

Midterm

EECS 2031 - Fall 2019

Software Tools

Version B

Family Name: _____

Given Name(s): _____

Student Number: |__| |__| |__| |__| |__| |__| |__| |__| |

Guidelines and Instructions:

1. This exam contains 14 pages (including this cover page) and 45 questions.
 2. This is a 90-minute test. No aids are allowed.
 3. All questions are weighed equally, but some questions require more time than others, so be strategic about it. Questions are presented in random order, so if you find a question hard, move to the next one.
 4. Answer questions **both** on the scantron sheet (official) and on this paper (backup).
The scantron sheet and this paper must be submitted together.
 5. Use an HB pencil to fill the scantron sheet.
 6. Keep your eyes on your own work. At the discretion of the invigilators, students may be asked to move.
 7. If you need to use the washroom, you must leave your cellphone with the instructor.
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1. (1 point) Suppose the current directory contains only one file called `a.txt`. What will be the output of the following command?

```
find ~ -type f -name *.txt
```

- A. A list of all `.txt` files in any directory under your home directory
- B. A list of all `.txt` files in any directory under your home directory except for the `a.txt` in the current directory
- C. A list of all files in any directory under your home directory that are called `a.txt`
- D. A list containing only the `a.txt` file in the current directory
- E. None of the above

2. (1 point) What is the output of the following command?

```
ls -l | cut -c4 | grep x | wc -l
```

- A. The number of files in the current directory whose name contains the character `x`
- B. The total number of lines for all files whose name contains the character `x`
- C. The number of files in the current directory with execute permission for the user
- D. None of the above

3. (1 point) Which of the following conditions is guaranteed to never cause an error in a shell script regardless of the values of the variables in it?

- A. `test $1 = "bil"`
- B. `test "$1" = $name`
- C. `test $12 = bil`
- D. All of the above
- E. None of the above

4. (1 point) For which of the following commands will the output be

```
one,two,three
```

- A. `echo one,two,three | grep o`
- B. `echo one,two,three | grep o*`
- C. `echo one,two,three | grep 'o*'`
- D. `echo one,two,three | grep '^o*'`
- E. Exactly two of A,B,C,D
- F. Exactly three of A,B,C,D
- G. All of A,B,C,D

5. (1 point) Which of the following is an absolute path name in Unix?

- A. `/usr/home`
- B. `usr/home`
- C. `usr/home/`
- D. `C:\User\home`
- E. All of the above
- F. None of the above

6. (1 point) What will the following command do?

```
echo *
```

- A. Cause an error
- B. Output the single character `*`
- C. List all files in the current directory
- D. None of the above

7. (1 point) Which of the following commands will change the current directory to the parent directory of the current directory?

- A. `cd`
- B. `cd .`
- C. `cd ..`
- D. `cd ~`
- E. All of the above
- F. None of the above

8. (1 point) Is it possible to construct a situation in which the following command does not cause an error?

```
cd *
```

- A. No
- B. Yes, if there is a directory called `*` in the current directory
- C. Yes, if the current directory is empty
- D. None of the above

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9. (1 point) When the `grep` command does not find the pattern in the file(s) it is searching, it silently returns the prompt.
- A. True
 - B. False
10. (1 point) Suppose that the current directory contains the following files:
`a2.txt` `ab1.doc` `ab123.pdf` `b1.tex` `b12.exe`
How many files will be listed by the following command?
`ls [ab]?[123]*`
- A. 0
 - B. 1
 - C. 2
 - D. 3
 - E. 4
 - F. 5
11. (1 point) The input to the `uniq` command must be sorted.
- A. True
 - B. False
12. (1 point) Which of the following commands will run “in the background”?
- A. `date`
 - B. ``date``
 - C. `date ;`
 - D. `date &`
 - E. None of the above

