1. What does change represent in stat command?

Modify is the timestamp of the last time the file's content has been modified. This is often called MTIME .

Change is the timestamp of the last time the file's inode has been changed, like by changing permissions, ownership, file name, number of hard links. It's often called CTIME .

stat a file

There are 3 kind of timestamps

- Access – the last time the file was read
- Modify – the last time the file was modified (content has been modified)
- Change – the last time metadata of the file was changed (e.g. permissions)

```
        -f      (ignored)

        -h, --no-dereference
                affect  each  symbolic link instead of any referenced file (useful only on
                systems that can change the timestamps of a symlink)

        -m      change only the modification time

        -r, --reference=FILE
                use this file's times instead of current time

        -t STAMP
                use [[CC]YY]MMDDhhmm[.ss] instead of current time

        --time=WORD
                change the specified time: WORD is access, atime, or use: equivalent to -a
                WORD is modify or mtime: equivalent to -m

        --help display this help and exit

        --version
                output version information and exit

        Note that the -d and -t options accept different time-date formats.

DATE STRING
        The  --date=STRING  is  a  mostly  free format human readable date string such as
        "Sun, 29 Feb 2004 16:21:42 -0800" or "2004-02-29 16:21:42" or even  "next  Thurs-
        day".   A  date  string  may contain items indicating calendar date, time of day,
        time zone, day of week, relative time, relative  date,  and  numbers.   An  empty
        string  indicates  the beginning of the day.  The date string format is more com-
        plex than is easily documented here but is fully described in the info documenta-
        tion.

AUTHOR
        Written  by  Paul  Rubin, Arnold Robbins, Jim Kingdon, David MacKenzie, and Randy
        Smith.

REPORTING BUGS
        GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
        Report any translation bugs to <https://translationproject.org/team/>

COPYRIGHT
        Copyright © 2020 Free Software Foundation, Inc.  License GPLv3+: GNU GPL  version
        3 or later <https://gnu.org/licenses/gpl.html>.
        This  is  free software: you are free to change and redistribute it.  There is NO
        WARRANTY, to the extent permitted by law.

SEE ALSO
        Full documentation <https://www.gnu.org/software/coreutils/touch>
        or available locally via: info '(coreutils) touch invocation'

GNU coreutils 8.32              February 2022                               TOUCH(1)
Manual page touch(1) line 27 (press h for help or q to quit)
```

```
himanshu@himanshu:~$ cd Desktop
himanshu@himanshu:~/Desktop$ ls
Github  himanshu
himanshu@himanshu:~/Desktop$ touch touch
himanshu@himanshu:~/Desktop$ ls
Github  himanshu  touch
himanshu@himanshu:~/Desktop$ cd touch
bash: cd: touch: Not a directory
himanshu@himanshu:~/Desktop$ cd touch
bash: cd: touch: Not a directory
himanshu@himanshu:~/Desktop$ cd touch
bash: cd: touch: Not a directory
himanshu@himanshu:~/Desktop$ rm touch
himanshu@himanshu:~/Desktop$ ls
Github  himanshu
himanshu@himanshu:~/Desktop$ touch1
Command 'touch1' not found, did you mean:
  command 'touch' from deb coreutils (8.32-4.1ubuntu1)
Try: sudo apt install <deb name>
himanshu@himanshu:~/Desktop$ touch touch.txt
himanshu@himanshu:~/Desktop$ ls
Github  himanshu  touch.txt
himanshu@himanshu:~/Desktop$ cd touch.txt
bash: cd: touch.txt: Not a directory
himanshu@himanshu:~/Desktop$ ls
Github  himanshu  touch.txt
himanshu@himanshu:~/Desktop$ cd touch.txt
bash: cd: touch.txt: Not a directory
himanshu@himanshu:~/Desktop$ rm touch.txt
himanshu@himanshu:~/Desktop$ ls
Github  himanshu
himanshu@himanshu:~/Desktop$ touch file1
himanshu@himanshu:~/Desktop$ ls
file1  Github  himanshu
himanshu@himanshu:~/Desktop$ cd file1
bash: cd: file1: Not a directory
himanshu@himanshu:~/Desktop$ rm file1
himanshu@himanshu:~/Desktop$ ls
Github  himanshu
himanshu@himanshu:~/Desktop$
himanshu@himanshu:~/Desktop$ mkdir himanshu
mkdir: cannot create directory 'himanshu': File exists
himanshu@himanshu:~/Desktop$
himanshu@himanshu:~/Desktop$ mkdir himanshu
mkdir: cannot create directory 'himanshu': File exists
himanshu@himanshu:~/Desktop$ ls
Github  himanshu
himanshu@himanshu:~/Desktop$ mkdir himanshu2
himanshu@himanshu:~/Desktop$ ls
Github  himanshu  himanshu2
himanshu@himanshu:~/Desktop$ cd himanshu2
himanshu@himanshu:~/Desktop/himanshu2$ ls
himanshu@himanshu:~/Desktop/himanshu2$ touch file1
himanshu@himanshu:~/Desktop/himanshu2$ ls
file1
```

```
himanshu@himanshu:~/Desktop/himanshu2$ ls
file1
himanshu@himanshu:~/Desktop/himanshu2$ rm file1
himanshu@himanshu:~/Desktop/himanshu2$ ls
himanshu@himanshu:~/Desktop/himanshu2$
```

```
himanshu@himanshu:~/Desktop/himanshu2$ ls
himanshu@himanshu:~/Desktop/himanshu2$
```

```
himanshu@himanshu:~/Desktop/himanshu2$ touch test
himanshu@himanshu:~/Desktop/himanshu2$ ls
test
himanshu@himanshu:~/Desktop/himanshu2$ touch m1 m2 m3
himanshu@himanshu:~/Desktop/himanshu2$ ls
m1  m2  m3  test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 0             Blocks: 0          IO Block: 4096   regular empty file
Device: 10307h/66311d   Inode: 2097839      Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-03-11 11:14:44.134443169 +0530
Modify: 2023-03-11 11:14:44.134443169 +0530
Change: 2023-03-11 11:14:44.134443169 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ cat test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 0             Blocks: 0          IO Block: 4096   regular empty file
Device: 10307h/66311d   Inode: 2097839      Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-03-11 11:16:40.375087270 +0530
Modify: 2023-03-11 11:14:44.134443169 +0530
