

Name _____

ID Number _____

Final Exam

System Programming

Spring 2011

This exam follows a simple format. We imagine that there is a text file named a.txt residing in the current directory. The content of this file is:

```
% head -15 a.txt
ALICE'S ADVENTURES IN WONDERLAND
Lewis Carroll
```

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CHAPTER I. Down the Rabbit-Hole

Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do: once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it, 'and what is the use of a book,' thought Alice 'without pictures or conversation?'

So she was considering in her own mind (as well as she could, for the

Now, for each of the commands shown below, decide what the proper output should be. Then look for that output in the list of choices file that you have received. If you find it, write the pair of letters for that choice into the space to the right of the question. If you don't find it, choose the option "BW". If there is no output, then choose "BV"

Let me answer a few concerns here:

1. There are no errors in the commands below.
2. The commands are run in C shell (tsh).
3. More than one command may produce the same output. So you might use the same letter-pair in several places.
4. I have intentionally put some incorrect choices into the output. So some letter-pairs will never be used.
5. Spaces matter, as do blank lines. The output only matches if it is a perfect match.
6. To make your searching faster, you can see that I have grouped the choices. They are kind of in alphabetical order – based on the first output line, and also based on shorter outputs going first.
7. Most questions are worth one point. But longer commands may be worth up to 3 points.

- ```
___1: #!/usr/bin/tcsh
___2: head a.txt | grep .
___3: head a.txt | egrep "\VT|A|"
___4: head a.txt | awk '1;{print ""}'
___5: head a.txt | awk 'BEGIN{ORS="\n\n"};1'
___6: head a.txt | awk 'NF{print $0 "\n"}'
___7: head a.txt | awk '1;{print "\n"}'
___8: head a.txt | awk 'NF{$0=++a " " $0};1'
___9: head a.txt | awk 'END{print NR}'
___10: head a.txt | awk '{for (i=1; i<=NF; i++) s=s+$i}; END{print s}'
___11: head a.txt | awk '/the/{total = total + NF }; END {print total}'
___12: head a.txt | awk '{i=NF/2; print $i, $i+1 }'
```