13. (1 point) Which of the following commands will produce the output: `two`
- A. `echo one,two,three | cut -f2 -d,`
 - B. `echo one,two,three | cut -c5-7`
 - C. `echo one,two,three | cut -f2 -de | cut -c2-4`
 - D. Exactly two of A,B,C
 - E. All of A,B,C
 - F. None of the above
14. (1 point) How many shells can run simultaneously in a Unix system?
- A. 1
 - B. 2
 - C. 3
 - D. More than three
15. (1 point) Consider the following two lines from some script. In which line(s) does `wc` receive input from standard input?
- ```
wc -l a.txt
cat a.txt | wc -l
```
- A. Only the first one
  - B. Only the second one
  - C. Both lines
  - D. Neither of the lines
16. (1 point) Which of the following commands will list all files whose name starts with the character `a`
- A. `ls a*`
  - B. `ls a.*`
  - C. `ls 'a*'`
  - D. `ls 'a.*'`
  - E. All of the above
  - F. None of the above
17. (1 point) Which of the following commands appends the output of `ls` to the end of file `output.txt` ?
- A. `ls > output.txt`
  - B. `ls >> output.txt`
  - C. `ls < output.txt`
  - D. None of the above

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18. (1 point) Which command can one use to list the differences between file `a.txt` and what is in the standard input of `diff` ?
- A. `diff a.txt -`
  - B. `diff a.txt &`
  - C. `diff a.txt $`
  - D. `diff a.txt @`
  - E. None of the above
19. (1 point) This `grep` option selects lines that are not matching any of the specified patterns.
- A. `-i`
  - B. `-v`
  - C. `-l`
  - D. `-c`
  - E. None of the above
20. (1 point) Which of the following commands will output the following?
- ```
I love Unix
```
- A. `echo I love Unix`
 - B. `echo 'I love Unix'`
 - C. `echo "I love Unix"`
 - D. `echo `I love Unix``
 - E. Exactly two of A,B,C,D
 - F. Exactly three of A,B,C,D
 - G. All of A,B,C,D
21. (1 point) Which of the following Unix commands can be used to rename a file in the current working directory?
- A. `ls`
 - B. `cp`
 - C. `mv`
 - D. `rm`
 - E. All of the above
 - F. None of the above

Suppose that the output of the command

```
ls -l midterm
```

is as follows:

```
-rw-r--r--@ 1 bil  staff  420  4 Oct 17:37 midterm
```

The next **three questions** refer to the above:

22. (1 point) `midterm` is a directory.
 - A. True
 - B. False

23. (1 point) Which of the following commands will change the permissions for `midterm` ?
 - A. `chmod 644 midterm`
 - B. `chmod a+r midterm`
 - C. `chmod u+w midterm`
 - D. All of the above
 - E. None of the above

24. (1 point) Which of the following commands will ensure that the user has execute permission for `midterm`?
 - A. `chmod 700 midterm`
 - B. `chmod 744 midterm`
 - C. `chmod u+x midterm`
 - D. `chmod a+x midterm`
 - E. All of the above
 - F. None of the above

25. (1 point) Which of the following Unix commands can be used to output the full path to the current working directory?
 - A. `cd`
 - B. `cwd`
 - C. `pwd`
 - D. `dir`
 - E. All of the above
 - F. None of the above

26. (1 point) Shell scripts must be saved in a file with the extension `.sh`
- A. True
 - B. False
27. (1 point) Shell scripts are executed in a separate child shell process.
- A. True
 - B. False
28. (1 point) What will be the output of the following command?
- ```
echo one,two,three | tr one two
```
- A. `one,two,three`
  - B. `one,one,three`
  - C. `two,two,three`
  - D. None of the above
29. (1 point) Comments in a shell script start with the character ...
- A. `!`
  - B. `%`
  - C. `$`
  - D. `#`
  - E. None of the above
30. (1 point) To declare an integer variable in a shell script, one needs to write...
- A. `int x;`
  - B. `x int;`
  - C. `integer x;`
  - D. `x integer;`
  - E. None of the above
31. (1 point) The number of command-line arguments in a script is indicated by ...
- A. `$$`
  - B. `$?`
  - C. `$0`
  - D. `$#`
  - E. `$*`
  - F. None of the above