Change: 2023-03-11 11:14:44.134443169 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ echo "newline" >> test
himanshu@himanshu:~/Desktop/himanshu2$ cat test
newline
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8             Blocks: 8          IO Block: 4096   regular file
Device: 10307h/66311d   Inode: 2097839      Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-03-11 11:18:54.934280257 +0530
Modify: 2023-03-11 11:18:38.611360737 +0530
Change: 2023-03-11 11:18:38.611360737 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ ls -l
total 4
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 11:15 m1
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 11:15 m2
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 11:15 m3
-rw-rw-r-- 1 himanshu himanshu 8 Mar 11 11:18 test
himanshu@himanshu:~/Desktop/himanshu2$ touch -a test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8             Blocks: 8          IO Block: 4096   regular file
Device: 10307h/66311d   Inode: 2097839      Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-03-11 11:20:57.970058932 +0530
Modify: 2023-03-11 11:18:38.611360737 +0530
Change: 2023-03-11 11:20:57.970058932 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ touch -m test
```

```
himanshu@himanshu:~/Desktop/himanshu2$ touch -m test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8            Blocks: 8          IO Block: 4096    regular file
Device: 10307h/66311d   Inode: 2097839      Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-03-11 11:20:57.970058932 +0530
Modify: 2023-03-11 11:21:51.450452237 +0530
Change: 2023-03-11 11:21:51.450452237 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ man touch
himanshu@himanshu:~/Desktop/himanshu2$ touch -at 202301010000 01 test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8            Blocks: 8          IO Block: 4096    regular file
Device: 10307h/66311d   Inode: 2097839      Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-01-01 00:00:00.000000000 +0530
Modify: 2023-03-11 11:21:51.450452237 +0530
Change: 2023-03-11 11:26:39.542829445 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ touch -md "2023-01-01 00:00:00.000000000 +0530
" test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8            Blocks: 8          IO Block: 4096    regular file
Device: 10307h/66311d   Inode: 2097839      Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-01-01 00:00:00.000000000 +0530
Modify: 2023-01-01 00:00:00.000000000 +0530
Change: 2023-03-11 11:29:43.610202920 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ ls
01  m1  m2  m3  test
himanshu@himanshu:~/Desktop/himanshu2$ stat m1
  File: m1
  Size: 0            Blocks: 0          IO Block: 4096    regular empty file
Device: 10307h/66311d   Inode: 2097841      Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-03-11 11:15:15.732473915 +0530
Modify: 2023-03-11 11:15:15.732473915 +0530
Change: 2023-03-11 11:15:15.732473915 +0530
 Birth: 2023-03-11 11:15:15.732473915 +0530
himanshu@himanshu:~/Desktop/himanshu2$ touch m1 -r test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8            Blocks: 8          IO Block: 4096    regular file
Device: 10307h/66311d   Inode: 2097839      Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-01-01 00:00:00.000000000 +0530
Modify: 2023-01-01 00:00:00.000000000 +0530
Change: 2023-03-11 11:29:43.610202920 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ stat m1
  File: m1
```

```
Change: 2023-03-11 11:21:51.450452237 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ man touch
himanshu@himanshu:~/Desktop/himanshu2$ touch -at 202301010000 01 test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8            Blocks: 8         IO Block: 4096   regular file
Device: 10307h/66311d   Inode: 2097839    Links: 1
Access: (0664/-rw-rw-r--) Uid: ( 1000/himanshu)  Gid: ( 1000/himanshu)
Access: 2023-01-01 00:00:00.000000000 +0530
Modify: 2023-03-11 11:21:51.450452237 +0530
Change: 2023-03-11 11:26:39.542829445 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ touch -md "2023-01-01 00:00:00.000000000 +0530
" test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8            Blocks: 8         IO Block: 4096   regular file
Device: 10307h/66311d   Inode: 2097839    Links: 1
Access: (0664/-rw-rw-r--) Uid: ( 1000/himanshu)  Gid: ( 1000/himanshu)
Access: 2023-01-01 00:00:00.000000000 +0530
Modify: 2023-01-01 00:00:00.000000000 +0530
Change: 2023-03-11 11:29:43.610202920 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ ls
01  m1  m2  m3  test
himanshu@himanshu:~/Desktop/himanshu2$ stat m1
  File: m1
  Size: 0            Blocks: 0         IO Block: 4096   regular empty file
Device: 10307h/66311d   Inode: 2097841    Links: 1
Access: (0664/-rw-rw-r--) Uid: ( 1000/himanshu)  Gid: ( 1000/himanshu)
Access: 2023-03-11 11:15:15.732473915 +0530
Modify: 2023-03-11 11:15:15.732473915 +0530
Change: 2023-03-11 11:15:15.732473915 +0530
 Birth: 2023-03-11 11:15:15.732473915 +0530
himanshu@himanshu:~/Desktop/himanshu2$ touch m1 -r test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8            Blocks: 8         IO Block: 4096   regular file
Device: 10307h/66311d   Inode: 2097839    Links: 1
Access: (0664/-rw-rw-r--) Uid: ( 1000/himanshu)  Gid: ( 1000/himanshu)
Access: 2023-01-01 00:00:00.000000000 +0530
Modify: 2023-01-01 00:00:00.000000000 +0530
Change: 2023-03-11 11:29:43.610202920 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ stat m1
  File: m1
  Size: 0            Blocks: 0         IO Block: 4096   regular empty file
Device: 10307h/66311d   Inode: 2097841    Links: 1
Access: (0664/-rw-rw-r--) Uid: ( 1000/himanshu)  Gid: ( 1000/himanshu)
Access: 2023-01-01 00:00:00.000000000 +0530
Modify: 2023-01-01 00:00:00.000000000 +0530
Change: 2023-03-11 11:31:31.950756475 +0530
 Birth: 2023-03-11 11:15:15.732473915 +0530
himanshu@himanshu:~/Desktop/himanshu2$
```

