney/   ATAC_BD_27-BD_ATAC_11_kidney_re_TCCTGAG_L008
40  /proj/fureylab/data/ATAC/mouse/CAST/BD_kidney/BD_ATAC_10_kidney/   CAST_BD_kidney_ATAC_10_cat012016   /proj/fu
```

L: 1 C: 1   Text File ▾   Unicode (UTF-8) ▾   Unix (LF) ▾   Saved: 9/5/17, 4:01:30 PM   7,925 / 790 / 40   100% ▾

Currently Open Documents | ~/virtuous_bash/CAST_rerun.txt/five_columns.txt

- five_columns.txt
- source.txt
- untitled text 21

```
1    mkdir -p $TMPDIR/Kidney_105_ATAC
2    cd $TMPDIR/Kidney_105_ATAC
3    python atac_v_1_1.py --out-dir /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_105_kidney/out2 --tmp-dir :
4
5    mkdir -p $TMPDIR/CAST_CTL_kidney_ATAC_101_cat012016
6    cd $TMPDIR/CAST_CTL_kidney_ATAC_101_cat012016
7    python atac_v_1_1.py --out-dir /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_101_kidney/out2 --tmp-dir :
8
9    mkdir -p $TMPDIR/Kidney_104_ATAC
10   cd $TMPDIR/Kidney_104_ATAC
11   python atac_v_1_1.py --out-dir /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_104_kidney/out2 --tmp-dir :
12
```

Find

Evaluation (30 days left)

Find:
```
^(.*)\t(.*)\t(.*)$
```
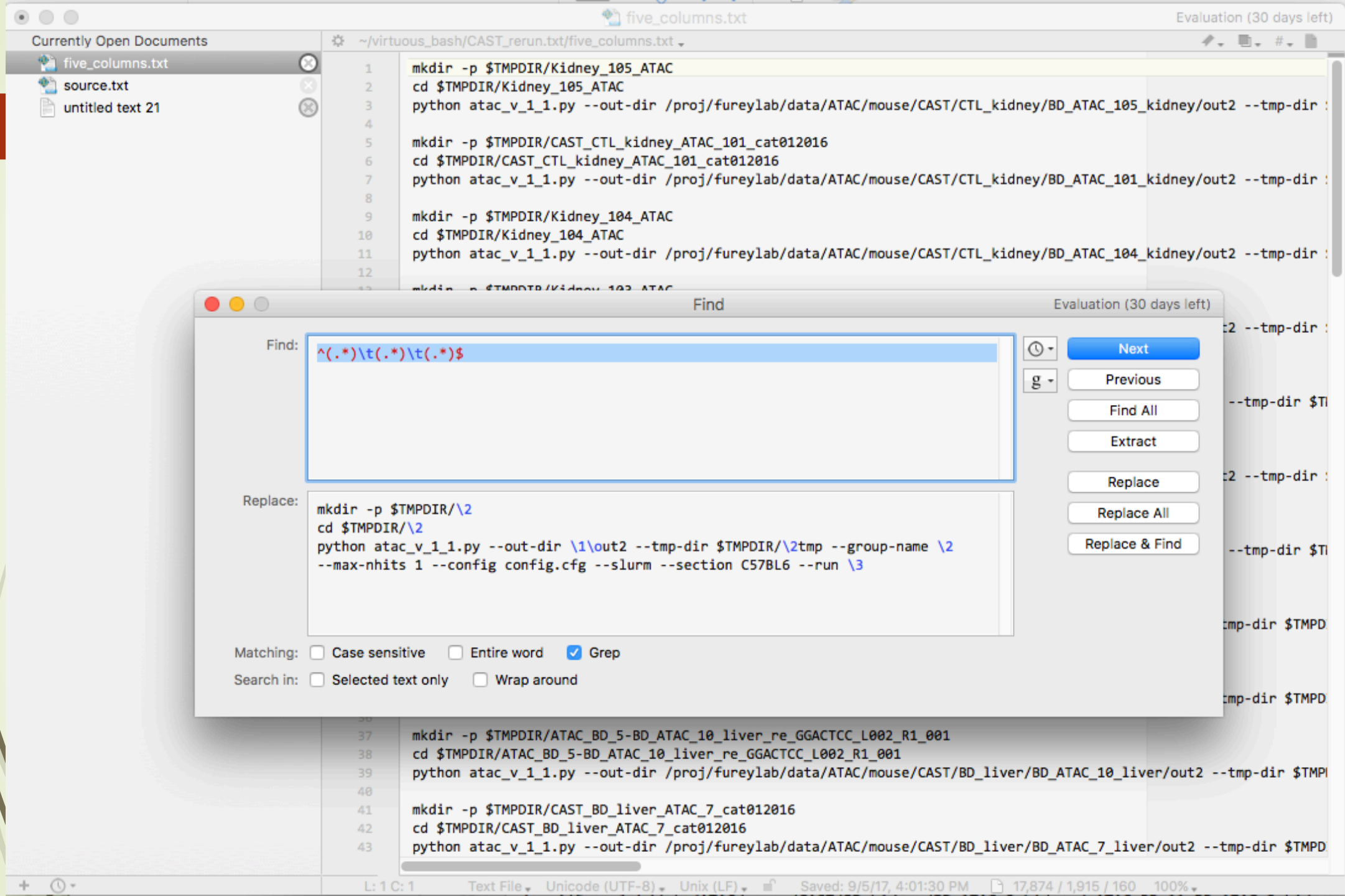
Replace:
```
mkdir -p $TMPDIR/\2
cd $TMPDIR/\2
python atac_v_1_1.py --out-dir \1\out2 --tmp-dir $TMPDIR/\2tmp --group-name \2
--max-nhits 1 --config config.cfg --slurm --section C57BL6 --run \3
```

Next
Previous
Find All
Extract
Replace
Replace All
Replace & Find

Matching: ☐ Case sensitive ☐ Entire word ☑ Grep
Search in: ☐ Selected text only ☐ Wrap around

```
37   mkdir -p $TMPDIR/ATAC_BD_5-BD_ATAC_10_liver_re_GGACTCC_L002_R1_001
38   cd $TMPDIR/ATAC_BD_5-BD_ATAC_10_liver_re_GGACTCC_L002_R1_001
39   python atac_v_1_1.py --out-dir /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_10_liver/out2 --tmp-dir $TMPI
