

Lab 6: Update Sequence Number (USN) Journaling

What You Need for this lab

- Install Virtualbox : <https://www.virtualbox.org/wiki/Downloads>
- Install Kali 2021.4. : <https://old.kali.org/kali-images/kali-2021.4/>
 - Notes: Suggest You configure the disk size of Kali VM 80G because the size of each leakage cases image is 30G+
- https://www.dropbox.com/sh/3lyzpi7vyod0pfs/AADh2b3TnmMqWZHB1Uzv9_ma?dl=0
- https://ubaltmy.sharepoint.com/:f/g/personal/id31ga53_ubalt_edu/EoJThlUPE85Hm7592HB5sjIBGo4Ht9drLxt9XnwDdnf3PA?e=4Okj4m
- <https://github.com/jschicht/ExtractUsnJrnl>
- Image .dd from Lab 5

Scenario 1

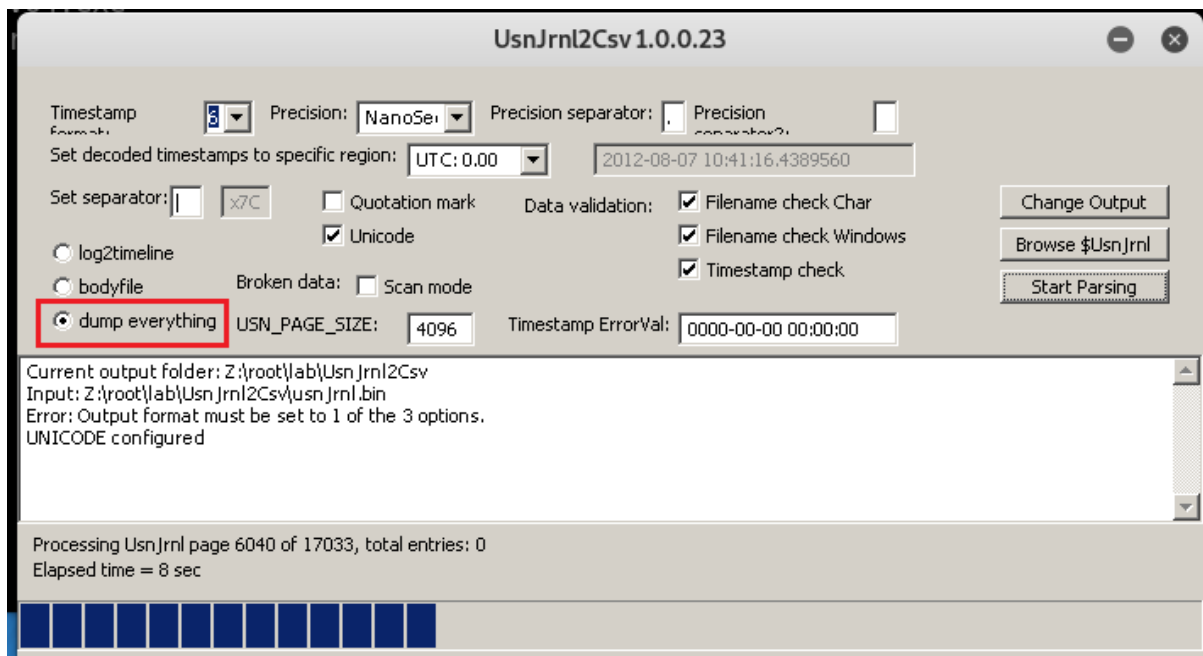
- Install *UsnJrnl2Csv* tool

```
root@kali:~/lab# git clone https://github.com/jschicht/UsnJrnl2Csv.git
Cloning into 'UsnJrnl2Csv'...
remote: Enumerating objects: 176, done.
remote: Total 176 (delta 0), reused 0 (delta 0), pack-reused 176
Receiving objects: 100% (176/176), 12.94 MiB | 4.93 MiB/s, done.
Resolving deltas: 100% (111/111), done.
root@kali:~/lab# icat -i raw -o 206848 cfreds_2015_data_leakage_pc.dd 59016-128-3 > UsnJrnl2Csv/usnJrnl.bin
root@kali:~/lab# ls UsnJrnl2Csv/usnJrnl.bin -l
-rw-r--r-- 1 root root 69767168 Nov 28 11:47 UsnJrnl2Csv/usnJrnl.bin
```

