Surname, Name: Section: Student No:

    Closed Book, closed note exam. You are required to write down commands with necessary arguments and options; and make sure that they work. Your script and output should match. Give the best result that you can give!

Each question worths 4 points unless otherwise stated.

Over 100 points is bonus.

Unless otherwise stated for question k, your answers as command must be in k.sh and output should in k.txt both should be in Answers directory. You can combine k.sh's in a single file such as cevaplar.sh

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SIGNATURE   . . . .   Time of Submission:

Prelude: Before solving questions you should:

- let NAME be your FirstLast name as ascii (MAkgul, ASOzgur, LMessi, LionelMessi)

- create NAME and NAME/Answers directories `mkdir -p ~/NAME/Answers`

- script NAME/NAME.Log

- history -c

- download the questions file and unzip it in NAME Directory, (maintaining directory structure), unzip file-path

  cd /NAME

  use wget http://lab4t.ctis.bilkent.edu.tr/download/LabM.zip

- Your working directory could be LabM, files that you operate on will be in LabM. Your answers will be written under NAME; shell scripts and solution files under NAME/Answers; you need to redirect selected output to NAME/Answers directory. You can write your commands within k.sh for question k OR cevaplar.sh/answers.sh by identifying your questions. This will save you time. For most of the questions you should run the necessary command(s), make sure it produces correct output, save the output if necessary in k.txt if k is question number, and save the command in answers.sh using another window/terminal, just copy and paste it.

  When you finish, you will save History and zip NAME directory with commands
  ```
  cd; history > NAME/History.txt
  cd ; zip -ry NAME NAME
  ```

- upload NAME.zip

1. `<GroupA>` apply   `mkdir -p ~/NAME/Answers/Dir{1,2,3,4,5,6,7,8,9,10}` . **For the rest of this question your are located in LabM** (2.5 pts each)

   - copy everything under LabM including directory name into Answers/LabM using **cp**. **You might have hidden files/directories. Give command within LabM and use relative addressing**
   - copy everything in LabM into Dir1 with rsync . Keep owner and date info
   - do it with tar using any auxiliary (tar) file into Dir3. Keep the file under NAME
   - do it with cpio without using any auxiliary file into Dir4

   `</GroupA>`

2. consider all files with name *.txt in LabM hierarchy determine number of lines containing **string Net** case sensitive in all *.txt files

3. find all files with name *.txt under LabM which are newer than file time.stamp and copy them into Dir6 while retaining directory structure

4. Given a.txt, we want to determine the lines containing strings Met or Net and put them in files 4-1.txt, 4-2.txt and 4-3.txt . How would you do it using:(each 1)

   grep: , **sed:**, **awk:**

5. given a.txt, we want to determine non-empty lines and obtain files 5-1.txt, 5-2.txt, and 5-3.txt. How would you do it using: (each 1)

   grep: , **sed:** , **awk:**

6. given a.txt, we want to determine the lines containing only one of Net or Fox, as word, and put them in files 6-1.txt, 6-2.txt and 6-3.txt How would you do it using:(each 2)

   grep: , **sed:** , **awk:**

7. Given a.txt: – determine lines containing string Fox followed by Net, not necessary immediately. 4

8. Given the following file (data.txt) for a certain course

   ```
   lab   mid1 mid2 final   Name (aciklama)
    30    45   70   50     Ali
    40    60   40   80     Ayse
    80    80   60   80     Filiz
    50    40   90   20     Fatma
    60    70   50   70     Elif
   ```

   `aciklama` is for information. It is not part of data.txt

   For each student we want compute weighted sum 0.15*lab+0.20*mid1 + 0.25 * mid2 + 0.4 * final. We want to assign grades as A if sum $\geq$ 80, B if $60 \leq$ sum < 80, and D if sum < 60 (for simplicity). write an Awk script to compute weighted sum, grade and print **name grade** into file 8.txt, and compute and print number of A, B, D's 8 pts

9. Write basic part of rsyncd.conf for public archive **books** which will be stored at /usr/local/book with permissions of user ftp. Public archive means anybody can read and download, but can not upload anything.

