

Roll No:138

Name- Anmol Tripathi

Batch-T23

Lab Assignment 5

Aim: To explore hashdeep tool in kali linux for generating, matching and auditing hash of files.

LO2: Demonstrate key management, distribution and user authentication.

Theory:

What is the need of hashing? List different hashing algorithms.

Need for Hashing:

1. Hashing is a process of converting input data (such as text, files, passwords) into a fixed-size value (hash value or hash code) using a hashing algorithm. Hashing serves several purposes in computer science and cybersecurity:
2. Data Integrity: Hashing can verify whether data has been altered or corrupted. If the hash value of the original data matches the hash value calculated from the received data, it's likely that the data hasn't been tampered with.
3. Password Security: Hashing is used to securely store passwords. Instead of storing plain-text passwords, systems store the hash values of passwords. When a user logs in, the input password's hash is compared with the stored hash.
4. Digital Signatures: Hashing plays a role in creating and verifying digital signatures. A hash value of a message is signed with a private key to create a digital signature, providing authenticity and non-repudiation.
5. Data Structures: Hashing is used in hash tables, which provide efficient data retrieval. Hash functions map keys to indices in an array, allowing quick access to data.

Different Hashing Algorithms:

There are various hashing algorithms, each with its characteristics and use cases. Some commonly used ones are:

1. MD5 (Message Digest Algorithm 5)
2. SHA-1 (Secure Hash Algorithm 1)
3. SHA-256, SHA-384, SHA-512 (Secure Hash Algorithms 256, 384, 512)
4. bcrypt (Adaptive Hashing Algorithm)
5. scrypt (Memory-Hard Function)
6. Argon2 (Winner of Password Hashing Competition)

Write the commands used for generating hash values, matching them with stored hash values and auditing using hashdeep tool.

1. To check the version of Hashdeep - hashdeep -V
2. To display help about hashdeep - hashdeep -h or hashdeep -hh
3. To display the manual page of hashdeep- man hashdeep

4. To display the manual page of any specific hash algorithm supported

by hashdeep- `man md5deep`

By default, hashdeep generates MD5 n SHA256 hash values.

5. To hash a file - `hashdeep filename`

6. If you don't want to display the full path of file in output hash

record- `hashdeep -b filename`

7. To suppress any error messages- `hashdeep -s filename`

8. To apply multiple hash algorithms than default `hashdeep -c md5,sha1,sha256,tiger filename`

9. To hash multiple files (say all text files) using md5

`hashdeep -c md5 *.txt`

10. To hash multiple files (say all text files) using md5 and sha1

`hashdeep -c md5,sha1 *.txt`

11. Hashing block of files- `hashdeep -c md5 -p 100 example.txt`

12. To recursively calculate hash (all files and subdirectories in a specified directory)

`hashdeep -c md5 -r /home/lab006/myfiles`

13. To redirect the output of md5 hash of files to another file

`md5deep *.txt>hashset.txt`

`hashdeep *.txt>hashtext1.txt`

Check the content of output file `cat hashset.txt`

`cat hashtext1.txt`

14. To display output in matching mode

`md5deep -m hashset.txt *`

`hashdeep -m -k hashset1.txt *`

15. To suppress unwanted system msgs/error

`md5deep -m hashset.txt *`

`hashdeep -s -m hashset1.txt *`

No output is displayed if there is no matching hashed file is found.

16. To display all files which are negatively matching use -x option

`Md5deep -s -x hashset.txt *`

`hashdeep -s -x hashset1.txt *`

Forensic auditing can be done using hashdeep tool which means a check to determine if any files in the system are changed due to malware or any normal system operation like update patching.