- Run *UsnJrnl2.exe* to covert *UsnJrnl.bin* to .csv

```
root@kali:~/lab# cd UsnJrnl2Csv/
root@kali:~/lab/UsnJrnl2Csv# wine UsnJrnl2Csv64.exe
```

- Set configuration: Browser to *usnJrnl.bin*



- Show the extracted USN journal file

```

root@kali:~/lab/UsnJrnl2Csv#
root@kali:~/lab/UsnJrnl2Csv# ls Usn* -l
-rw-r--r-- 1 root root 46649994 Nov 28 13:01 UsnJrnl_2020-11-28_12-15-14.csv ←
-rw-r--r-- 1 root root 491 Nov 28 13:01 UsnJrnl_2020-11-28_12-15-14.log
-rw-r--r-- 1 root root 915 Nov 28 12:15 UsnJrnl_2020-11-28_12-15-14.sql
-rw-r--r-- 1 root root 1021440 Nov 28 11:45 UsnJrnl2Csv64.exe
-rw-r--r-- 1 root root 63003 Nov 28 11:45 UsnJrnl2Csv.au3
-rw-r--r-- 1 root root 902656 Nov 28 11:45 UsnJrnl2Csv.exe
root@kali:~/lab/UsnJrnl2Csv#

```

```

root@kali:~/lab/UsnJrnl2Csv#
root@kali:~/lab/UsnJrnl2Csv# cat UsnJrnl_2020-11-28_12-15-14.csv | head -n 2
Offset|FileName|USN|Timestamp|Reason|MFTReference|MFTReferenceSeqNo|MFTParentRefer
enceSeqNo|FileAttributes|MajorVersion|MinorVersion|SourceInfo|SecurityId ←
0x01F80000|api-ms-win-core-fibers-l1-1-0.dll|33030144|2015-03-22 15:15:08.2192456|BASIC_INFO_CHANGE+C
LOSE+INDEXABLE_CHANGE|63536|4|63453|4|archive|2|0|0x00000000|0
root@kali:~/lab/UsnJrnl2Csv#