40
41   mkdir -p $TMPDIR/CAST_BD_liver_ATAC_7_cat012016
42   cd $TMPDIR/CAST_BD_liver_ATAC_7_cat012016
43   python atac_v_1_1.py --out-dir /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_7_liver/out2 --tmp-dir $TMPD
```

L: 1 C: 1 | Text File | Unicode (UTF-8) | Unix (LF) | Saved: 9/5/17, 4:01:30 PM | 17,874 / 1,915 / 160 | 100%

untitled   five_columns.txt ✕

```
1   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_105_kidney/—Kidney_105_ATAC-/proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/
    BD_ATAC_105_kidney/fastq/Kidney_105_ATAC.fastq.gz
2   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_101_kidney/  CAST_CTL_kidney_ATAC_101_cat012016  /proj/fureylab/data/ATAC/mouse/CAST/
    CTL_kidney/BD_ATAC_101_kidney/fastq/CAST_CTL_kidney_ATAC_101_cat012016.fastq.gz
3   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_104_kidney/  Kidney_104_ATAC /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/
    BD_ATAC_104_kidney/fastq/Kidney_104_ATAC.fastq.gz
4   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_103_kidney/  Kidney_103_ATAC /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/
    BD_ATAC_103_kidney/fastq/Kidney_103_ATAC.fastq.gz
5   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_2_kidney/    ATACKID2—BD_ATAC_2_kidney_CGTACTA_R1_001    /proj/fureylab/data/ATAC/mouse/CAST
    /CTL_kidney/BD_ATAC_2_kidney/fastq/ATACKID2—BD_ATAC_2_kidney_CGTACTA_R1_001.fastq.gz
6   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_102_kidney/  ATACKD102—BD_ATAC_102_kidney_cat_060315 /proj/fureylab/data/ATAC/mouse/CAST/
    CTL_kidney/BD_ATAC_102_kidney/fastq/ATACKD102—BD_ATAC_102_kidney_cat_060315.fastq.gz