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__13: head a.txt | awk 'NF > 4'
__14: head a.txt | tail -4 | awk '{for (i=1; i<NF; i++) {if ($i in A) printf ("%s ", A[i]);
 else {printf ("%s ", $i); A[$i]=++x}};print ""}'
__15: head -2 a.txt | sed 's/ / /g' | awk 'BEGIN{FS="["};{$1=$1};1'
__16: head -2 a.txt | awk '{printf "%79s\n", $0}'
__17: head a.txt | tail -2 | awk '\!/bank/{gsub(/the/, "");}; 1'
__18: head a.txt | tail -2 | awk '{a[i++]=$0} END {for (j=i-1; j>=0;) print a[j--] }'
__19: head a.txt | tail -2 | awk '{print $2, $1}'
__20: head a.txt | tail -2 | awk '{ $2 = ""; print }'
__21: head a.txt | tail -1 | awk '{for (i=NF; i>0; i--) printf("%s ", $i);print ""}'
__22: head a.txt | tail -2 | wc -1
__23: head a.txt | tail -1 | tr " " "\n" | cat -n | sort -gr | sed 's/[^\t]*[^\t]//' |
 tr "\n" " "
__24: head a.txt | awk 'NR>2{exit};1'
__25: head a.txt | awk '{y=x "\n" $0; x=$0};END{print y}'
__26: head a.txt | awk '/the/'
__27: head a.txt | grep 'the'
__28: head a.txt | sed '/the/ p'
__29: head a.txt | sed 's/the/the/p'
__30: head a.txt | awk '$7 ~ /^[t]/'
__31: head a.txt | awk '/do/{print x};{x=$0}'
__32: head a.txt | awk '/ALICE/{getline;print}'
__33: head a.txt | tail -5 | awk 'NR==2, NR==4'
__34: head a.txt | awk NF
__35: head a.txt | awk '/./'
__36: head a.txt | awk 'a \!~ $0; {a=$0}'
__37: head a.txt | awk '\!a[$0]++'
__38: head a.txt | awk 'BEGIN{FS="\n";OFS=" ";RS=" ";ORS=" \n"}{$1=$1;print}'
__39: head a.txt | sed G
__40: head a.txt | sed '/^$/d;G'
__41: head a.txt | sed '/^$/d;G' | sed 'n;d'
__42: head a.txt | sed '/the/{x;p;x;}'
__43: head a.txt | sed '/the/G'
__44: head a.txt | grep ' '
__45: head a.txt | sed = | sed 'N;s/\n\\t/'
__46: head a.txt | sed '=;N;s/\n\\t/'
__47: head a.txt | sed '/./=' | sed '/./N; s/\n/ /'
__48: head a.txt | sed -n '$='
__49: head a.txt | tr -d "A-Za-z"
__50: head a.txt | tr -d "A-Za-z" | awk '/./{ $1=$1 }'
__51: head a.txt | tr -d "A-Za-z" | awk '/[.]/{ $1=$1 }1'
__52: head a.txt | tr -d "A-Za-z" | sed 's/[^\t]*[^\t]//'
__53: head a.txt | sed 's/[A-Z]/&/g'

```

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___54: head a.txt | sed 's/[A-Z]/[a-z]/g'
___55: head a.txt | sed 's/[A-Z]/[a-z]/'
___56: head a.txt | sed -n 's/(.*) o\(.* o\)/\1 O\2/p'
___57: head a.txt | sed '/was/s/the//p'
___58: head a.txt | sed -n '1\|G:h;$p'
___59: head a.txt | sed '1\|G:h;$\|d'
___60: head a.txt | sed '/\n/\|G:s/(\.\\)(.*\n)/&\2\1/;/D;s/.//'
___61: head -7 a.txt | sed '$\|N;s/\n/ /'
___62: head a.txt | sed -e :a -e '/D$/N; s/\n//; ta'
___63: grep -v '\$' a.txt | cut -c1-2 | head -12
___64: grep -v '\$' a.txt | cut -c1-2 | head -12 | sed -e :a -e '$\|N;s/\nb/ b/;ta' -e 'P;D'
___65: head a.txt | sed q
___66: head a.txt | sed -e :a -e '$q;N;5,$D;ba'
___67: head a.txt | sed '$\|d'
___68: head a.txt | sed -e '$\|{h;d;}' -e x
___69: head a.txt | sed '/the/\|d'
___70: head a.txt | sed '/the/\|p'
___71: head a.txt | sed -n '/WONDER/{n;p;}'
___72: head a.txt | sed -e './{H;$\|d;}' -e 'x;/once/\|d;'
___73: head a.txt | sed -n '/the/, $p'
___74: head a.txt | sed -n '8,12p'
___75: head a.txt | sed '2\|d'
___76: head a.txt | sed '/\$/;/the/d'
___77: head a.txt | uniq
___78: head a.txt | sed '$\|N; /\(\.*\)\n1$/\|P; D'
___79: head a.txt | sed 'N;$\|P;$\|D;$d'
___80: head a.txt | sed -e :a -e '$d;N;2,5ba' -e 'P;D'
___81: head a.txt | sed -n -e :a -e '1,5\!{P;N;D;};N;ba'
___82: head a.txt | sed 'n;n;n;n;d;'
___83: head a.txt | sed -n '/\$/{p;h;};/./{x;/./p;}'
___84: set x = `head -2 a.txt | wc -w` | awk '{print $x}' a.txt | head
___85: set the = "the"; head a.txt | grep '$the'
___86: head a.txt | grep -ni "the" | sed -e 's_\([0-9]*\):.*_\1_' | tr "\n" " "
___87: head -2 a.txt | tr -c "a-zA-Z" "n-za-mN-ZA-M"
___88: head -2 a.txt | tr "a-zA-Z" "n-za-mN-ZA-M"
___89: head -2 a.txt
___90: head a.txt | tail -3
___91: head -5 a.txt
___92: head a.txt | sed '1 p; 3p; 5p'
___93: head a.txt | sed -n '1 p; 3p; 5p'
```

Here is the input file:

% head -15 a.txt  
ALICE'S ADVENTURES IN WONDERLAND  
Lewis Carroll

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CHAPTER I. Down the Rabbit-Hole

Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do: once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it, 'and what is the use of a book,' thought Alice 'without pictures or conversation?'

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And here are the choices:

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Lewis Carroll

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AB: ALICE'S ADVENTURES IN WONDERLAND

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AC: ALICE'S ADVENTURES IN WONDERLAND  
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AD: ALICE'S ADVENTURES IN WONDERLAND

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AE: ALICE'S ADVENTURES IN WONDERLAND  
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CHAPTER I. Down the Rabbit-Hole

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Alice was beginning to get very tired of sitting by her sister on the

**BB:**

Alice was beginning to get very tired of sitting by her sister on bank, and of having nothing to do: once or twice she had peeped into the

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Alice beginning to get very tired of sitting by her sister on the bank, of having nothing to do: once or twice she had peeped into the

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Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do: once or twice she had peeped into the

**BE:**

Alice was beginning to get very tired Of sitting by her sister on the bank, and of having nothing to do: Once or twice she had peeped into the

**BF:**

bank, and of having nothing to do: once or twice she had peeped into the

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CHAPTER I. Down the Rabbit-Hole

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Lewis Carroll

ALICE'S ADVENTURES IN WONDERLAND

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**BJ:**

Lewis Carroll

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BU:  
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BV:  
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BW:  
Other (output is not listed)