17. To audit, first create a hashset file and then audit it against the files to be checked if they are modified.

```
hashdeep -c md5,sha1,sha256 -r /home/lab006/myfiles>hashset1.txt
```

```
hashdeep -a -r -k hashset1.txt /home/lab006/myfiles
```

18. Add new file to the directory and audit. It fails.

```
touch /home/lab006/myfiles/newfile.txt
```

```
hashdeep -a -r -k hashset1.txt /home/lab006/myfiles
```

19. To get where it failed use the command with -v option

```
hashdeep -v -a -r -k hashset1.txt /home/lab006/myfiles
```

20. Move one of the files to another directory and audit n see output

```
mv /home/lab006/myfiles/example.txt /tmp
```

```
hashdeep -v -a -r -k hashset1.txt /home/lab006/myfiles
```

21. Rename one of the files and audit n see the output

```
mv /home/lab006/myfiles/lab006.txt /home/lab006/myfiles/lab006.bak
```

```
hashdeep -v -a -r -k hashset1.txt /home/lab006/myfiles
```

22. For verbose output of audit

```
hashdeep -vv -a -r -k hashset1.txt /home/lab006/myfiles
```

```
hashdeep -vvv -a -r -k hashset1.txt /home/lab006/myfiles
```

```
Activities Terminal Fri 11:42
lab1006@lab1006-HP-280-G4-MT-Business-PC: ~

File Edit View Search Terminal Help

lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ sudo apt-get install hashdeep
[sudo] password for lab1006:
Reading package lists... Done
Building dependency tree
Reading state information... Done
hashdeep is already the newest version (4.4-4).
The following packages were automatically installed and are no longer required:
  linux-hwe-5.4-headers-5.4.0-125 linux-hwe-5.4-headers-5.4.0-126
  linux-hwe-5.4-headers-5.4.0-137 linux-hwe-5.4-headers-5.4.0-144
  linux-hwe-5.4-headers-5.4.0-146 linux-hwe-5.4-headers-5.4.0-97
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 252 not upgraded.
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep -V
4.4
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep -h
hashdeep version 4.4 by Jesse Kornblum and Simon Garfinkel.
$ hashdeep [OPTION]... [FILES]...
-c <alg1,[alg2]> - legal values: md5,sha1,sha256,tiger,whirlpool,
-p <size> - piecewise mode. Files are broken into blocks for hashing
-r - recursive mode. All subdirectories are traversed
-d - output in DFXML (Digital Forensics XML)
-k <file> - add a file of known hashes
-a - audit mode. Validates FILES against known hashes. Requires -k
-m - matching mode. Requires -k
-x - negative matching mode. Requires -k
-w - in -m mode, displays which known file was matched
-M and -X act like -m and -x, but display hashes of matching files
-e - compute estimated time remaining for each file
-s - silent mode. Suppress all error messages
-b - prints only the bare name of files; all path information is omitted
-l - print relative paths for filenames
-i/-I - only process files smaller than the given threshold
-o - only process certain types of files. See README/manpage
-v - verbose mode. Use again to be more verbose
-d - output in DFXML; -M FILE - write to FILE.
-j <num> - use num threads (default 6)
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep -man
hashdeep: Multiple processing modes specified.
Try 'hashdeep -h' for more information.
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep -man hashdeep
hashdeep: Multiple processing modes specified.
Try 'hashdeep -h' for more information.