2. Difference between change & modification in stat command?

Modify - the last time the file was modified (content has been modified)

Change - the last time metadata of the file was changed (e.g. permissions)

```
himanshu@himanshu:~/Desktop/himanshu2$ touch test
himanshu@himanshu:~/Desktop/himanshu2$ ls
test
himanshu@himanshu:~/Desktop/himanshu2$ touch m1 m2 m3
himanshu@himanshu:~/Desktop/himanshu2$ ls
m1  m2  m3  test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 0              Blocks: 0          IO Block: 4096   regular empty file
Device: 10307h/66311d   Inode: 2097839    Links: 1
Access: (0664/-rw-rw-r--) Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-03-11 11:14:44.134443169 +0530
Modify: 2023-03-11 11:14:44.134443169 +0530
Change: 2023-03-11 11:14:44.134443169 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ cat test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 0              Blocks: 0          IO Block: 4096   regular empty file
Device: 10307h/66311d   Inode: 2097839    Links: 1
Access: (0664/-rw-rw-r--) Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-03-11 11:16:40.375087270 +0530
Modify: 2023-03-11 11:14:44.134443169 +0530
Change: 2023-03-11 11:14:44.134443169 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ echo "newline" >> test
himanshu@himanshu:~/Desktop/himanshu2$ cat test
newline
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8              Blocks: 8          IO Block: 4096   regular file
Device: 10307h/66311d   Inode: 2097839    Links: 1
Access: (0664/-rw-rw-r--) Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-03-11 11:18:54.934280257 +0530
Modify: 2023-03-11 11:18:38.611360737 +0530
Change: 2023-03-11 11:18:38.611360737 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ ls -l
total 4
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 11:15 m1
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 11:15 m2
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 11:15 m3
-rw-rw-r-- 1 himanshu himanshu 8 Mar 11 11:18 test
himanshu@himanshu:~/Desktop/himanshu2$ touch -a test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8              Blocks: 8          IO Block: 4096   regular file
Device: 10307h/66311d   Inode: 2097839    Links: 1
Access: (0664/-rw-rw-r--) Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-03-11 11:20:57.970058932 +0530
Modify: 2023-03-11 11:18:38.611360737 +0530
Change: 2023-03-11 11:20:57.970058932 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ touch -m test
```

```
himanshu@himanshu:~/Desktop/himanshu2$ touch -m test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8              Blocks: 8          IO Block: 4096   regular file
Device: 10307h/66311d   Inode: 2097839    Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-03-11 11:20:57.970058932 +0530
Modify: 2023-03-11 11:21:51.450452237 +0530
Change: 2023-03-11 11:21:51.450452237 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ man touch
himanshu@himanshu:~/Desktop/himanshu2$ touch -at 202301010000 01 test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8              Blocks: 8          IO Block: 4096   regular file
Device: 10307h/66311d   Inode: 2097839    Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-01-01 00:00:00.000000000 +0530
Modify: 2023-03-11 11:21:51.450452237 +0530
Change: 2023-03-11 11:26:39.542829445 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ touch -md "2023-01-01 00:00:00.000000000 +0530
" test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8              Blocks: 8          IO Block: 4096   regular file
Device: 10307h/66311d   Inode: 2097839    Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-01-01 00:00:00.000000000 +0530
Modify: 2023-01-01 00:00:00.000000000 +0530
Change: 2023-03-11 11:29:43.610202920 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ ls
01  m1  m2  m3  test
himanshu@himanshu:~/Desktop/himanshu2$ stat m1
  File: m1
  Size: 0              Blocks: 0          IO Block: 4096   regular empty file
Device: 10307h/66311d   Inode: 2097841    Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-03-11 11:15:15.732473915 +0530
Modify: 2023-03-11 11:15:15.732473915 +0530
Change: 2023-03-11 11:15:15.732473915 +0530
 Birth: 2023-03-11 11:15:15.732473915 +0530
himanshu@himanshu:~/Desktop/himanshu2$ touch m1 -r test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8              Blocks: 8          IO Block: 4096   regular file
Device: 10307h/66311d   Inode: 2097839    Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-01-01 00:00:00.000000000 +0530
Modify: 2023-01-01 00:00:00.000000000 +0530
Change: 2023-03-11 11:29:43.610202920 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ stat m1
  File: m1
```

```
Change: 2023-03-11 11:21:51.450452237 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ man touch
himanshu@himanshu:~/Desktop/himanshu2$ touch -at 202301010000 01 test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8              Blocks: 8       IO Block: 4096   regular file
Device: 10307h/66311d  Inode: 2097839     Links: 1
Access: (0664/-rw-rw-r--) Uid: ( 1000/himanshu)  Gid: ( 1000/himanshu)
Access: 2023-01-01 00:00:00.000000000 +0530
Modify: 2023-03-11 11:21:51.450452237 +0530
Change: 2023-03-11 11:26:39.542829445 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ touch -md "2023-01-01 00:00:00.000000000 +0530
" test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8              Blocks: 8       IO Block: 4096   regular file
Device: 10307h/66311d  Inode: 2097839     Links: 1
Access: (0664/-rw-rw-r--) Uid: ( 1000/himanshu)  Gid: ( 1000/himanshu)
Access: 2023-01-01 00:00:00.000000000 +0530
Modify: 2023-01-01 00:00:00.000000000 +0530
Change: 2023-03-11 11:29:43.610202920 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ ls
01  m1  m2  m3  test
himanshu@himanshu:~/Desktop/himanshu2$ stat m1
  File: m1
  Size: 0              Blocks: 0       IO Block: 4096   regular empty file
Device: 10307h/66311d  Inode: 2097841     Links: 1
Access: (0664/-rw-rw-r--) Uid: ( 1000/himanshu)  Gid: ( 1000/himanshu)
Access: 2023-03-11 11:15:15.732473915 +0530
Modify: 2023-03-11 11:15:15.732473915 +0530
Change: 2023-03-11 11:15:15.732473915 +0530
 Birth: 2023-03-11 11:15:15.732473915 +0530
himanshu@himanshu:~/Desktop/himanshu2$ touch m1 -r test
himanshu@himanshu:~/Desktop/himanshu2$ stat test
  File: test
  Size: 8              Blocks: 8       IO Block: 4096   regular file
Device: 10307h/66311d  Inode: 2097839     Links: 1
Access: (0664/-rw-rw-r--) Uid: ( 1000/himanshu)  Gid: ( 1000/himanshu)
Access: 2023-01-01 00:00:00.000000000 +0530
Modify: 2023-01-01 00:00:00.000000000 +0530
Change: 2023-03-11 11:29:43.610202920 +0530
 Birth: 2023-03-11 11:14:44.134443169 +0530
himanshu@himanshu:~/Desktop/himanshu2$ stat m1
  File: m1
  Size: 0              Blocks: 0       IO Block: 4096   regular empty file
Device: 10307h/66311d  Inode: 2097841     Links: 1
Access: (0664/-rw-rw-r--) Uid: ( 1000/himanshu)  Gid: ( 1000/himanshu)
Access: 2023-01-01 00:00:00.000000000 +0530
Modify: 2023-01-01 00:00:00.000000000 +0530
Change: 2023-03-11 11:31:31.950756475 +0530
 Birth: 2023-03-11 11:15:15.732473915 +0530
himanshu@himanshu:~/Desktop/himanshu2$
```

3. How to create multiple folders and files? Demonstrate with practicality?

The basic command for creating directories in Linux consists of the mkdir command and the name of the directory. As you can add options to this command, the syntax looks like this:

- **Mkdir**

touch command is a way to create empty files (there are some other methods also). You can update the modification and access time of each file with the help of touch command. Syntax: touch <filename>

