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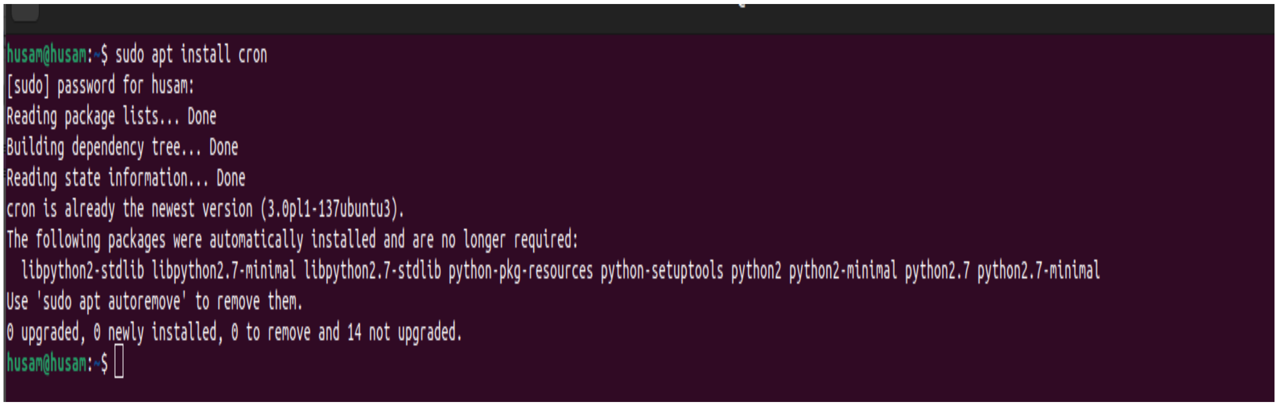
Assignment_Day_1: On a linux server setup a cron job for copying example data with *rsync* periodically.
Ensure the copying is handled in the background and independently of the user session.

Solution:

On the desktop, a main folder called 'Assignment_1' has been created. Inside the folder, two subdirectories named 'original' and 'Backup' were created. The 'original' directory contains 5 files that require transfer to the 'Backup' directory using 'rsync' as a backup mechanism. This transfer must occur automatically every minute using a cron job.

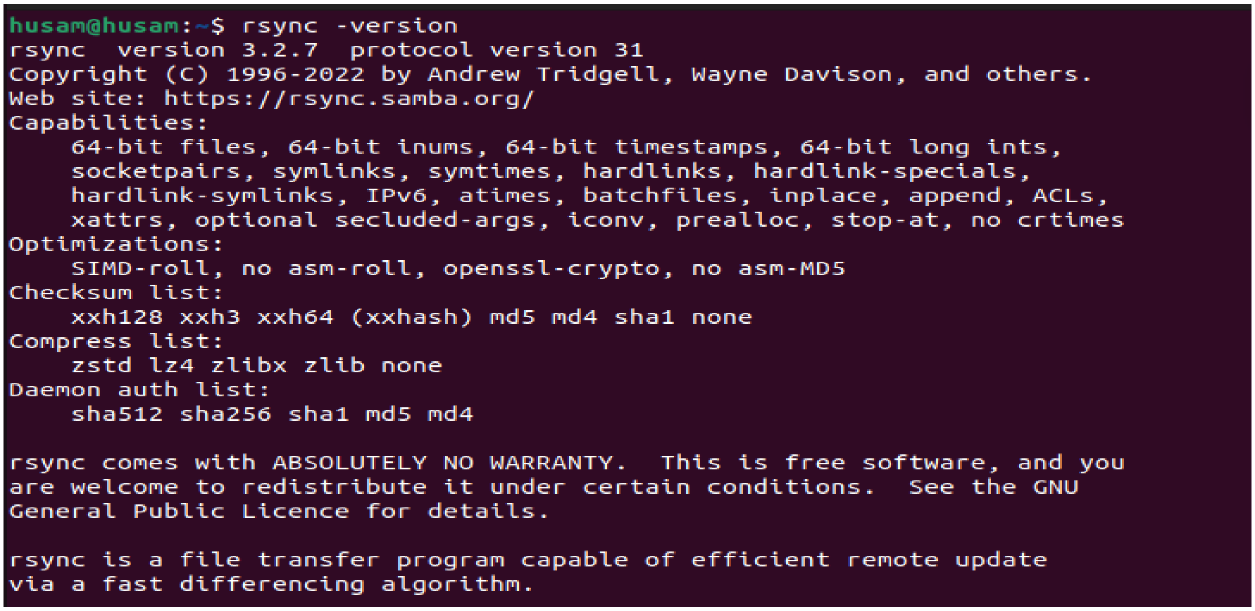
Steps:

1). To ensure that **cron** is installed on the system, the following command can be used:



```
husam@husam:~$ sudo apt install cron
[sudo] password for husam:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
cron is already the newest version (3.0pl1-137ubuntu3).
The following packages were automatically installed and are no longer required:
  libpython2-stdlib libpython2.7-minimal libpython2.7-stdlib python-pkg-resources python-setuptools python2 python2-minimal python2.7 python2.7-minimal
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 14 not upgraded.
husam@husam:~$ 
```

2). We will check version of rsync using $ rsync -version



```
husam@husam:~$ rsync -version
rsync  version 3.2.7  protocol version 31
Copyright (C) 1996-2022 by Andrew Tridgell, Wayne Davison, and others.
Web site: https://rsync.samba.org/
Capabilities:
    64-bit files, 64-bit inums, 64-bit timestamps, 64-bit long ints,
    socketpairs, symlinks, symtimes, hardlinks, hardlink-specials,
    hardlink-symlinks, IPv6, atimes, batchfiles, inplace, append, ACLs,
    xattrs, optional secluded-args, iconv, prealloc, stop-at, no crtimes
Optimizations:
    SIMD-roll, no asm-roll, openssl-crypto, no asm-MD5
Checksum list:
    xxh128 xxh3 xxh64 (xxhash) md5 md4 sha1 none
Compress list:
    zstd lz4 zlibx zlib none
Daemon auth list:
    sha512 sha256 sha1 md5 md4

rsync comes with ABSOLUTELY NO WARRANTY.  This is free software, and you
are welcome to redistribute it under certain conditions.  See the GNU
General Public Licence for details.

rsync is a file transfer program capable of efficient remote update
via a fast differencing algorithm.
```

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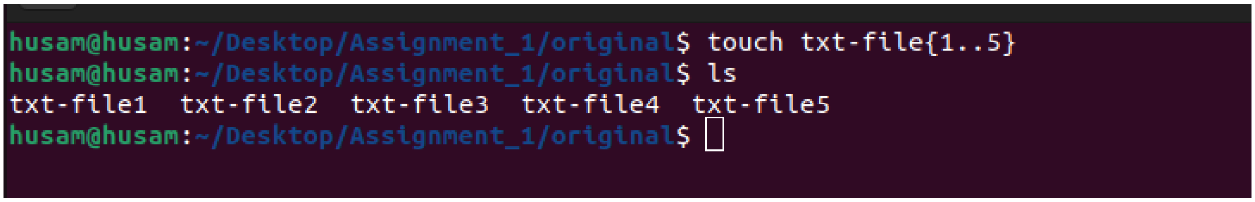
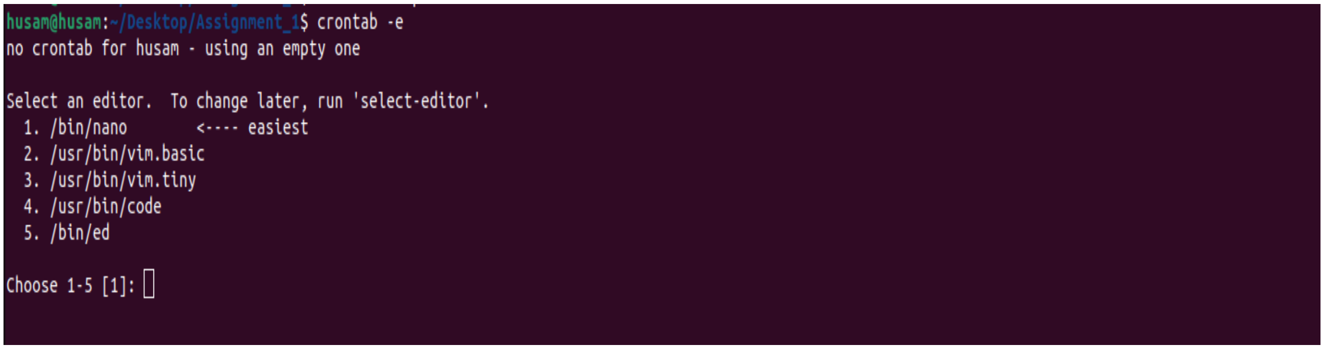
3). A folder named 'Assignment_1' is created on the desktop. Two subfolders named 'original' and 'Backup' are created inside this folder. The command 'touch txt-file{1..5}' is used inside the 'original' folder to create five files. The 'ls' command is then used to list the files.



```
husam@husam:~/Desktop/Assignment_1/original$ touch txt-file{1..5}
husam@husam:~/Desktop/Assignment_1/original$ ls
txt-file1  txt-file2  txt-file3  txt-file4  txt-file5
husam@husam:~/Desktop/Assignment_1/original$ 
```