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep sample

lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep -man hashdeep
hashdeep: Multiple processing modes specified.
Try 'hashdeep -h' for more information.
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep -man hashdeep
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep sample
%%%% HASHDEEP-1.0
%% size,md5,sha256,filename
## Invoked from: /home/lab1006
## $ hashdeep sample
641,5d04f50e38dec955210da60d9e8b942,461146587bb2fd1ab06bfb63f78990919e3c7168ec3c372e3b13edf49e395d8,/home/lab1006/sample
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep -b sample
%%%% HASHDEEP-1.0
%% size,md5,sha256,filename
## Invoked from: /home/lab1006
## $ hashdeep -b sample
641,5d04f50e38dec955210da60d9e8b942,518beb8731bb06247aa0fb018bf85cb7fb60932,461146587bb2fd1ab06bfb63f78990919e3c7168ec3c372e3b13edf49e395d8,ddc17f11bde37fb528eef842
e7398812104637650637665,/home/lab1006/sample
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep -c md5 *.txt
%%%% HASHDEEP-1.0
%% size,md5,filename
## Invoked from: /home/lab1006
## $ hashdeep -c md5 aahana.txt abc.txt Akashi.txt Akash2.txt Akash.txt assignment.txt hashset1.txt hashset.txt mad.txt mokshit.txt mokshit.txt new.txt tcplog.txt
85,80f03534c6d5ca8d5a2eb1b5a7d7ee,/home/lab1006/Akash.txt
0153,ad5e4e7165c842d6453251625fed145f,/home/lab1006/aahana.txt
1616,92e61859c84cd08bcc482b6fec49f07,/home/lab1006/Akash2.txt
25,1b085da6e0aa47d1c2cce1f0a72c12fe,/home/lab1006/abc.txt
173,10b851cb5523dec7576ba62159835e1,/home/lab1006/assignment.txt
411,19952ba9ba04e02c78bca38a4dfa11a0,/home/lab1006/hashset.txt
2406,2c9ee46ff7e08729bb75347f40f211d9,/home/lab1006/mokshit1.txt
590,359e0e06a80b507d2c7a891001f75c3,/home/lab1006/Akashi.txt
2966,57252bfcc318f882cb4c79b4db4a444ff,/home/lab1006/tcplog.txt
818,7a3bf2fd0418c9249b6f407a25f47db,/home/lab1006/hashset1.txt
5216,5cdef722d0190f6844834e45800166f,/home/lab1006/mokshit.txt
2440,0b86a3ee61cf88bea3921bf0771e779b,/home/lab1006/mad.txt
19,bd1cf66782091b0f64a2de8585039c8b,/home/lab1006/new.txt
```

```
Activities Terminal Fri 11:42
lab1006@lab1006-HP-280-G4-MT-Business-PC: ~

File Edit View Search Terminal Help
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep -c md5 -p 80 sample
##### HASHDEEP-1.0
##### size,md5,filename
## Invoked from: /home/lab1006
## $ hashdeep -c md5 -p 80 sample
##
80,19a572ed1529142fc802db183fa67eea,/home/lab1006/sample offset 0-79
80,86cf72da9ce84dcee386336cd5ac9231,/home/lab1006/sample offset 80-159
80,b576e4f9a3e8b7678860d32b1e4adf53,/home/lab1006/sample offset 160-239
80,5a63abf337e4af7714b0f7e2ae0ed93,/home/lab1006/sample offset 240-319
80,772b4299b9903a210e0401c7ee270e3,/home/lab1006/sample offset 320-399
80,6d9d9ec4090d6c10254f8da42a5a035,/home/lab1006/sample offset 400-479
80,4a08e53571685f4c0559852da9874cc,/home/lab1006/sample offset 480-559
80,2d4519ff0e852a489af7a19eb16ee2,/home/lab1006/sample offset 560-639
1,68b329da9893e34099c7d8ad5cb9c940,/home/lab1006/sample offset 640-640
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep -c md5 -r /home/lab1006/temp
/home/lab1006/: No such file or directory
/home/lab1006/md5: No such file or directory
##### HASHDEEP-1.0
##### size,md5,sha256,filename
## Invoked from: /home/lab1006
## $ hashdeep -r -c md5 /home/lab1006/temp
##
0,d3bba1aad1b2174ef8f41530a0abcb9d,63d4c9455be8ac9b74804c57d5eb290b9a3475064e8ed6ae9fd40af6b1016a4,/home/lab1006/temp/new1.txt