7   /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_1_kidney/    ATAC_BD_1—BD_ATAC_1_kidney_re_TAAGGCG_L002_R1_001    /proj/fureylab/data/ATAC/
    mouse/CAST/CTL_kidney/BD_ATAC_1_kidney/fastq/ATAC_BD_1—BD_ATAC_1_kidney_re_TAAGGCG_L002_R1_001.fastq.gz
8   /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_8_liver/   CAST_BD_liver_ATAC_8_cat091516  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/
    BD_ATAC_8_liver/fastq/CAST_BD_liver_ATAC_8_cat091516.fastq.gz
9   /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_8_liver/   CAST_BD_liver_ATAC_8_cat012016  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/
    BD_ATAC_8_liver/fastq/CAST_BD_liver_ATAC_8_cat012016.fastq.gz
10  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_10_liver/  ATAC_BD_5—BD_ATAC_10_liver_re_GGACTCC_L002_R1_001    /proj/fureylab/data/ATAC/mouse/
    CAST/BD_liver/BD_ATAC_10_liver/fastq/ATAC_BD_5—BD_ATAC_10_liver_re_GGACTCC_L002_R1_001.fastq.gz
11  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_7_liver/   CAST_BD_liver_ATAC_7_cat012016  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/
    BD_ATAC_7_liver/fastq/CAST_BD_liver_ATAC_7_cat012016.fastq.gz
12  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_11_liver/  ATAC_BD_30—BD_ATAC_11_liver_re_CTCTCTA_L008_R1_001   /proj/fureylab/data/ATAC/mouse/
    CAST/BD_liver/BD_ATAC_11_liver/fastq/ATAC_BD_30—BD_ATAC_11_liver_re_CTCTCTA_L008_R1_001.fastq.gz
13  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_9_liver/   CAST_BD_liver_ATAC_9_cat012016  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/
    BD_ATAC_9_liver/fastq/CAST_BD_liver_ATAC_9_cat012016.fastq.gz
14  /proj/fureylab/data/ATAC/mouse/CAST/BD_liver/BD_ATAC_12_liver/  ATAC_BD_15—BD_ATAC_12_liver_re_CAGAGAG_L004_R1_001   /proj/fureylab/data/ATAC/mouse/