4).Afterwards, the 'crontab -e' command is used to open the crontab file. Option 1 is chosen to edit the file.

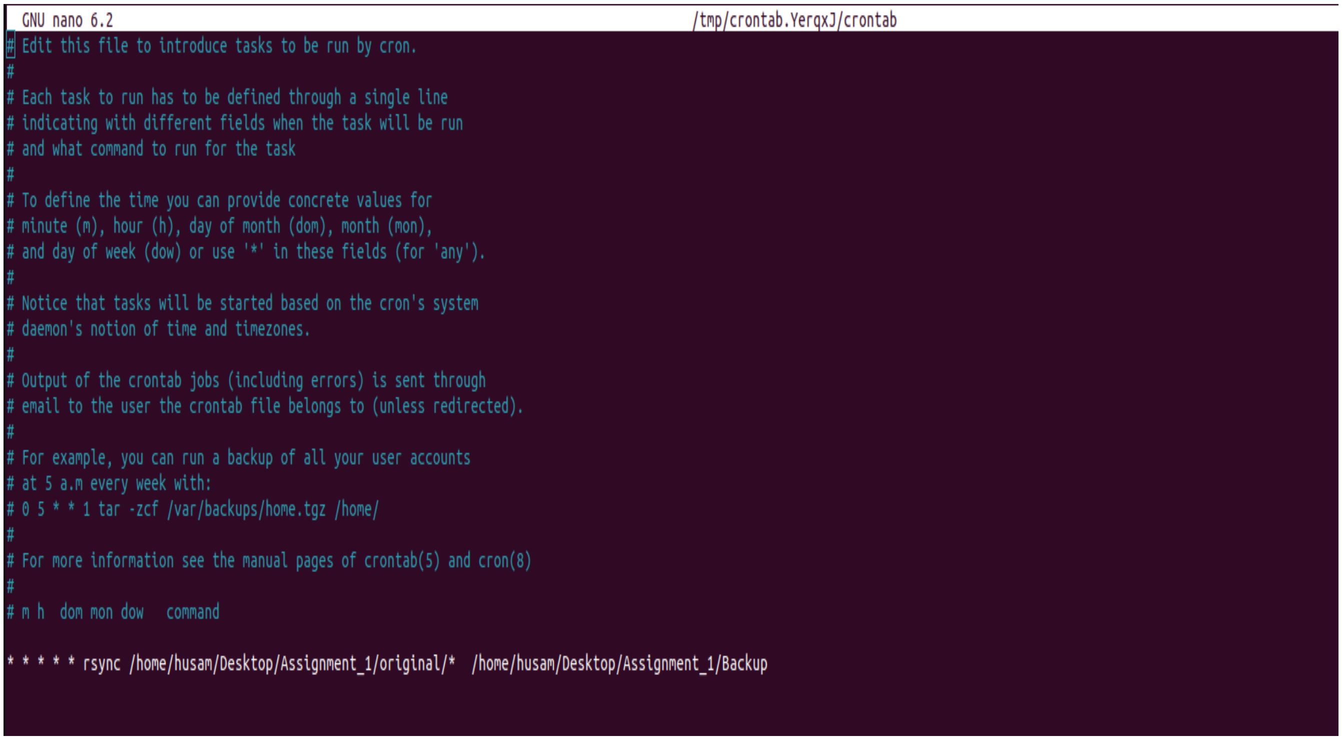


```
husam@husam:~/Desktop/Assignment_1$ crontab -e
no crontab for husam - using an empty one

Select an editor.  To change later, run 'select-editor'.
  1. /bin/nano        <---- easiest
  2. /usr/bin/vim.basic
  3. /usr/bin/vim.tiny
  4. /usr/bin/code
  5. /bin/ed

Choose 1-5 [1]: 
```