```

- Only show “RENAME_OLD” information of any .jpg files

```

root@kali:~/lab/UsnJrnl2Csv#
root@kali:~/lab/UsnJrnl2Csv# grep -P "\.jpg.*RENAME_OLD" UsnJrnl_2020-11-28_12-15-14.csv --color
0x03D6B8A0|Chrysanthemum.jpg|64404640|2015-03-24 20:11:42.8361742|RENAME_OLD_NAME|74620|285|21921|3|archive|2|0|0x00000000|0
0x03D6B8F8|Desert.jpg|64405352|2015-03-24 20:11:42.8517742|RENAME_OLD_NAME|74625|10|21921|3|archive|2|0|0x00000000|0
0x03D6C528|Hydrangeas.jpg|64406824|2015-03-24 20:11:42.8517742|RENAME_OLD_NAME|74641|10|21921|3|archive|2|0|0x00000000|0
0x03D6CAC8|Jellyfish.jpg|64408264|2015-03-24 20:11:42.8517742|RENAME_OLD_NAME|74656|8|21921|3|archive|2|0|0x00000000|0
0x03D6CD88|Koala.jpg|64408968|2015-03-24 20:11:42.8517742|RENAME_OLD_NAME|74666|10|21921|3|archive|2|0|0x00000000|0
0x03D6D058|Lighthouse.jpg|64409688|2015-03-24 20:11:42.8517742|RENAME_OLD_NAME|74667|16|21921|3|archive|2|0|0x00000000|0
0x03D6D318|Penguins.jpg|64410392|2015-03-24 20:11:42.8517742|RENAME_OLD_NAME|74670|12|21921|3|archive|2|0|0x00000000|0
0x03D6D5D8|Tulips.jpg|64411096|2015-03-24 20:11:42.8517742|RENAME_OLD_NAME|74676|10|21921|3|archive|2|0|0x00000000|0
0x0411B558|Chrysanthemum.jpg|68269400|2015-03-25 15:13:39.1698055|RENAME_OLD_NAME|74620|285|74402|9|not_indexed|2|0|0x00000000|0
0x0411C4F8|Desert.jpg|68273400|2015-03-25 15:13:39.4350055|RENAME_OLD_NAME|74625|10|74402|9|not_indexed|2|0|0x00000000|0
0x0411D268|Hydrangeas.jpg|68276840|2015-03-25 15:13:39.5442055|RENAME_OLD_NAME|74641|10|74402|9|not_indexed|2|0|0x00000000|0
0x0411F570|Jellyfish.jpg|68285888|2015-03-25 15:13:48.8730055|RENAME_OLD_NAME|74656|8|74402|9|not_indexed|2|0|0x00000000|0
0x04120420|Koala.jpg|68289568|2015-03-25 15:13:49.0602055|RENAME_OLD_NAME|74666|10|74402|9|not_indexed|2|0|0x00000000|0
0x041211B8|Lighthouse.jpg|68293048|2015-03-25 15:13:49.2162055|RENAME_OLD_NAME|74667|16|74402|9|not_indexed|2|0|0x00000000|0
0x04122058|Penguins.jpg|68296792|2015-03-25 15:13:49.3566055|RENAME_OLD_NAME|74670|12|74402|9|not_indexed|2|0|0x00000000|0
0x04122EC8|Tulips.jpg|68300488|2015-03-25 15:13:49.4658055|RENAME_OLD_NAME|74676|10|74402|9|not_indexed|2|0|0x00000000|0
root@kali:~/lab/UsnJrnl2Csv#

```

- Only show “RENAME_OLD” information of any .jpg files. Only show three columns, FileName, Timestamp, Reason

```

root@kali:~/lab/UsnJrnl2Csv# /bin/bash 97x35
root@kali:~/lab/UsnJrnl2Csv# awk '{print NR, $2, $4, $5}' FS='|' UsnJrnl_2020-11-28_12-15-14.csv
| grep -E "\.jpg.*RENAME_OLD" --color
261131 Chrysanthemum.jpg 2015-03-24 20:11:42.8361742 RENAME_OLD_NAME
261139 Desert.jpg 2015-03-24 20:11:42.8517742 RENAME_OLD_NAME
261155 Hydrangeas.jpg 2015-03-24 20:11:42.8517742 RENAME_OLD_NAME
261171 Jellyfish.jpg 2015-03-24 20:11:42.8517742 RENAME_OLD_NAME
261179 Koala.jpg 2015-03-24 20:11:42.8517742 RENAME_OLD_NAME
261187 Lighthouse.jpg 2015-03-24 20:11:42.8517742 RENAME_OLD_NAME
261195 Penguins.jpg 2015-03-24 20:11:42.8517742 RENAME_OLD_NAME
261203 Tulips.jpg 2015-03-24 20:11:42.8517742 RENAME_OLD_NAME
299494 Chrysanthemum.jpg 2015-03-25 15:13:39.1698055 RENAME_OLD_NAME
299536 Desert.jpg 2015-03-25 15:13:39.4350055 RENAME_OLD_NAME
299578 Hydrangeas.jpg 2015-03-25 15:13:39.5442055 RENAME_OLD_NAME
299665 Jellyfish.jpg 2015-03-25 15:13:48.8730055 RENAME_OLD_NAME
299707 Koala.jpg 2015-03-25 15:13:49.0602055 RENAME_OLD_NAME
299749 Lighthouse.jpg 2015-03-25 15:13:49.2162055 RENAME_OLD_NAME
299791 Penguins.jpg 2015-03-25 15:13:49.3566055 RENAME_OLD_NAME
299833 Tulips.jpg 2015-03-25 15:13:49.4658055 RENAME_OLD_NAME
root@kali:~/lab/UsnJrnl2Csv#

