CS 213: System Software Lab
Autumn 2023, IIT Dharwad
Assignment-2
Linux and Bash

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1. Write a shell script to generate two text files containing Fibonacci and prime series within the range of 0 to 500. Compare contents of both the files using the "diff" command, and display the percentage of similarity between them.

```
sysad@sysad-OptiPlex-7050:~/Downloads$ bash 1.sh
Percentage of match: 92%
```

2. Create a shell script that employs the "awk" command to extract and display all palindrome numbers from a specified "num.txt" file.

   [Note: Utilize the file we provided named "num.txt".]

```
sysad@sysad-OptiPlex-7050:~/Downloads$ bash 2.sh num.txt
101
111
121
131
141
151
161
171
181
191
202
212
222
232
242
252
262
272
282
292
303
```

3. Write a shell script that establishes an SSH connection to a familiar machine, providing the password as part of the SSH command. Once connected, retrieve and display the hostname of that machine.

[Note: Password should be provided inside the script only]

```
sysad@sysad-OptiPlex-7050:~/bash/assignment$ bash 3.sh
sysad-OptiPlex-7080
```

4. Create a shell script that prints the entire content of a file while excluding the specified range of lines.

   [Note: Utilize the file we provided named “input-1.txt”.]

```
sysad@sysad-OptiPlex-7050:~/bash/assignment$ bash 4.sh input-1.txt 5 6
Line 1: This is the first line.
Line 2: This is the second line.
Line 3: This is the third line.
Line 4: This is the fourth line.
Line 7: This is the seventh line. (Exclude)
Line 8: This is the eighth line. (Exclude)
Line 9: This is the ninth line. (Exclude)
Line 10: This is the tenth line. (Exclude)
Line 11: This is the eleventh line. (Include)
Line 12: This is the twelfth line. (Include)
```

5. Create main.c area.h area1.c area2.c and area3.c. the task of each file are as follows:

   a. area.h: should contain declaration of function circle_area

      `double circle_area(double);`

   b. main.c: Get a number, find the area by calling circle_area(double)

      [Note: should import file area.h]

   c. area1.c: should contain the definition of circle_area function, should compute area based on the formula

      (22 * r * r) / 7

   d. area2.c: same as area1.c but the formula used is

      3.14 * r * r

   e. area3.c: same as area1.c but the formula used is

      3.141592 * r * r

   Write a Makefile to compile the necessary files together using conditional statements, pass the version to be compiled using user macro called `AREAVERSION` (pass values to make: simple, minimal or full; should assign value to macro `fileused` area1.c, area2.c and area3.c respectively)

sample Makefile conditional:

```
ifeq ($(<<your var>>),<<value>>)
      <<Command>>
endif
```

sample compilation command in make target:

```
$(CC) -o main main.c area.h $(fileused).c
```

sample output:

```
$> make AREAVERSION=simple all
gcc -o main main.c area.h area_1.c
$> ./main
Enter a value for circle radius: 45.4
The area of circle is 6477.931429

$> make AREAVERSION=minimal all
gcc -o main main.c area.h area_2.c
$> ./main
Enter a value for circle radius: 45.4
The area of circle is 6472.042400

$> make AREAVERSION=full all
gcc -o main main.c area.h area_3.c
$> ./main
Enter a value for circle radius: 45.4
The area of circle is 6475.323767
```

Instructions:

- Posted on: 29 August 2023
- Due date: 04th September 2023 (11:59PM)
- Suggested Input files (.txt) are available in the drive folder
- Mode of submission is moodle. Any other kind of submissions are not accepted.
- Save all the scripts as:
    - script1.sh,
    - script2.sh etc
- Please zip all your script files, and submit a single file named "<roll-no>.zip", where <roll-no> should be replaced with your IIT Dharwad roll number.
- To be considered for the evaluation without penalty, you have to submit your program by the due date. No single minute relaxation on late submission.
- ***Copying others' programs and allowing others to copy your program are serious offenses and a deserving penalty(100%) will be imposed if found.***