    CAST/BD_liver/BD_ATAC_12_liver/fastq/ATAC_BD_15—BD_ATAC_12_liver_re_CAGAGAG_L004_R1_001.fastq.gz
15  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_103_lung/  Lung_103_ATAC   /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_103_lung/fastq
    /Lung_103_ATAC.fastq.gz
16  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_104_lung/  Lung_104_ATAC   /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_104_lung/fastq
    /Lung_104_ATAC.fastq.gz
17  /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_2_lung/    Lung_2_ATAC /proj/fureylab/data/ATAC/mouse/CAST/CTL_lung/BD_ATAC_2_lung/fastq/
    Lung_2_ATAC.fastq.gz
```

Find What:
`^(.*)\t(.*)\t(.*)$`

Find   Replace

Replace With:
```
mkdir -p $TMPDIR/\2
cd $TMPDIR/\2
python atac_v_1_1.py --out-dir \1\out2 --tmp-dir $TMPDIR/\2tmp --group-name \2 --max-nhits 1 --config config.cfg
```

Find All   Replace All

```
1   mkdir -p $TMPDIR/Kidney_105_ATAC
2   cd $TMPDIR/Kidney_105_ATAC
3   python atac_v_1_1.py --out-dir /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_105_kidney/out2 --tmp-dir $TMPDIR/Kidney_105_ATACtmp
    --group-name Kidney_105_ATAC --max-nhits 1 --config config.cfg --slurm --section C57BL6 --run /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/
    BD_ATAC_105_kidney/fastq/Kidney_105_ATAC.fastq.gz
4
5
6   mkdir -p $TMPDIR/CAST_CTL_kidney_ATAC_101_cat012016
7   cd $TMPDIR/CAST_CTL_kidney_ATAC_101_cat012016
8   python atac_v_1_1.py --out-dir /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_101_kidney/out2 --tmp-dir $TMPDIR/
    CAST_CTL_kidney_ATAC_101_cat012016tmp --group-name CAST_CTL_kidney_ATAC_101_cat012016 --max-nhits 1 --config config.cfg --slurm --section C57BL6