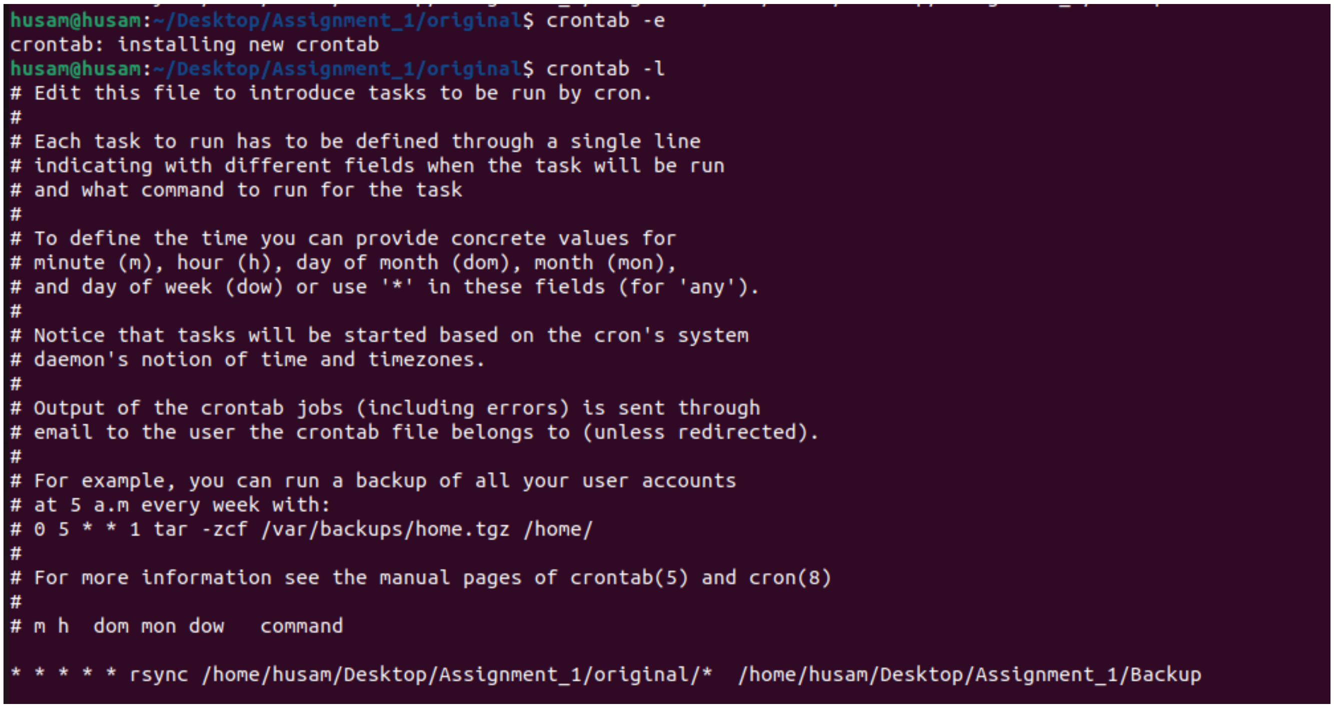
After selecting option 1, the editor is opened and a cron job is written with the 'rsync' command to automate file transfer from the 'original' folder to the 'Backup' folder every minute. The following command is used for this purpose:
 * * * * * rsync /home/husam/Desktop/Assignment_1/original/*
/home/husam/Desktop/Assignment_1/Backup



```
  GNU nano 6.2                                                                  /tmp/crontab.YerqxJ/crontab
# Edit this file to introduce tasks to be run by cron.
#
# Each task to run has to be defined through a single line
# indicating with different fields when the task will be run
# and what command to run for the task
#
# To define the time you can provide concrete values for
# minute (m), hour (h), day of month (dom), month (mon),
# and day of week (dow) or use '*' in these fields (for 'any').
#
# Notice that tasks will be started based on the cron's system
# daemon's notion of time and timezones.
#
# Output of the crontab jobs (including errors) is sent through
# email to the user the crontab file belongs to (unless redirected).
#
# For example, you can run a backup of all your user accounts
# at 5 a.m every week with:
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/
#
# For more information see the manual pages of crontab(5) and cron(8)
#
# m h  dom mon dow   command

* * * * * rsync /home/husam/Desktop/Assignment_1/original/*  /home/husam/Desktop/Assignment_1/Backup
```

