

Name: _____
Final examination
CS-210 Introduction to Unix
Spring 2025
Each question is worth one point.
Total points possible: 20

About the final exam:

- The final is closed-book.
- No electronic devices may be used during the exam.
- You may refer to one 8.5-inch by 11-inch sheet of paper full of notes during the exam.
- Notes may be written on both sides of the sheet of paper.
- Notes may not be shared among students during the examination process.

1. A text file named “stock_prices.txt” is located in your home directory on Blue (the Unix server). This file contains the following information separated by the vertical pipe symbol “|”:

- Stock trading date in MM-DD-YYYY format (MM=two digit month, DD=two digit day, YYYY=four digit year)
- Full name of the company
- The company’s stock ticker symbol
- Closing price of the stock at 4pm EST
- Trading volume of the stock at 4pm EST
- Price change as a percent since previous closing day

The contents of ~/stock_prices.txt contains six rows of data as follows:

```
05-09-2025|Apple Inc.|AAPL|$198.53|50,478,870|+0.53
05-09-2025|The Coca-Cola Company|KO|$70.52|8,206,921|-0.91
05-09-2025|The Clorox Company|CLX|$134.76|1,577,304|-2.21
05-09-2025|Monster Beverage Corporation|MNST|$61.00|8,215,301|+1.43
05-09-2025|Iovance Biotherapeutics, Incorporated|IOVA|$1.75|111,124,771|-44.79
05-09-2025|Regencell Bioscience Holdings Limited|RGC|$366.01|117,870|+72.65
```

What is the exact grep or egrep command you would type on Blue to list the entire row of stock information in the file ~/stock_prices.txt where the stock ticker symbol is exactly three characters in length?

2. What is the exact grep or egrep command you would type on Blue to list the entire row of stock information in the file ~/stock_prices.txt (from question one above) where the stock price percent change is a gain of +10 or more?

3. What is the exact grep or egrep command you would type on Blue to list the entire row of stock information in the file ~/stock_prices.txt (from question one above) where the stock trading volume is greater or equal to 1,000,000?

4. What is the exact grep or egrep command you would type on Blue to list the entire row of stock information in the file ~/stock_prices.txt (from question one above) where the stock closing price is between \$50.00 and \$70.99 inclusive?

5. What is the exact grep or egrep command you would type on Blue to COUNT the number of words in /usr/share/dict/words that meets the following specification:

- The word must contain only lower case letters (no other symbols)
- The total word length is exactly eleven characters long
- The word must end with a "u".

6. What is the exact grep or egrep command you would type on Blue to list the words in /usr/share/dict/words that meet the following specification:

- The first letter must be upper-case.
- Except for the first letter, all letters must be lower-case.
- The total word length must be between four and ten characters in length inclusive

7. What is the exact grep or egrep command you would type on Blue to list the words in /usr/share/dict/words that meet the following specification:

- All letters must be lower case.
- The word must begin with one of the following letters: "r", "s", "t", "l", "n", or "e".
- The total word length must be exactly eighteen characters in length

8. What is the exact grep or egrep command you would type on Blue to list the words in /usr/share/dict/words that meet the following specification:

- All letters must be lower case.
- The word must begin with one of the following letters: "k", "h", or "z".
- The word must end with one of the following letters: "d" or "g".
- The total word length must be between five and fifteen characters in length

9. A text file named "birthdays.txt" is located in your home directory on Blue. This file contains the following information separated by commas:

- first name and last name
- date of birth in the format YYYY-MM-DD

The contents of ~/birthdays.txt are as follows:

```
Linda Sawyer,1962-06-01  
Gray Gaines,1968-05-03  
Canaan Castro,1996-03-05  
Bo Cannon,1987-05-03  
Thalia Gray,1982-01-06
```

What is the exact grep or egrep command you would type on Blue to list the name and birthdate information for all contacts born on the third day (DD=03) of any month.

10. Using the text file named "birthdays.txt" (mentioned in question nine above) located in your home directory on Blue, what is the exact grep or egrep command you would type on Blue to list the name and birthdate information for all contacts born in the sixth month (MM=06).