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32. (1 point) The name of the script is indicated by ...
- A. \$\$
  - B. \$?
  - C. \$0
  - D. \$#
  - E. \$\*
  - F. None of the above
33. (1 point) The exit status of the last process that terminated is indicated by ...
- A. \$\$
  - B. \$?
  - C. \$0
  - D. \$#
  - E. \$\*
  - F. None of the above
34. (1 point) The process id of the shell running the script is indicated by ...
- A. \$\$
  - B. \$?
  - C. \$0
  - D. \$#
  - E. \$\*
  - F. None of the above
35. (1 point) Which of the following Unix commands can be used to create an empty file in the current working directory?
- A. `ef`
  - B. `create`
  - C. `touch`
  - D. `cal`
  - E. All of the above
  - F. None of the above
36. (1 point) Which notation is an alternative to the `test` command?
- A. ( )
  - B. [ ]
  - C. { }
  - D. All of the above
  - E. None of the above

Consider the script below and answer the following **two** questions.

```
#!/bin/sh
price='$100'
if test "$price" = "$100"
then
 echo -n 1
else
 echo -n 2
fi
if test '$price' = '$100'
then
 echo 3
else
 echo 4
fi
```

37. (1 point) What will be the output if the script is run with no arguments?
- A. 13
  - B. 14
  - C. 23
  - D. 24
38. (1 point) What will be the output if the script is run with the following argument: '\$1'?
- A. 13
  - B. 14
  - C. 23
  - D. 24
39. (1 point) How would you describe the output produced by the following script?

```
#!/bin/sh
for i in *
do
 if test ! -s "$i"
 then
 echo "$i"
 fi
done
```

- A. A list of all files in the current directory
- B. A list of all empty files in the current directory
- C. A list of all non-empty files in the current directory
- D. None of the above

Consider the following shell script. Assume that the script is run with two arguments, `file1.txt` and `file2.txt` (there are no files with this name in the current directory). The user types lines of text finishing with a line containing only the string `end`. Answer the following **four questions**.

```
#!/bin/sh
t=0
g=0
read input
while ["$input" != "end"]
do
 t=`expr $t + 1`
 case "$input" in
 [A-Za-z]) echo "$input" >> $1 ;;
 [0-9]) echo "$input" >> $2 ;;
 *) g=`expr $g + 1`
 esac
 read input
done
echo "$t"
echo "$g"
```

40. (1 point) At the end of the execution, `file1.txt` will contain ...
- A. All files in the current directory whose name starts with a letter.
  - B. All files in the current directory whose name contains a letter.
  - C. All lines entered by the user that started with a letter.
  - D. All lines entered by the user that contained a letter.
  - E. None of the above
41. (1 point) At the end of the execution, `file2.txt` will contain ...
- A. All files in the current directory whose name starts with a number.
  - B. All files in the current directory whose name contains a number.
  - C. All lines entered by the user that started with a number.
  - D. All lines entered by the user that contained a number.
  - E. None of the above
42. (1 point) At the end of the execution, the first line of output will be ...
- A. The number of files in the current directory.
  - B. The number of lines entered by the user excluding the `end` line.
  - C. The number of lines entered by the user including the `end` line.
  - D. None of the above

43. (1 point) At the end of the execution, the second line of output will be ...
- A. The number of files in the current directory whose name does not start with a letter or a digit.
  - B. The number of files in the current directory whose name does not contain a letter or a digit.
  - C. All lines entered by the user that started with a character other than a letter or a digit.
  - D. All lines entered by the user that did not contain any letters or digits.
  - E. None of the above

44. (1 point) Consider the following script.

```
#!/bin/sh
count=1
while test $count -le $#
do
 echo -n "$1"
 count=`expr $count + 1`
 shift
done
```

What will be the output if the script is run with the following arguments: A B C D E

- A. ABC
  - B. ABCD
  - C. ABCDE
  - D. ACE
  - E. None of the above
45. (1 point) Consider the following script.

```
#!/bin/sh
read rel ent
set "$ent"
echo "$1"
```

What will be the output if the script is run with the argument `Unix` and the user types the following: `inherit class1 class2`

- A. `Unix`
- B. `inherit`
- C. `class1`
- D. `class2`
- E. None of the above

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