We save it and then exit from it , it will set up a cron job to automate file transfer and used crontab –l command to list the contents of the current user's crontab file as show in pic below:



```
husam@husam:~/Desktop/Assignment_1/original$ crontab -e
crontab: installing new crontab
husam@husam:~/Desktop/Assignment_1/original$ crontab -l
# Edit this file to introduce tasks to be run by cron.
#
# Each task to run has to be defined through a single line
# indicating with different fields when the task will be run
# and what command to run for the task
#
# To define the time you can provide concrete values for
# minute (m), hour (h), day of month (dom), month (mon),
# and day of week (dow) or use '*' in these fields (for 'any').
#
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# For more information see the manual pages of crontab(5) and cron(8)
#
# m h  dom mon dow   command

* * * * * rsync /home/husam/Desktop/Assignment_1/original/*  /home/husam/Desktop/Assignment_1/Backup
```
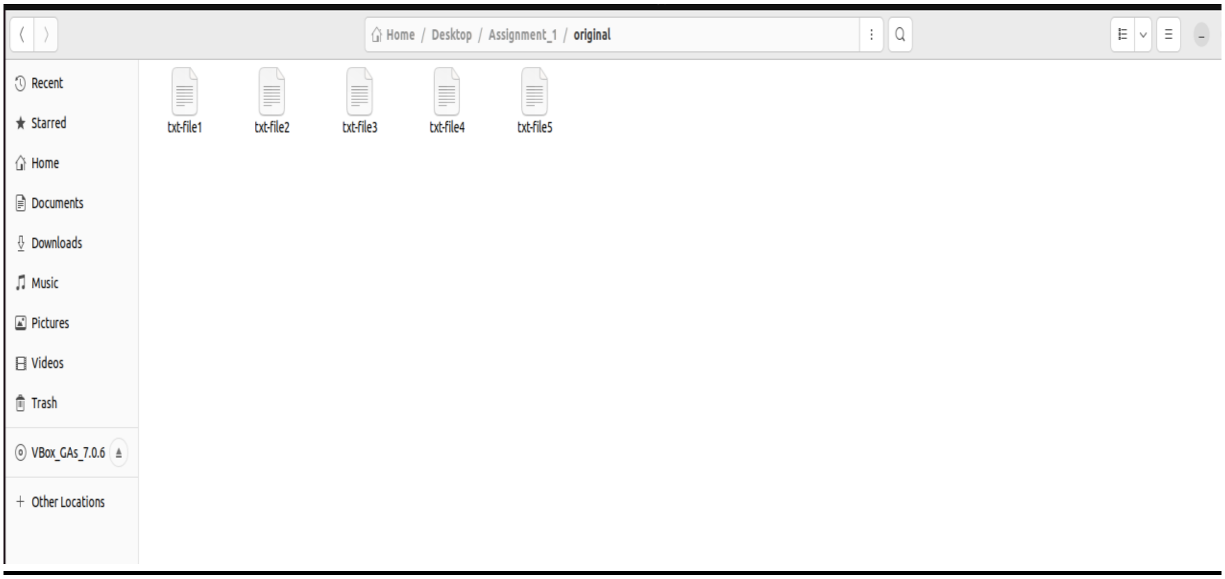
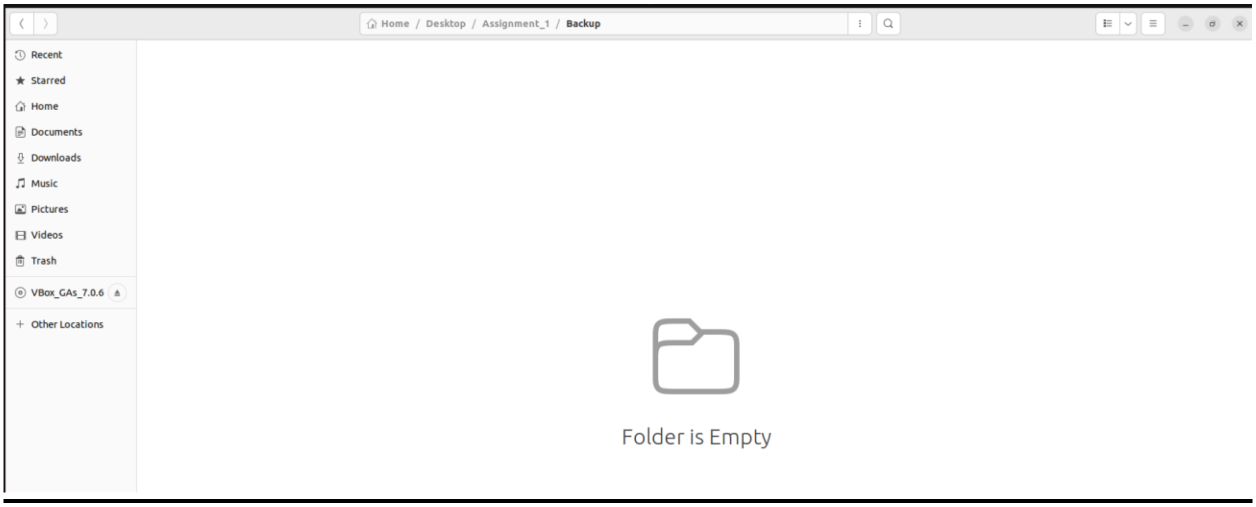