- **Touch**

```
himanshu@himanshu:~$ pwd
/home/himanshu
himanshu@himanshu:~$ cd Desktop
himanshu@himanshu:~/Desktop$ pwd
/home/himanshu/Desktop
himanshu@himanshu:~/Desktop$ mkdir customers
himanshu@himanshu:~/Desktop$ ls
customers  Github  himanshu  himanshu2
himanshu@himanshu:~/Desktop$ mkdir students
himanshu@himanshu:~/Desktop$ ls
customers  Github  himanshu  himanshu2  students
himanshu@himanshu:~/Desktop$ cd customers
himanshu@himanshu:~/Desktop/customers$ touch index.txt
himanshu@himanshu:~/Desktop/customers$ ls
index.txt
himanshu@himanshu:~/Desktop/customers$ touch names.txt
himanshu@himanshu:~/Desktop/customers$ ls
index.txt  names.txt
himanshu@himanshu:~/Desktop/customers$ touch students.txt
himanshu@himanshu:~/Desktop/customers$ ls
index.txt  names.txt  students.txt
himanshu@himanshu:~/Desktop/customers$
```

```
himanshu@himanshu:~$ pwd
/home/himanshu
himanshu@himanshu:~$ cd Desktop
himanshu@himanshu:~/Desktop$ pwd
/home/himanshu/Desktop
himanshu@himanshu:~/Desktop$ mkdir customers
himanshu@himanshu:~/Desktop$ ls
customers  Github  himanshu  himanshu2
himanshu@himanshu:~/Desktop$ mkdir students
himanshu@himanshu:~/Desktop$ ls
customers  Github  himanshu  himanshu2  students
himanshu@himanshu:~/Desktop$ cd customers
himanshu@himanshu:~/Desktop/customers$ touch index.txt
himanshu@himanshu:~/Desktop/customers$ ls
index.txt
himanshu@himanshu:~/Desktop/customers$ touch names.txt
himanshu@himanshu:~/Desktop/customers$ ls
index.txt   names.txt
himanshu@himanshu:~/Desktop/customers$ touch students.txt
himanshu@himanshu:~/Desktop/customers$ ls
index.txt   names.txt   students.txt
himanshu@himanshu:~/Desktop/customers$ mkdir foder_{A..F}
himanshu@himanshu:~/Desktop/customers$ ls
foder_A   foder_B   foder_C   foder_D   foder_E   foder_F   index.txt   names.txt   students.txt
himanshu@himanshu:~/Desktop/customers$ touch file_{1..5}.txt
himanshu@himanshu:~/Desktop/customers$ ls
file_1.txt   file_3.txt   file_5.txt   foder_B   foder_D   foder_F     names.txt
file_2.txt   file_4.txt   foder_A      foder_C   foder_E   index.txt   students.txt
himanshu@himanshu:~/Desktop/customers$ touch file_{1..8..2}.txt
himanshu@himanshu:~/Desktop/customers$ ls
file_1.txt   file_3.txt   file_5.txt   foder_A   foder_C   foder_E   index.txt   students.txt
file_2.txt   file_4.txt   file_7.txt   foder_B   foder_D   foder_F   names.txt
himanshu@himanshu:~/Desktop/customers$ mkdir folder_{A..f}
himanshu@himanshu:~/Desktop/customers$ ls
 file_1.txt    foder_C      folder__      folder_d   folder_I   folder_Q   folder_Y
 file_2.txt    foder_D     'folder_`'     folder_D   folder_J   folder_R   folder_Z
 file_3.txt    foder_E      folder_a      folder_e   folder_K   folder_S   index.txt
 file_4.txt    foder_F      folder_A      folder_E   folder_L   folder_T   names.txt
 file_5.txt    folder_      folder_b      folder_f   folder_M   folder_U   students.txt
 file_7.txt   'folder_['    folder_B      folder_F   folder_N   folder_V
 foder_A       folder_]     folder_c      folder_G   folder_O   folder_W
 foder_B      'folder_^'    folder_C      folder_H   folder_P   folder_X
himanshu@himanshu:~/Desktop/customers$ touch file_{1..5}.txt
himanshu@himanshu:~/Desktop/customers$ ls
 file_1.txt    foder_C      folder__      folder_d   folder_I   folder_Q   folder_Y
 file_2.txt    foder_D     'folder_`'     folder_D   folder_J   folder_R   folder_Z
 file_3.txt    foder_E      folder_a      folder_e   folder_K   folder_S   index.txt
 file_4.txt    foder_F      folder_A      folder_E   folder_L   folder_T   names.txt
 file_5.txt    folder_      folder_b      folder_f   folder_M   folder_U   students.txt
 file_7.txt   'folder_['    folder_B      folder_F   folder_N   folder_V
 foder_A       folder_]     folder_c      folder_G   folder_O   folder_W
 foder_B      'folder_^'    folder_C      folder_H   folder_P   folder_X
himanshu@himanshu:~/Desktop/customers$
```

```
                            himanshu@himanshu: ~/Desktop/customers
himanshu@himanshu:~/Desktop/customers$ touch file_{1..8..2}.txt
himanshu@himanshu:~/Desktop/customers$ ls
 file_1.txt    foder_C       folder__      folder_d    folder_I    folder_Q    folder_Y
 file_2.txt    foder_D      'folder_`'     folder_D    folder_J    folder_R    folder_Z
 file_3.txt    foder_E       folder_a      folder_e    folder_K    folder_S    index.txt
 file_4.txt    foder_F       folder_A      folder_E    folder_L    folder_T    names.txt
 file_5.txt    folder_       folder_b      folder_f    folder_M    folder_U    students.txt
 file_7.txt   'folder_['     folder_B      folder_F    folder_N    folder_V
 foder_A       folder_]      folder_c      folder_G    folder_O    folder_W
 foder_B      'folder_^'     folder_C      folder_H    folder_P    folder_X
himanshu@himanshu:~/Desktop/customers$
```