11. Using the text file named "birthdays.txt" (mentioned in question nine above) located in your home directory on Blue, what is the exact grep or egrep command you would type on Blue to list the name and birthdate information for all contacts with their first name matching "Gray".

12. Using the text file named "birthdays.txt" (mentioned in question nine above) located in your home directory on Blue, what is the exact grep or egrep command you would type on Blue to list the name and birthdate information for all contacts with last name beginning with "C".

13. A text file named “secret_message.txt” is located in your home directory on Blue. This file contains upper and lower case letters, digits, as well as punctuation symbols (hyphen, left parenthesis, right parenthesis, and period). The unencoded contents of “secret_message.txt” is as follows:

This message uses ROT-5 encoding from Table THREE for digits (rotate by five digits) and ROT-13 encoding (rotate by thirteen characters) from Table ONE (for upper case letters) and Table TWO (for lower case letters).

Table 1: encode upper case letters:

INPUT LETTER	OUTPUT LETTER
A	n
B	o
C	p
D	q
E	r
F	s
G	t
H	y
I	v
J	w
K	x
L	y
M	z
N	a
O	b
P	c
Q	d
R	e
S	f
T	g
U	h
V	i
W	j
X	k
Y	l
Z	m
a	N
b	O
c	P
d	Q
e	R
f	S
g	T
h	U
i	V
j	W
k	X
l	Y
m	Z
n	A
o	B
p	C
q	D
r	E
s	F
t	G
u	H
v	I
w	J
x	K
y	L
z	M

Table 2: encode lower case letters:

INPUT LETTER	OUTPUT LETTER
a	N
b	O
c	P
d	Q
e	R
f	S
g	T
h	U
i	V
j	W
k	X
l	Y
m	Z
n	A
o	B
p	C
q	D
r	E
s	F
t	G
u	H
v	I
w	J
x	K
y	L
z	M

Table 3: encode digits

INPUT DIGIT	OUTPUT DIGIT
0	5
1	6
2	7
3	8
4	9
5	0
6	1
7	2
8	3
9	4

(question 13 continued)

Using the translation tables one, two, and three (above), what is the exact “tr” command you would type on Blue to convert the secret_message.txt (above) into the following text:

Guvf zrffntr hfrf EBG-0 rapbqvaf sebz Gnoyr GUERR sbe qvtvgf (ebgngr ol svir qvtvgf) naq EBG-68 rapbqvaf (ebgngr ol guvegrra punenpgref) sebz Gnoyr BAR (sbe hccre pnfr yrggref) naq Gnoyr GJB (sbe ybjre pnfr yrggref).

14. A text file named “tabs.txt” in your home directory under the Blue Unix server contains horizontal tab characters (denoted as ASCII “`\t`”) throughout the file and a line-feed character (denoted as ASCII “`\n`”). The contents of “tabs.txt” is as follows:

This file contains tab control characters between each word .

A character-by-character output of the “tabs.txt” file is as follows (note the presence of the tab “`\t`” character):

```
T   h   i   s   \t   f   i   l   e   \t   c   o   n   t   a   i   n   s   \t   t
a   b   \t   c   o   n   t   r   o   l   \t   c   h   a   r   a   c   t   e   r
s   \t   b   e   t   w   e   e   n   \t   e   a   c   h   \t   w   o   r   d   \t
.   \n
```

What is the exact “tr” command you would enter on Blue to remove all “`\t`” tab characters from this file? Your output should go directly to the screen. If done correctly, your output will look like this:

Thisfilecontainstabcontrolcharactersbetweeneachword.

15. The asterisk metacharacter has what special meaning in a POSIX Basic Regular Expression?

16. The plus metacharacter has what special meaning in a POSIX Extended Regular Expression?

17. The question mark metacharacter has what special meaning in a POSIX Extended Regular Expression?

18. The pipe metacharacter has what special meaning in a POSIX Extended Regular Expression?

19. The caret metacharacter “^” has what special meaning in a POSIX Basic Regular Expression?

20. The dollar metacharacter “\$” has what special meaning in a POSIX Basic Regular Expression?