    --run /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_101_kidney/fastq/CAST_CTL_kidney_ATAC_101_cat012016.fastq.gz
9
10
11  mkdir -p $TMPDIR/Kidney_104_ATAC
12  cd $TMPDIR/Kidney_104_ATAC
13  python atac_v_1_1.py --out-dir /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_104_kidney/out2 --tmp-dir $TMPDIR/Kidney_104_ATACtmp
    --group-name Kidney_104_ATAC --max-nhits 1 --config config.cfg --slurm --section C57BL6 --run /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/
    BD_ATAC_104_kidney/fastq/Kidney_104_ATAC.fastq.gz
14
15
16  mkdir -p $TMPDIR/Kidney_103_ATAC
17  cd $TMPDIR/Kidney_103_ATAC
18  python atac_v_1_1.py --out-dir /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_103_kidney/out2 --tmp-dir $TMPDIR/Kidney_103_ATACtmp
    --group-name Kidney_103_ATAC --max-nhits 1 --config config.cfg --slurm --section C57BL6 --run /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/
    BD_ATAC_103_kidney/fastq/Kidney_103_ATAC.fastq.gz
19
20
21  mkdir -p $TMPDIR/ATACKID2-BD_ATAC_2_kidney_CGTACTA_R1_001
22  cd $TMPDIR/ATACKID2-BD_ATAC_2_kidney_CGTACTA_R1_001
23  python atac_v_1_1.py --out-dir /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_2_kidney/out2 --tmp-dir $TMPDIR/
    ATACKID2-BD_ATAC_2_kidney_CGTACTA_R1_001tmp --group-name ATACKID2-BD_ATAC_2_kidney_CGTACTA_R1_001 --max-nhits 1 --config config.cfg --slurm
    --section C57BL6 --run /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_2_kidney/fastq/ATACKID2-BD_ATAC_2_kidney_CGTACTA_R1_001.fastq.gz
24
25
26  mkdir -p $TMPDIR/ATACKD102-BD_ATAC_102_kidney_cat_060315
27  cd $TMPDIR/ATACKD102-BD_ATAC_102_kidney_cat_060315
28  python atac_v_1_1.py --out-dir /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_102_kidney/out2 --tmp-dir $TMPDIR/