4. How to change seconds in timestamp while using touch command? Demonstrate with practicality?

If you have a specific time and date you would like to be used for all the timestamps of a file or directory, touch command will gladly accept a timestamp template with -t command line option. Template for the timestamp is quite thorough .

```
  File: f5
  Size: 0              Blocks: 0          IO Block: 4096    regular empty file
Device: 10307h/66311d   Inode: 1982171    Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-03-11 12:48:01.906999035 +0530
Modify: 2023-03-11 12:48:01.906999035 +0530
Change: 2023-03-11 12:48:01.906999035 +0530
 Birth: 2023-03-11 12:48:01.906999035 +0530
himanshu@himanshu:~/Desktop$ touch -a f5
himanshu@himanshu:~/Desktop$ stat f5
  File: f5
  Size: 0              Blocks: 0          IO Block: 4096    regular empty file
Device: 10307h/66311d   Inode: 1982171    Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-03-11 12:55:17.484073653 +0530
Modify: 2023-03-11 12:48:01.906999035 +0530
Change: 2023-03-11 12:55:17.484073653 +0530
 Birth: 2023-03-11 12:48:01.906999035 +0530
himanshu@himanshu:~/Desktop$ ls
customers  f1  f3  f5     file2  Github    himanshu2
D2         f2  f4  file1  file3  himanshu  students
himanshu@himanshu:~/Desktop$ touch -c new
himanshu@himanshu:~/Desktop$ ls
customers  f1  f3  f5     file2  Github    himanshu2
D2         f2  f4  file1  file3  himanshu  students
himanshu@himanshu:~/Desktop$ ls -l f5
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 12:48 f5
himanshu@himanshu:~/Desktop$ touch -d "21 september 2010" f5
himanshu@himanshu:~/Desktop$ ls -l f5
-rw-rw-r-- 1 himanshu himanshu 0 Sep 21  2010 f5
himanshu@himanshu:~/Desktop$ ls l f3 f4
ls: cannot access 'l': No such file or directory
f3  f4
himanshu@himanshu:~/Desktop$ ls -l f3 f4
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 12:45 f3
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 12:44 f4
himanshu@himanshu:~/Desktop$ touch -r f3 f4
himanshu@himanshu:~/Desktop$ ls -l f3 f4
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 12:45 f3
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 12:45 f4
himanshu@himanshu:~/Desktop$ touch -t "7 days" f3
touch: invalid date format '7 days'
himanshu@himanshu:~/Desktop$ touch -d "7 days" f3
himanshu@himanshu:~/Desktop$ ls -l f3
-rw-rw-r-- 1 himanshu himanshu 0 Mar 18  2023 f3
himanshu@himanshu:~/Desktop$ touch -d " jan 18 13:11" f3
himanshu@himanshu:~/Desktop$ ls -l f3
-rw-rw-r-- 1 himanshu himanshu 0 Jan 18 13:11 f3
himanshu@himanshu:~/Desktop$ touch -t " 230101001 " f3
touch: invalid date format ' 230101001 '
himanshu@himanshu:~/Desktop$ touvh -t "2001182311" f3
Command 'touvh' not found, did you mean:
  command 'touch' from deb coreutils (8.32-4.1ubuntu1)
Try: sudo apt install <deb name>
himanshu@himanshu:~/Desktop$
```

```
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 12:44 f3
himanshu@himanshu:~/Desktop$ touch f3
himanshu@himanshu:~/Desktop$ ls
customers  f1  f2  f3  f4  Github  himanshu  himanshu2  students
himanshu@himanshu:~/Desktop$ ls -l f3
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 12:45 f3
himanshu@himanshu:~/Desktop$ ls
customers  f1  f2  f3  f4  Github  himanshu  himanshu2  students
himanshu@himanshu:~/Desktop$ touch f5
himanshu@himanshu:~/Desktop$ ls
customers  f1  f2  f3  f4  f5  Github  himanshu  himanshu2  students
himanshu@himanshu:~/Desktop$ ls -l f5
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 12:48 f5
himanshu@himanshu:~/Desktop$ ls -ld D2
ls: cannot access 'D2': No such file or directory
himanshu@himanshu:~/Desktop$ touch D2
himanshu@himanshu:~/Desktop$ ls -ld D2
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 12:49 D2
himanshu@himanshu:~/Desktop$ ls -l D2
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 12:49 D2
himanshu@himanshu:~/Desktop$ ls -l D2
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 12:49 D2
himanshu@himanshu:~/Desktop$ ls -ld D2
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 12:49 D2
himanshu@himanshu:~/Desktop$ touch file1 file2 file3
himanshu@himanshu:~/Desktop$ ls
customers  f1  f3  f5      file2  Github    himanshu2
D2         f2  f4  file1  file3  himanshu  students
himanshu@himanshu:~/Desktop$ ls -l f5
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 12:48 f5
himanshu@himanshu:~/Desktop$ ls -ld f5
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 12:48 f5
himanshu@himanshu:~/Desktop$ ls -l f5
-rw-rw-r-- 1 himanshu himanshu 0 Mar 11 12:48 f5
himanshu@himanshu:~/Desktop$ stat f5
  File: f5
  Size: 0           Blocks: 0          IO Block: 4096   regular empty file
Device: 10307h/66311d   Inode: 1982171     Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-03-11 12:48:01.906999035 +0530
Modify: 2023-03-11 12:48:01.906999035 +0530
Change: 2023-03-11 12:48:01.906999035 +0530
 Birth: 2023-03-11 12:48:01.906999035 +0530
himanshu@himanshu:~/Desktop$ touch -a f5
himanshu@himanshu:~/Desktop$ stat f5
  File: f5
  Size: 0           Blocks: 0          IO Block: 4096   regular empty file
Device: 10307h/66311d   Inode: 1982171     Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2023-03-11 12:55:17.484073653 +0530
Modify: 2023-03-11 12:48:01.906999035 +0530
Change: 2023-03-11 12:55:17.484073653 +0530
 Birth: 2023-03-11 12:48:01.906999035 +0530
himanshu@himanshu:~/Desktop$ ls
customers  f1  f3  f5      file2  Github    himanshu2
```

```
himanshu@himanshu:~/Desktop$ ls
customers  f1  f2  f3  Github  himanshu  himanshu2  students
himanshu@himanshu:~/Desktop$ touch f4
himanshu@himanshu:~/Desktop$ ls
customers  f1  f2  f3  f4  Github  himanshu  himanshu2  students
himanshu@himanshu:~/Desktop$
```

5. How to create a directory with read only permission with help mkdir command? Demonstrate with practicality?

The mkdir command in Linux/Unix allows users to create or make new directories. *mkdir* stands for "make directory."

With mkdir, you can also set permissions, create multiple directories (folders) at once, and much more.

This tutorial will show you how to use the mkdir command in Linux.