506,ac723c5c889f5cb3f6124162fd13b1b,fc3e35d4015a2734ab118abe41f75a20e35c2ecc98ee21f1e9f3e38c1753df8,/home/lab1006/temp/s2.txt
322,b563778559f2678f70e0993a9ea5dcd,036aec8c2a11d3542e83bcb3f41f8a5593b197e23f26cf6619c326c805c366,/home/lab1006/temp/s1.txt
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ md5deep *.txt>hashset.txt
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ cat hashset.txt
ad54e7165c842d6453251625fed145f /home/lab1006/aahana.txt
1b085d6e0ba47d1c2cecf0a72c12fe /home/lab1006/abc.txt
80f83534cd5dca8d5a2eb1b5a7d7ee /home/lab1006/Akash.txt
92ee18559c4c4d8bcb482b6fec49f67 /home/lab1006/Akash2.txt
2678365f176268ea0b889850ea4ea4f4 /home/lab1006/hashset.txt
10b851cb5523decdd7576ba62159835e1 /home/lab1006/assignment.txt
359eebeeda89b567d2c7a491001f75c3 /home/lab1006/Akash1.txt
7a3bf72f0418c9249bf40725f47d7b /home/lab1006/hashset1.txt
0b86a3ee01cf88bea3921bf0771e779b /home/lab1006/mad.txt
5cdef722d0190f6844834e45800166f /home/lab1006/mokshit.txt
57252bfcc318f882cb4c79b4db4a44ff /home/lab1006/tcplog.txt
2c9ee46ff7e68729bb75347f40f211d9 /home/lab1006/mokshit1.txt
bd1cf06782091b0f64a2de8585639c8b /home/lab1006/new.txt
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep *.txt>hashtext1.txt
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ cat hashtext1.txt
##### HASHDEEP-1.0
##### size,md5,sha256,filename
## Invoked from: /home/lab1006
## $ hashdeep aahana.txt abc.txt Akash1.txt Akash2.txt Akash.txt assignment.txt hashset.txt mad.txt mokshit1.txt mokshit.txt new.txt tcplog.txt
##
85,08f03534cd5dca8d5a2eb1b5a7d7ee,60eeccf7f06fc8d52d923d30430eed28e970780b8b783603be9c01ec5f7b529ee,/home/lab1006/Akash.txt
590,359eebeeda89b567d2c7a491001f75c3,8f846454451cb03302f11a7f153e7c5711b2cbad916e59e326fb7063bd0e09a,/home/lab1006/Akash1.txt
1616,92ee18559c4c4d8bcb482b6fec49f67,2970792400975539a0b0b12af471abcf46e1fba4580111467843f565b7f779f,/home/lab1006/Akash2.txt
767,c22e2023fab40493d7f7d41e0ec637a9,98128e08f6872d9301d40b50a2b326ac35277eda1cc7363e2d866c8156c952b5,/home/lab1006/hashset.txt
25,10b85d6e0ba47d1c2ccce1f0a72c12fe,390856e3774ba9299817fd25793fd884d449984b5dbb61a666f4cddb5dd300bf,/home/lab1006/abc.txt
8153,ad54e7165c842d6453251625fed145f,44258f1c03463d3ac753c92f8d73c7a8788db9283e7cc8fb205ccd43dd45cb03,/home/lab1006/aahana.txt
818,7a3bf72f0418c9249bf407a25f47d7b,b884ef04bea89ab703e04aeaa0b8b10affef003a6e2228af0d003ba89ade980,/home/lab1006/hashset1.txt
19,bd1cf06782091b0f64a2de8585639c8b,b02930c3df43ab9c0cb07d9ef7a7c87863cd9494ef8a117224af3b26f3,/home/lab1006/new.txt
173,10b851cb5523decdd7576ba62159835e1,a93dcb1fcd5ed0d789cb745fba6419f1887a5b6bb85e2404b5547960e47caac,/home/lab1006/assignment.txt
2440,0b86a3ee01cf88bea3921bf0771e779b,e11d886fd46b4561cc91252fde21251513e4b7283d29e4eb37735b48f69a1,/home/lab1006/mad.txt
2460,2c9ee46ff7e68729bb75347f40f211d9,2cccb1971929963e721d1247a8fc6004013c5e656342d2145ebb59609b4a36,/home/lab1006/mokshit1.txt
5216,5cdef722d0190f6844834e45800166f,19a7681bc7e092b0de4555931ae98894e337d7cb80c9365d0bc710365fe31d4b,/home/lab1006/mokshit.txt
2966,57252bfcc318f882cb4c79b4db4a44ff,45f8c339f1ecd9d8174b23debb3a4f00b9fe04381bdd05682e05a7964bd790e5,/home/lab1006/tcplog.txt
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ md5deep -n hashset.txt *
/home/lab1006/Akash: Is a directory
/home/lab1006/aahana.txt
