

Midterm

Duration: 50 minutes
Aids Allowed: None

Make sure that your test has 6 pages (including this one). Write your answers in the spaces provided. You will be rewarded for concise, well-thought-out answers, rather than long ones. Write legibly. Read the questions carefully, and budget your time. Remember that you do not need to include header files in C programs, the “#!” line in shell or Perl programs, or error-handling in any of your programs.

Name: _____ **Section:** 0101

Student #: _____ **TA:** _____

1. _____ / 8
2. _____ / 4
3. _____ / 8
4. _____ / 8
5. _____ / 6

TOTAL: _____ / 34

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Question 1 [8 marks] (5 minutes)

a. [3] How many processes are created when each of the following commands are executed?

```
find $HOME -depth -ctime +7 _____  
ps -axu | grep csh _____  
more *.c > allsource _____
```

b. [3] Suppose file `junk` is in directory `tmpdir`. Put an “X” beside the sets of permissions for `junk` and `tmpdir` that allow `junk` to be removed.

```
tmpdir  junk  
r--    r--  _____  
r--    -w-  _____  
r--    --x  _____  
-w-    r--  _____  
-w-    -w-  _____  
-w-    --x  _____
```

c. [2] Briefly explain what happens when each of the following commands are executed in Bourne shell:

```
ls a/b/c > afile
```

```
grep word afile > bfile 2>&1
```

Question 2 [4 marks] (5-6 minutes)

Consider the following two programs:

ProgA.c

```
int main (void)
{
    int pid, i;

    for(i = 0; i < 2; i++) {
        pid = fork();

        if(pid == 0 ) {
            execl("ProgB", 0);
            printf("Child Done\n");
        } else {
            printf("Parent %d\n", i);
        }
    }
    printf("All Done\n");
}
```

ProgB.c

```
int main (void)
{
    printf("ProgB\n");
}
```

a. [3] Assuming there are no errors, write the output of ProgA.

b. [1] Is this the only correct order the output could have? _____

Question 3 [8 marks] (10-12 minutes)

Write a Bourne shell program that prints the name and size of all files in the current directory that are larger than x bytes, where x is a command line argument. The output will include the names and sizes of files but not directories. Do not use “ls”.

For example, if the program is saved to a file called `bigfiles`, and we run it as “`bigfiles 4096`”, it will list all files larger than 4096 bytes.

(Extra work space below)

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Question 4 [8 marks] (15 minutes)

Write a C program that prints the name and size of all files in the current directory that are larger than 100 Kbytes (1 Kbyte = 1024 bytes). The output will include the names and sizes of files but not directories. No command line arguments are required for this program.

You will find the following macros useful. They apply to the `st_mode` field of the `struct stat`.

`S_ISREG(m)` returns true if a regular file

`S_ISDIR(m)` returns true if a directory

(Extra work space below)

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Question 5 [6 marks] (8-10 minutes)

Since 10-digit dialing arrived in Toronto, I want to update my phone list to include the area code on all local numbers. My phone list contains local 7 digit numbers, North American 10 digit numbers, and some international numbers.

Complete the following Perl program to add the area code 416 to all the local numbers while leaving other phone numbers the same. The file name of the original phone list will be a command line argument, and the new phone list will be printed to standard output. To receive full marks, your program should make as few assumptions as necessary about the format of the name and phone numbers.

Example input and output:

Input		Output	
Sang Xue	011-86-10-6266-7788	Sang Xue	011-86-10-6266-7788
Laura Wilkinson	352-8876	Laura Wilkinson	416-352-8876
Anne Montminy	514-877-7788	Anne Montminy	514-877-7788
Dolores Saez de Ibarra	1-416-887-8876	Dolores Saez de Ibarra	1-416-887-8876

```
#!/local/bin/perl -w
use strict;

# open the phone list file
open PHONES, "<$ARGV[0]" || die "Couldn't open $ARGV[0]\n";
```