Prerequisites

- Linux or UNIX-like system.
- Access to a terminal/command line.
- A user with permissions to create and change directory settings.

```
mkdir: cannot create directory 'linux': File exists
himanshu@himanshu:~/Desktop$ mkdir -m777 linux
mkdir: cannot create directory 'linux': File exists
himanshu@himanshu:~/Desktop$ mkdir -m 777 linux
mkdir: cannot create directory 'linux': File exists
himanshu@himanshu:~/Desktop$ mkdir keenable
himanshu@himanshu:~/Desktop$ chmod 444 keenable
himanshu@himanshu:~/Desktop$ ls -l
total 32
drwxrwxr-x 46 himanshu himanshu 4096 Mar 11 12:27 customers
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:49 D2
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:44 f1
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:44 f2
-rw-rw-r--  1 himanshu himanshu    0 Jan 18 13:11 f3
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:45 f4
-rw-rw-r--  1 himanshu himanshu    0 Sep 21  2010 f5
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file1
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file2
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file3
drwxrwxr-x  3 himanshu himanshu 4096 Mar  2 22:04 Github
drwxrwxr-x  3 himanshu himanshu 4096 Mar  3 15:29 himanshu
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 11:26 himanshu2
dr--r--r--  2 himanshu himanshu 4096 Mar 11 14:38 keenable
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 14:36 linux
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 14:32 mydir_123
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 12:21 students
himanshu@himanshu:~/Desktop$




himanshu@himanshu:~/Desktop$ ls
customers   f1  f3  f5      file2  Github      himanshu2  linux       students
D2          f2  f4  file1   file3  himanshu    keenable    mydir_123
himanshu@himanshu:~/Desktop$ chmod 444 keenable
himanshu@himanshu:~/Desktop$ ls -l
total 32
drwxrwxr-x 46 himanshu himanshu 4096 Mar 11 12:27 customers
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:49 D2
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:44 f1
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:44 f2
-rw-rw-r--  1 himanshu himanshu    0 Jan 18 13:11 f3
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:45 f4
-rw-rw-r--  1 himanshu himanshu    0 Sep 21  2010 f5
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file1
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file2
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file3
drwxrwxr-x  3 himanshu himanshu 4096 Mar  2 22:04 Github
drwxrwxr-x  3 himanshu himanshu 4096 Mar  3 15:29 himanshu
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 11:26 himanshu2
```

```
total 32
drwxrwxr-x 46 himanshu himanshu 4096 Mar 11 12:27 customers
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:49 D2
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:44 f1
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:44 f2
-rw-rw-r--  1 himanshu himanshu    0 Jan 18 13:11 f3
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:45 f4
-rw-rw-r--  1 himanshu himanshu    0 Sep 21  2010 f5
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file1
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file2
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file3
drwxrwxr-x  3 himanshu himanshu 4096 Mar  2 22:04 Github
drwxrwxr-x  3 himanshu himanshu 4096 Mar  3 15:29 himanshu
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 11:26 himanshu2
dr--r--r--  2 himanshu himanshu 4096 Mar 11 14:38 keenable
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 14:36 linux
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 14:32 mydir_123
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 12:21 students
himanshu@himanshu:~/Desktop$ mkdir prashant
himanshu@himanshu:~/Desktop$ ls
customers   f1  f3  f5     file2  Github    himanshu2  linux      prashant
D2          f2  f4  file1  file3  himanshu  keenable   mydir_123  students
himanshu@himanshu:~/Desktop$ chmod 231 prashant
himanshu@himanshu:~/Desktop$ ls -l
total 36
drwxrwxr-x 46 himanshu himanshu 4096 Mar 11 12:27 customers
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:49 D2
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:44 f1
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:44 f2
-rw-rw-r--  1 himanshu himanshu    0 Jan 18 13:11 f3
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:45 f4
-rw-rw-r--  1 himanshu himanshu    0 Sep 21  2010 f5
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file1
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file2
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file3
drwxrwxr-x  3 himanshu himanshu 4096 Mar  2 22:04 Github
drwxrwxr-x  3 himanshu himanshu 4096 Mar  3 15:29 himanshu
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 11:26 himanshu2
dr--r--r--  2 himanshu himanshu 4096 Mar 11 14:38 keenable
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 14:36 linux
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 14:32 mydir_123
d-w--wx--x  2 himanshu himanshu 4096 Mar 11 14:44 prashant
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 12:21 students
himanshu@himanshu:~/Desktop$ chmod 111 prashant
himanshu@himanshu:~/Desktop$ ls -l
total 36
drwxrwxr-x 46 himanshu himanshu 4096 Mar 11 12:27 customers
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:49 D2
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:44 f1
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:44 f2
-rw-rw-r--  1 himanshu himanshu    0 Jan 18 13:11 f3
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:45 f4
-rw-rw-r--  1 himanshu himanshu    0 Sep 21  2010 f5
```

```
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:49 D2
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:44 f1
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:44 f2
-rw-rw-r--  1 himanshu himanshu    0 Jan 18 13:11 f3
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:45 f4
-rw-rw-r--  1 himanshu himanshu    0 Sep 21  2010 f5
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file1
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file2
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file3
drwxrwxr-x  3 himanshu himanshu 4096 Mar  2 22:04 Github
drwxrwxr-x  3 himanshu himanshu 4096 Mar  3 15:29 himanshu
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 11:26 himanshu2
dr--r--r--  2 himanshu himanshu 4096 Mar 11 14:38 keenable
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 14:36 linux
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 14:32 mydir_123
d--x--x--x  2 himanshu himanshu 4096 Mar 11 14:44 prashant
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 12:21 students
himanshu@himanshu:~/Desktop$ mkdir -m 444 prashant
mkdir: cannot create directory 'prashant': File exists
himanshu@himanshu:~/Desktop$ mkdir -m231 prashant
mkdir: cannot create directory 'prashant': File exists
himanshu@himanshu:~/Desktop$ mkdir-m777 prashant
mkdir-m777: command not found
himanshu@himanshu:~/Desktop$ chmod 444 prashant
himanshu@himanshu:~/Desktop$ ls -l
total 36
drwxrwxr-x 46 himanshu himanshu 4096 Mar 11 12:27 customers
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:49 D2