/home/lab1006/Akash1.txt
/home/lab1006/Akash2.txt
/home/lab1006/assignment.txt
/home/lab1006/abc.txt
/home/lab1006/Desktop: Is a directory
/home/lab1006/Documents: Is a directory
/home/lab1006/Downloads: Is a directory
/home/lab1006/files: Is a directory
/home/lab1006/hashset1.txt
/home/lab1006/Akash.txt
/home/lab1006/madhur2: Is a directory
/home/lab1006/mad.txt
/home/lab1006/Music: Is a directory
/home/lab1006/mokshit1.txt
/home/lab1006/mokshit.txt
/home/lab1006/myfiledecrypte
/home/lab1006/myfiledecrypte
/home/lab1006/Pictures: Is a directory
/home/lab1006/Public: Is a directory
/home/lab1006/PycharmProjects: Is a directory
/home/lab1006/new.txt
/home/lab1006/temp: Is a directory
```

```
Activities Terminal Fri 11:42
lab1006@lab1006-HP-280-G4-MT-Business-PC: ~
File Edit View Search Terminal Help
/home/lab1006/Public: Is a directory
/home/lab1006/PycharmProjects: Is a directory
/home/lab1006/snap: Is a directory
/home/lab1006/temp: Is a directory
/home/lab1006/Templates: Is a directory
/home/lab1006/theHarvester: Is a directory
/home/lab1006/Videos: Is a directory
/home/lab1006/weka.log
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ md5deep -s -x hashset.txt *
Command 'md5deep' not found, did you mean:
  command 'md5deep' from deb hashdeep
Try: sudo apt install <deb name>
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ md5deep -s -x hashset.txt *
/home/lab1006/adityareceiverpublic
/home/lab1006/abc.txt.gpg
/home/lab1006/adityareceiverprivate
/home/lab1006/david1
/home/lab1006/delete
/home/lab1006/david
/home/lab1006/filename
/home/lab1006/examples.desktop
/home/lab1006/hashset.txt
/home/lab1006/M1
/home/lab1006/M2
/home/lab1006/madhur
/home/lab1006/hashtext1.txt
/home/lab1006/mokshitsenderpublic
/home/lab1006/5.png
/home/lab1006/new.txt.gpg
/home/lab1006/plechart.py
/home/lab1006/Raven
/home/lab1006/R1
/home/lab1006/sample
/home/lab1006/mokshitsenderprivate
/home/lab1006/Raven.gpg
/home/lab1006/shikhar4.py
/home/lab1006/R2
/home/lab1006/tushr.py
/home/lab1006/weka.log
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ md5deep -s -x hashset.txt *
/home/lab1006/adityareceiverpublic
/home/lab1006/adityareceiverprivate
/home/lab1006/akash2.txt
/home/lab1006/akash1.txt
/home/lab1006/assignment.txt
/home/lab1006/akash.txt
/home/lab1006/delete
/home/lab1006/david
/home/lab1006/david1
/home/lab1006/hashset1.txt
/home/lab1006/hashset.txt
/home/lab1006/filename
/home/lab1006/hashtext1.txt
/home/lab1006/examples.desktop
/home/lab1006/M1
/home/lab1006/madhur
/home/lab1006/M2
/home/lab1006/mad.txt
/home/lab1006/mokshit1.txt
/home/lab1006/mokshitsenderpublic
/home/lab1006/mokshit.txt
/home/lab1006/myfiledecrypte
/home/lab1006/myfiledecrypted
/home/lab1006/mokshitsenderprivate
/home/lab1006/newSample.txt
/home/lab1006/new.txt
/home/lab1006/new.txt.gpg
/home/lab1006/plechart.py
```

```
Activities Terminal Fri 11:42
lab1006@lab1006-HP-280-G4-MT-Business-PC: ~
hashdeep: Audit failed
Files matched: 2
Files partially matched: 0
Files moved: 0
New files found: 1
Known files not found: 1
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep -v -a -r -k hashset2.txt /home/lab1006/temp
hashdeep: Audit failed
Files matched: 1
Files partially matched: 0
Files moved: 1
New files found: 1
Known files not found: 1
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep -vv -a -r -k hashset2.txt /home/lab1006/temp