10. How would see list of public rsync archives/modules at rsync server ftp.linux.com? How would you download directory pardus/2012/iso/ at rsync archive of ftp.linux.com into iso directory in your home ? Assume your at your home directory. complete the command: `rsync   rsync://ftp.linux.com/ .....`

11. In bilety.com, a message addressed to bilgi@bilety.net, will be distributed as: i) to users: webteam, boss, arge-group, satis-group and reklam-group. Ar-ge group contains alara, ayse, elif, burak; satis-group contains ali, ahmet, sinem, and elif, reklam-group contains deniz, filiz, murat, and webteam contains ali, veli, nese.

    ii)A copy of all mail for satis-group is stored in /home/Logs/satis/Satis.Log, copy of webteam will be stored at /home/Logs/web/Web.Log and all mail for reklam-group stored trough program " /usr/bin/hypermail -f /etc/reklam.cfg"

    iii) a copy of the message is appended to /usr/Logs/bilgi/Bilgi.Log

    iii) message is passed to program /usr/sbin/bin/auto-respond to send an acknowledgment to sender

    Write corresponding entry for /etc/aliases file. $\boxed{\textbf{8 pts}}$

12. On machine ayse.xyz.com you want all mail for user@xyz.com will be stored at mailbox of user. This machine will also host domain bil.com, gokyuzu.net. All mail to gokyuzu.net will be delivered to gokyuzu@gmail.com and to gokyuzu user in the local machine . For domain bil.com, only mail for webmaster@bil.com will be accepted and will be delivered to bilibil user. Write necessary configurations in suitable files: identify files and corresponding lines. $\boxed{\textbf{6 pts}}$

13. Given mail.txt containing e-mail, grade and Full Name of students:

```
ali@ctis.bilkent.edu.tr  A  Ali Veli Net
ayse@gmail.com   B Ayse Kirmizi
fatma@yahoo.com  C  Fatma Maviy Net
burak@hotmail.com D Burak Kara Batmaz
filiz@yandex.com  A Filiz Ali Yazar
ahmet@ug.bilkent.edy.tr C Ali Ahmet Kitap Okur
```

    Write a bash script, say mail.sh, which will read mail.txt and send mail to students with "Subject: your grade", and in the body it will say

```
Dear Ali Veli Net,
Your grade for CTIS123  will be A.
Best Regards

The Management
```

    For the first students. You can use binaries /bin/mail, /bin/mailx, or /usr/sbin/sendmail
    $\boxed{6}$

14. Write conditions for being a free software (özgür yazilim), Be precise as much as possible.

15. Write a Bash script which will take a a set of arguments. For each one it will do the following:
    first print it is name and check whether it exists, if not will give a message and continue.
    If it exists, and if it is directory, it will print output of **du -s DIR**
    If it is file it will print its size.
    If it is a block device it will "It is a block device"
    Else it will print "it is not a file or directory" and continua $\boxed{6}$.

16. **Temizle.sh** We want to write a script for backup and periodic maintenance. Recall that `date +%F` will yield date as in 2015-11-02. The Script will act on some file formats which are newer than **time.stamp**. Script will do several things:

    i) It will look for all mpg3 and mvi files in LabM; will move them into sub directory in `Name/Answers/` directory with name year-month-day .

    ii) It will look odt and doc files under LabM, and put them in a tar file in
    Name/Answers/year-month-day/All-odt-doc.tar

    iii) It will look for all txt files under LabM, and put them in a cpio file in
    Name/Answers/year-month-day/All-txt.cpio

    When all is done, time.stamp is updated to current time. This script will run every Sunday, and Thursday at 0.15 am in September to December; and 1st day of January to August at 1.35 am. Write script Temizle.sh. and specify corresponding cron/at entry. $\boxed{\textbf{6 pts}}$

17. Given elma.txt, compute for each fruit-city pair amount sold as kg, and for each city total fruit sold as TL. **Use associative arrays** $\boxed{6}$

18. suppose you own bilkent.net domain. You have machines ayse.bilkent.net (60.80.90.100), deniz.bilkent.net (80.90.100.120), and filiz.bilkent.net(60.70.70.60). You have contact with ank.bilxyz.com (139.179.139.139), and van.xyz.net.tr (95.95.95.95). You want ayse, deniz, filiz to serve as http://bilkent.net and http://www.bilket.net. Moreover, you want ayse to serve as http://video.bilkent.net and filiz as http://satis.bilkent.net/, and deniz http://anket.bilkent.net/. You want your master DNS/NS server deniz machine and slave machines filiz and van. ayse and deniz be main MX machines and backup will be van and ank machines.

    More over, you want halk sub-domain with NS servers filiz (master) and van (slave).

    Write down complete zone file for bilkent.net $\boxed{\textbf{13 pts}}$

19. write part of named.conf for filiz machine file (using the above info) $\boxed{\textbf{4 pts}}$

20. Write down apache configuration (minimal and complete: directory, index, VirtualHost, Log and webmaster directives) for filiz machine. bilkent.net Web will be on /var/www/web, satis on /usr/local/apache/satis, on all servers . $\boxed{6}$