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:44 f1
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:44 f2
-rw-rw-r--  1 himanshu himanshu    0 Jan 18 13:11 f3
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:45 f4
-rw-rw-r--  1 himanshu himanshu    0 Sep 21  2010 f5
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file1
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file2
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:51 file3
drwxrwxr-x  3 himanshu himanshu 4096 Mar  2 22:04 Github
drwxrwxr-x  3 himanshu himanshu 4096 Mar  3 15:29 himanshu
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 11:26 himanshu2
dr--r--r--  2 himanshu himanshu 4096 Mar 11 14:38 keenable
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 14:36 linux
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 14:32 mydir_123
dr--r--r--  2 himanshu himanshu 4096 Mar 11 14:44 prashant
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 12:21 students
himanshu@himanshu:~/Desktop$ cd prashant
bash: cd: prashant: Permission denied
himanshu@himanshu:~/Desktop$ cd prashant
bash: cd: prashant: Permission denied
himanshu@himanshu:~/Desktop$ chmod 222 prashant
himanshu@himanshu:~/Desktop$ ls -l
total 36
drwxrwxr-x 46 himanshu himanshu 4096 Mar 11 12:27 customers
-rw-rw-r--  1 himanshu himanshu    0 Mar 11 12:49 D2
```

```
dr--r--r--   2 himanshu himanshu 4096 Mar 11 14:44 prashant
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 12:21 students
himanshu@himanshu:~/Desktop$ cd prashant
bash: cd: prashant: Permission denied
himanshu@himanshu:~/Desktop$ cd prashant
bash: cd: prashant: Permission denied
himanshu@himanshu:~/Desktop$ chmod 222 prashant
himanshu@himanshu:~/Desktop$ ls -l
total 36
drwxrwxr-x 46 himanshu himanshu 4096 Mar 11 12:27 customers
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:49 D2
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:44 f1
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:44 f2
-rw-rw-r--   1 himanshu himanshu    0 Jan 18 13:11 f3
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:45 f4
-rw-rw-r--   1 himanshu himanshu    0 Sep 21  2010 f5
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:51 file1
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:51 file2
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:51 file3
drwxrwxr-x   3 himanshu himanshu 4096 Mar  2 22:04 Github
drwxrwxr-x   3 himanshu himanshu 4096 Mar  3 15:29 himanshu
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 11:26 himanshu2
dr--r--r--   2 himanshu himanshu 4096 Mar 11 14:38 keenable
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 14:36 linux
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 14:32 mydir_123
d-w--w--w-   2 himanshu himanshu 4096 Mar 11 14:44 prashant
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 12:21 students
himanshu@himanshu:~/Desktop$ cd prashant
bash: cd: prashant: Permission denied
himanshu@himanshu:~/Desktop$ chmod 777 prashant
himanshu@himanshu:~/Desktop$ ls -l
total 36
drwxrwxr-x 46 himanshu himanshu 4096 Mar 11 12:27 customers
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:49 D2
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:44 f1
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:44 f2
-rw-rw-r--   1 himanshu himanshu    0 Jan 18 13:11 f3
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:45 f4
-rw-rw-r--   1 himanshu himanshu    0 Sep 21  2010 f5
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:51 file1
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:51 file2
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:51 file3
drwxrwxr-x   3 himanshu himanshu 4096 Mar  2 22:04 Github
drwxrwxr-x   3 himanshu himanshu 4096 Mar  3 15:29 himanshu
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 11:26 himanshu2
dr--r--r--   2 himanshu himanshu 4096 Mar 11 14:38 keenable
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 14:36 linux
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 14:32 mydir_123
drwxrwxrwx   2 himanshu himanshu 4096 Mar 11 14:44 prashant
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 12:21 students
himanshu@himanshu:~/Desktop$ cd prashant
himanshu@himanshu:~/Desktop/prashant$ cd ..
himanshu@himanshu:~/Desktop$
```

```
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 14:32 mydir_123
drwxrwxrwx   2 himanshu himanshu 4096 Mar 11 14:44 prashant
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 12:21 students
himanshu@himanshu:~/Desktop$ cd prashant
himanshu@himanshu:~/Desktop/prashant$ cd ..
himanshu@himanshu:~/Desktop$ mkdir -m777 deepak
himanshu@himanshu:~/Desktop$ ls -lrt
total 40
-rw-rw-r--   1 himanshu himanshu    0 Sep 21  2010 f5
-rw-rw-r--   1 himanshu himanshu    0 Jan 18 13:11 f3
drwxrwxr-x   3 himanshu himanshu 4096 Mar  2 22:04 Github
drwxrwxr-x   3 himanshu himanshu 4096 Mar  3 15:29 himanshu
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 11:26 himanshu2
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 12:21 students
drwxrwxr-x  46 himanshu himanshu 4096 Mar 11 12:27 customers
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:44 f2
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:44 f1
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:45 f4
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:49 D2
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:51 file3
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:51 file2
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:51 file1
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 14:32 mydir_123
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 14:36 linux
dr--r--r--   2 himanshu himanshu 4096 Mar 11 14:38 keenable
drwxrwxrwx   2 himanshu himanshu 4096 Mar 11 14:44 prashant
drwxrwxrwx   2 himanshu himanshu 4096 Mar 11 15:00 deepak
himanshu@himanshu:~/Desktop$ mkdir -m444 dhiraj
himanshu@himanshu:~/Desktop$ ls-l
ls-l: command not found
himanshu@himanshu:~/Desktop$ ls -ltr
total 44
-rw-rw-r--   1 himanshu himanshu    0 Sep 21  2010 f5
-rw-rw-r--   1 himanshu himanshu    0 Jan 18 13:11 f3
drwxrwxr-x   3 himanshu himanshu 4096 Mar  2 22:04 Github
drwxrwxr-x   3 himanshu himanshu 4096 Mar  3 15:29 himanshu
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 11:26 himanshu2
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 12:21 students
drwxrwxr-x  46 himanshu himanshu 4096 Mar 11 12:27 customers
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:44 f2
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:44 f1
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:45 f4
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:49 D2
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:51 file3
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:51 file2
-rw-rw-r--   1 himanshu himanshu    0 Mar 11 12:51 file1
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 14:32 mydir_123
drwxrwxr-x   2 himanshu himanshu 4096 Mar 11 14:36 linux
dr--r--r--   2 himanshu himanshu 4096 Mar 11 14:38 keenable
drwxrwxrwx   2 himanshu himanshu 4096 Mar 11 14:44 prashant
drwxrwxrwx   2 himanshu himanshu 4096 Mar 11 15:00 deepak
dr--r--r--   2 himanshu himanshu 4096 Mar 11 15:01 dhiraj
himanshu@himanshu:~/Desktop$
```