/home/lab1006/temp/s132.txt: Moved from /home/lab1006/temp/s1.txt
/home/lab1006/temp/s2.txt: No match
/home/lab1006/temp/s2.txt: Known file not used
hashdeep: Audit failed
Input files examined: 0
Known files expecting: 0
Files matched: 1
Files partially matched: 0
Files moved: 1
New files found: 1
Known files not found: 1
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep -vvv -a -r -k hashset2.txt /home/lab1006/temp
/home/lab1006/temp/s132.txt: Moved from /home/lab1006/temp/s1.txt
/home/lab1006/temp/new1.txt: Ok
/home/lab1006/temp/s2.txt: No match
/home/lab1006/temp/s2.txt: Known file not used
hashdeep: Audit failed
Input files examined: 0
Known files expecting: 0
Files matched: 1
Files partially matched: 0
Files moved: 1
New files found: 1
Known files not found: 1
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ mv /home/lab1006/new1.txt /files
mv: cannot stat '/home/lab1006/new1.txt': No such file or directory
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ mv /home/lab1006/temp/new1.txt /files
mv: cannot move '/home/lab1006/temp/new1.txt' to '/files': Permission denied
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ mv /home/lab1006/temp/new1.txt /home/files
mv: cannot move '/home/lab1006/temp/new1.txt' to '/home/files': Permission denied
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ mv /home/lab1006/temp/new1.txt /new
mv: cannot move '/home/lab1006/temp/new1.txt' to '/new': Permission denied
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ mv /home/lab1006/temp/new1.txt /new/new
mv: cannot move '/home/lab1006/temp/new1.txt' to '/new/new': Permission denied
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ pwd
/home/lab1006
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ mv temp/new1.txt /new
mv: cannot move 'temp/new1.txt' to '/new': Permission denied
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ mv temp/new1.txt new
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep -v -a -r -k hashset2.txt /home/lab1006/temp
hashdeep: Audit failed
Files matched: 0
Files partially matched: 0
Files moved: 1
New files found: 1
Known files not found: 2
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep -vv -a -r -k hashset2.txt /home/lab1006/temp
/home/lab1006/temp/s132.txt: Moved from /home/lab1006/temp/s1.txt
/home/lab1006/temp/s2.txt: No match
/home/lab1006/temp/new1.txt: Known file not used
/home/lab1006/temp/s2.txt: Known file not used
hashdeep: Audit failed
Input files examined: 0
Known files expecting: 0
Files matched: 0
Files partially matched: 0
Files moved: 1
New files found: 1
Known files not found: 2
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ hashdeep -vvv -a -r -k hashset2.txt /home/lab1006/temp
/home/lab1006/temp/s132.txt: Moved from /home/lab1006/temp/s1.txt
/home/lab1006/temp/new1.txt: Known file not used
/home/lab1006/temp/s2.txt: Known file not used
hashdeep: Audit failed
Input files examined: 0
Known files expecting: 0
Files matched: 0
Files partially matched: 0
Files moved: 1
New files found: 1
Known files not found: 2
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$
```

CONCLUSION:

In this experiment we studied the need for hashing and its significance in data verification, security, and data structure optimization. Also different hasdeep commands for generating, matching and auditing hash of files.