RESULTS/OUTPUT:

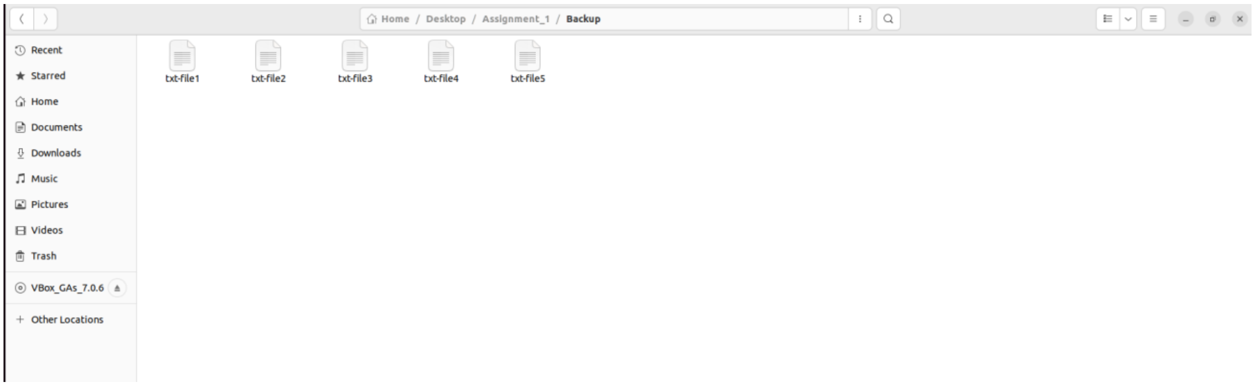
Original folder :



Backup folder :



After execution of cron with async , Backup folder like as:


Home / Desktop / Assignment_1 / Backup
Recent
Starred
Home
Documents
Downloads
Music
Pictures
Videos
Trash
VBox_GAs_7.0.6
Other Locations
txt-file1
txt-file2
txt-file3
txt-file4
txt-file5