    ATACKD102-BD_ATAC_102_kidney_cat_060315tmp --group-name ATACKD102-BD_ATAC_102_kidney_cat_060315 --max-nhits 1 --config config.cfg --slurm
    --section C57BL6 --run /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_102_kidney/fastq/ATACKD102-BD_ATAC_102_kidney_cat_060315.fastq.gz
29
30
31  mkdir -p $TMPDIR/ATAC_BD_1-BD_ATAC_1_kidney_re_TAAGGCG_L002_R1_001
32  cd $TMPDIR/ATAC_BD_1-BD_ATAC_1_kidney_re_TAAGGCG_L002_R1_001
33  python atac_v_1_1.py --out-dir /proj/fureylab/data/ATAC/mouse/CAST/CTL_kidney/BD_ATAC_1_kidney/out2 --tmp-dir $TMPDIR/
    ATAC_BD_1-BD_ATAC_1_kidney_re_TAAGGCG_L002_R1_001tmp --group-name ATAC_BD_1-BD_ATAC_1_kidney_re_TAAGGCG_L002_R1_001 --max-nhits 1 --config
```
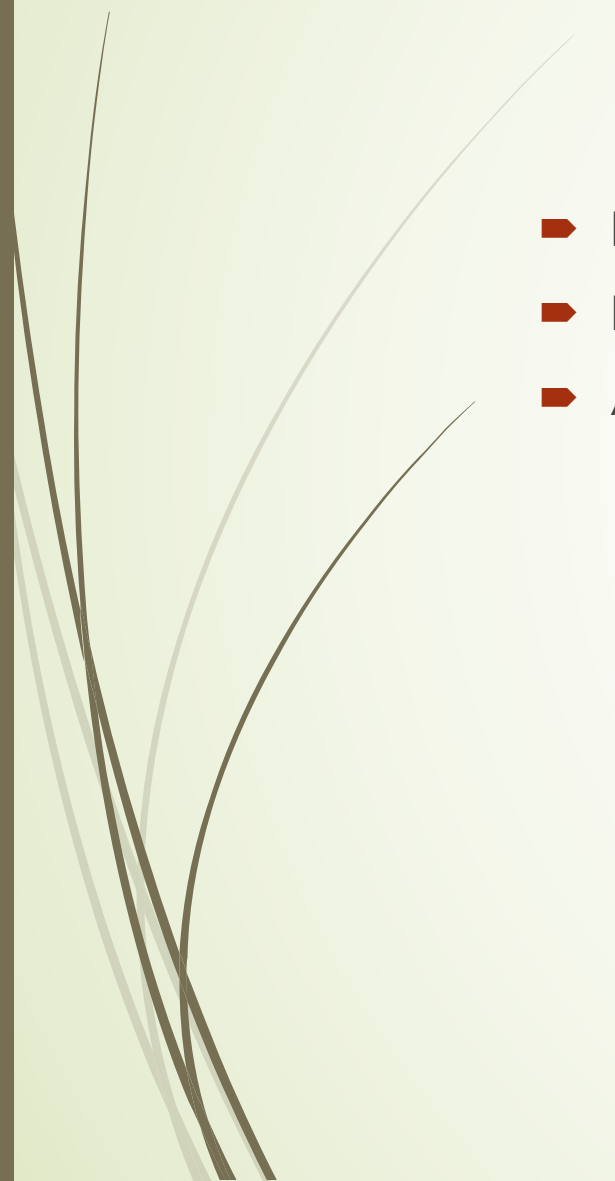
Other uses for the technique

- Formatting the genome browsers *.ra files (or any large config file)

track CC001_Control_LUNG_ATAC_14
shortLabel CC001_Control_LUNG_ATAC_14
longLabel CC001_Control_LUNG_ATAC_14
parent BD_ATAC_LUNG_CC
visibility full
type bigWig
priority 25
maxHeightPixels 100:32:32
autoScale on
windowingFunction maximum
color 0,0,128
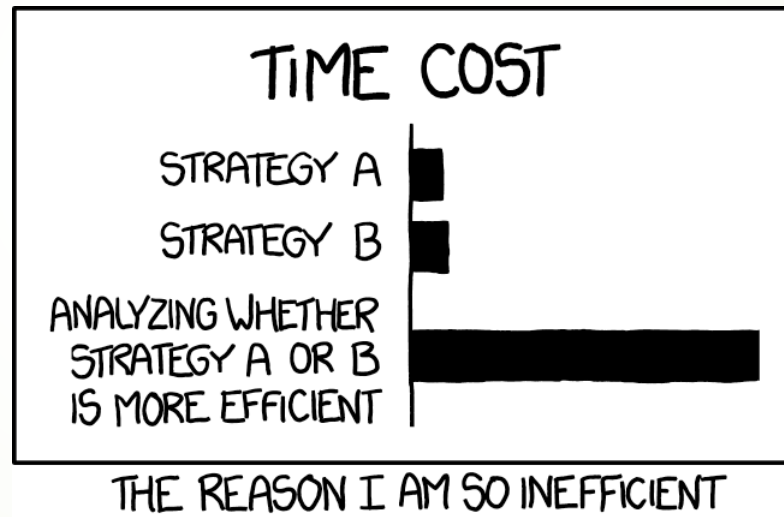bigDataUrl CC_ATAC/bacCC001_Control_LUNG_ATAC_14.bw

Other uses for the technique

- Large bulk move scripts
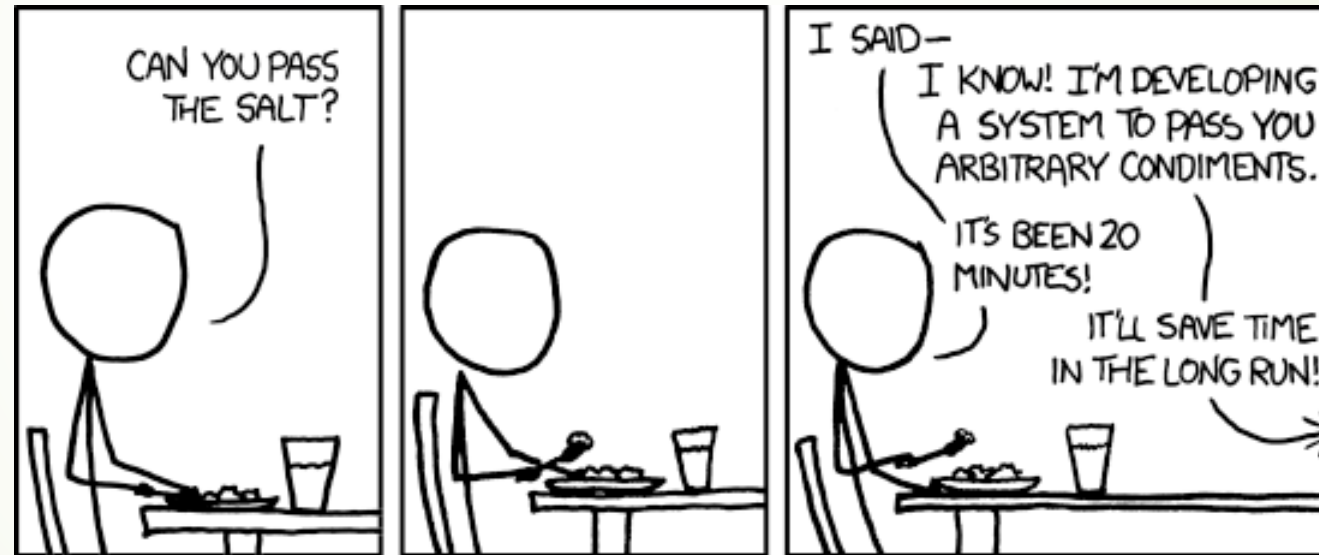
- Bulk changing file formats in situ

- And others…

Pitfalls

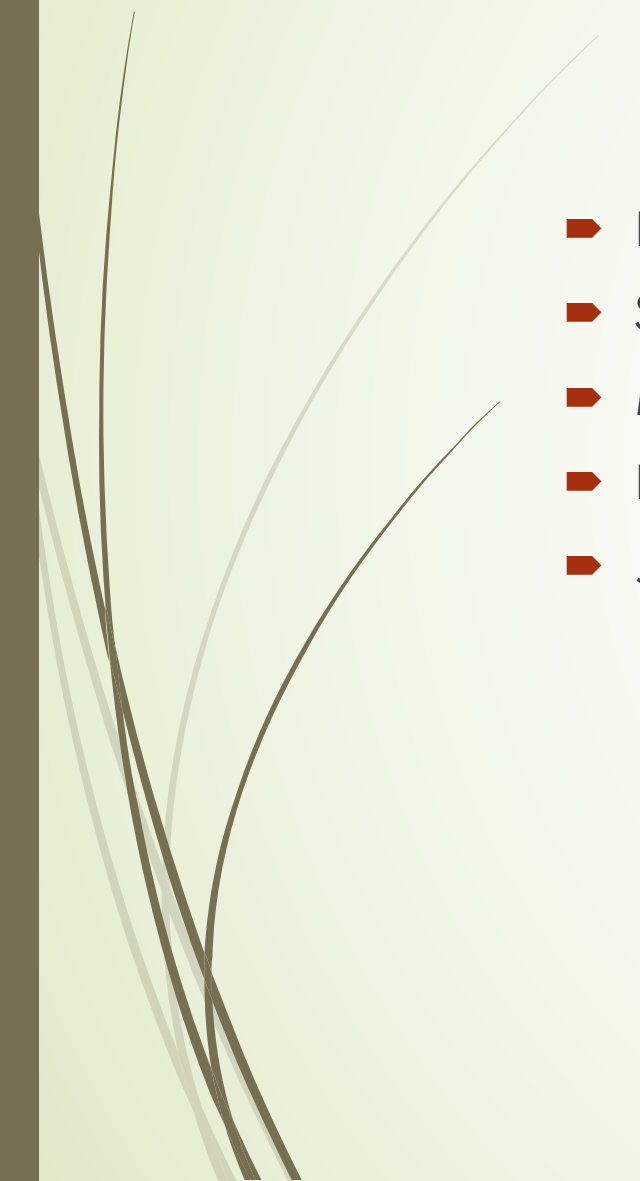# Choose with prejudice

The general solution can be expensive

Thanks Everyone

- Furey Lab
- Sheikh Lab
- Mohlke Lab
- Karl Eklund and Research Computing
- Jeremy Simon for the Genome Browser Example

Unused Material

For loops

- Remember the files in ~/virtuous_bash/no_leading_zero/?
- How did I create them easily:
  - for i in $(seq 1 20); do touch "file$i.txt"; done