6. How to update the modification time of multiple files at once? Demonstrate with practicality?

In Linux, every single file is associated with timestamps, and every file stores the information of last access time, [last modification time](), and last change time. So, whenever we create a new file, and access or modify an existing file, the timestamps of that file are automatically updated.

In this article, we will cover some useful practical examples of Linux **t**ouch commands. The touch command is a standard program for Unix/Linux operating systems that is used to create, change and modify timestamps of a file.

```
himanshu@himanshu:~/Desktop$ mkdir -m777 deepak
himanshu@himanshu:~/Desktop$ ls -lrt
total 40
-rw-rw-r--  1 himanshu himanshu     0 Sep 21  2010 f5
-rw-rw-r--  1 himanshu himanshu     0 Jan 18 13:11 f3
drwxrwxr-x  3 himanshu himanshu  4096 Mar  2 22:04 Github
drwxrwxr-x  3 himanshu himanshu  4096 Mar  3 15:29 himanshu
drwxrwxr-x  2 himanshu himanshu  4096 Mar 11 11:26 himanshu2
drwxrwxr-x  2 himanshu himanshu  4096 Mar 11 12:21 students
drwxrwxr-x 46 himanshu himanshu  4096 Mar 11 12:27 customers
-rw-rw-r--  1 himanshu himanshu     0 Mar 11 12:44 f2
-rw-rw-r--  1 himanshu himanshu     0 Mar 11 12:44 f1
-rw-rw-r--  1 himanshu himanshu     0 Mar 11 12:45 f4
-rw-rw-r--  1 himanshu himanshu     0 Mar 11 12:49 D2
-rw-rw-r--  1 himanshu himanshu     0 Mar 11 12:51 file3
-rw-rw-r--  1 himanshu himanshu     0 Mar 11 12:51 file2
-rw-rw-r--  1 himanshu himanshu     0 Mar 11 12:51 file1
drwxrwxr-x  2 himanshu himanshu  4096 Mar 11 14:32 mydir_123
drwxrwxr-x  2 himanshu himanshu  4096 Mar 11 14:36 linux
dr--r--r--  2 himanshu himanshu  4096 Mar 11 14:38 keenable
drwxrwxrwx  2 himanshu himanshu  4096 Mar 11 14:44 prashant
drwxrwxrwx  2 himanshu himanshu  4096 Mar 11 15:00 deepak
himanshu@himanshu:~/Desktop$ mkdir -m444 dhiraj
himanshu@himanshu:~/Desktop$ ls-l
ls-l: command not found
himanshu@himanshu:~/Desktop$ ls -ltr
total 44
-rw-rw-r--  1 himanshu himanshu     0 Sep 21  2010 f5
-rw-rw-r--  1 himanshu himanshu     0 Jan 18 13:11 f3
drwxrwxr-x  3 himanshu himanshu  4096 Mar  2 22:04 Github
drwxrwxr-x  3 himanshu himanshu  4096 Mar  3 15:29 himanshu
drwxrwxr-x  2 himanshu himanshu  4096 Mar 11 11:26 himanshu2
drwxrwxr-x  2 himanshu himanshu  4096 Mar 11 12:21 students
drwxrwxr-x 46 himanshu himanshu  4096 Mar 11 12:27 customers
-rw-rw-r--  1 himanshu himanshu     0 Mar 11 12:44 f2
-rw-rw-r--  1 himanshu himanshu     0 Mar 11 12:44 f1
-rw-rw-r--  1 himanshu himanshu     0 Mar 11 12:45 f4
-rw-rw-r--  1 himanshu himanshu     0 Mar 11 12:49 D2
-rw-rw-r--  1 himanshu himanshu     0 Mar 11 12:51 file3
-rw-rw-r--  1 himanshu himanshu     0 Mar 11 12:51 file2
-rw-rw-r--  1 himanshu himanshu     0 Mar 11 12:51 file1
drwxrwxr-x  2 himanshu himanshu  4096 Mar 11 14:32 mydir_123
drwxrwxr-x  2 himanshu himanshu  4096 Mar 11 14:36 linux
dr--r--r--  2 himanshu himanshu  4096 Mar 11 14:38 keenable
drwxrwxrwx  2 himanshu himanshu  4096 Mar 11 14:44 prashant
drwxrwxrwx  2 himanshu himanshu  4096 Mar 11 15:00 deepak
dr--r--r--  2 himanshu himanshu  4096 Mar 11 15:01 dhiraj
himanshu@himanshu:~/Desktop$ ls
customers   deepak   f1  f3  f5      file2   Github    himanshu2  linux      prashant
D2          dhiraj   f2  f4  file1   file3   himanshu  keenable   mydir_123  students
himanshu@himanshu:~/Desktop$ touch -t 202111111250.30 f1 f2 f3 f4
himanshu@himanshu:~/Desktop$ stat fi
stat: cannot statx 'fi': No such file or directory
himanshu@himanshu:~/Desktop$ stat f1
  File: f1
```

```
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 14:32 mydir_123
drwxrwxr-x  2 himanshu himanshu 4096 Mar 11 14:36 linux
dr--r--r--  2 himanshu himanshu 4096 Mar 11 14:38 keenable
drwxrwxrwx  2 himanshu himanshu 4096 Mar 11 14:44 prashant
drwxrwxrwx  2 himanshu himanshu 4096 Mar 11 15:00 deepak
dr--r--r--  2 himanshu himanshu 4096 Mar 11 15:01 dhiraj
himanshu@himanshu:~/Desktop$ ls
customers  deepak   f1  f3  f5     file2  Github    himanshu2  linux      prashant
D2         dhiraj   f2  f4  file1  file3  himanshu  keenable   mydir_123  students
himanshu@himanshu:~/Desktop$ touch -t 202111111250.30 f1 f2 f3 f4
himanshu@himanshu:~/Desktop$ stat fi
stat: cannot statx 'fi': No such file or directory
himanshu@himanshu:~/Desktop$ stat f1
  File: f1
  Size: 0              Blocks: 0          IO Block: 4096   regular empty file
Device: 10307h/66311d   Inode: 1982099    Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2021-11-11 12:50:30.000000000 +0530
Modify: 2021-11-11 12:50:30.000000000 +0530
Change: 2023-03-11 15:30:04.704356835 +0530
 Birth: 2023-03-11 12:44:21.874289145 +0530
himanshu@himanshu:~/Desktop$ stat f1 f2 f3 f4
  File: f1
  Size: 0              Blocks: 0          IO Block: 4096   regular empty file
Device: 10307h/66311d   Inode: 1982099    Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2021-11-11 12:50:30.000000000 +0530
Modify: 2021-11-11 12:50:30.000000000 +0530
Change: 2023-03-11 15:30:04.704356835 +0530
 Birth: 2023-03-11 12:44:21.874289145 +0530
  File: f2
  Size: 0              Blocks: 0          IO Block: 4096   regular empty file
Device: 10307h/66311d   Inode: 1982100    Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2021-11-11 12:50:30.000000000 +0530
Modify: 2021-11-11 12:50:30.000000000 +0530
Change: 2023-03-11 15:30:04.704356835 +0530
 Birth: 2023-03-11 12:44:21.874289145 +0530
  File: f3
  Size: 0              Blocks: 0          IO Block: 4096   regular empty file
Device: 10307h/66311d   Inode: 1982101    Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2021-11-11 12:50:30.000000000 +0530
Modify: 2021-11-11 12:50:30.000000000 +0530
Change: 2023-03-11 15:30:04.704356835 +0530
 Birth: 2023-03-11 12:44:21.874289145 +0530
  File: f4
  Size: 0              Blocks: 0          IO Block: 4096   regular empty file
Device: 10307h/66311d   Inode: 1975926    Links: 1
Access: (0664/-rw-rw-r--)  Uid: ( 1000/himanshu)   Gid: ( 1000/himanshu)
Access: 2021-11-11 12:50:30.000000000 +0530
Modify: 2021-11-11 12:50:30.000000000 +0530
Change: 2023-03-11 15:30:04.704356835 +0530
 Birth: 2023-03-11 12:44:47.668095798 +0530
himanshu@himanshu:~/Desktop$
```