```

- Show what has happened around a specific time with the same MFT reference #

```

# grep "2015-03-24 20:11.*|74620|" UsnJrnl_2021-10-12_12-36-58.csv
0x03D6BCA0|Chrysanthemum.jpg|64404640|2015-03-24 20:11:42.8361742|RENAME_OLD_NAME|74620|285|21921|3|archive|2|0|0x00000000|0
0x03D6BD00|$RKXD1U3.jpg|64404736|2015-03-24 20:11:42.8361742|RENAME_NEW_NAME|74620|285|15721|2|archive|2|0|0x00000000|0
0x03D6BD58|$RKXD1U3.jpg|64404824|2015-03-24 20:11:42.8361742|CLOSE+RENAME_NEW_NAME|74620|285|15721|2|archive|2|0|0x00000000|0
0x03D6BDB0|$RKXD1U3.jpg|64404912|2015-03-24 20:11:42.8361742|SECURITY_CHANGE|74620|285|15721|2|archive|2|0|0x00000000|0
0x03D6BE08|$RKXD1U3.jpg|64405000|2015-03-24 20:11:42.8361742|CLOSE+SECURITY_CHANGE|74620|285|15721|2|archive|2|0|0x00000000|0

```

Scenario 2

- Install *usncarve* tool (note we have changed the path)

```

root@kali:~/lab# /bin/bash 101x24
root@kali:~/lab# pip install usncarve
Collecting usncarve
  Downloading https://files.pythonhosted.org/packages/80/28/58556680cf9861f86/usncarve-1.2.2.tar.gz
Building wheels for collected packages: usncarve
  Running setup.py bdist_wheel for usncarve ... done
  Stored in directory: /root/.cache/pip/wheels/f7/f3/ea/2d3af0
Successfully built usncarve
Installing collected packages: usncarve
Successfully installed usncarve-1.2.2
root@kali:~/lab#

```

```
(kali㉿kali)-[~/lab6]
# pip3 install usncarve
Collecting usncarve
  Downloading usncarve-1.2.2.tar.gz (2.8 kB)
  Installing build dependencies ... done
  Getting requirements to build wheel ... done
  Preparing metadata (pyproject.toml) ... done
Building wheels for collected packages: usncarve
  Building wheel for usncarve (pyproject.toml) ... done
  Created wheel for usncarve: filename=usncarve-1.2.2-py3-none-any.whl size=2
953 sha256=d6e4d92c37c4dc22d357fb874d919723fd147e79515733d5f5945dc6cca1d6
  Stored in directory: /root/.cache/pip/wheels/e8/18/e8/5d4c1044c25c444be6265
7edcd09f368ac4519e61a043c74c6
Successfully built usncarve
Installing collected packages: usncarve
Successfully installed usncarve-1.2.2
```

- Verify installation

```
root@kali:~/lab# /bin/bash 101x24
root@kali:~/lab# usncarve.py -h
usage: usncarve.py [-h] -f FILE -o OUTFILE

optional arguments:
  -h, --help            show this help message and exit
  -f FILE, --file FILE  Carve USN records from the given file
  -o OUTFILE, --outfile OUTFILE
                        Output to the given file
root@kali:~/lab#
```

```
(kali㉿kali)-[~/lab6]
# usncarve.py -h
usage: usncarve.py [-h] -f FILE -o OUTFILE

options:
  -h, --help            show this help message and exit
  -f, --file FILE       Carve USN records from the given file
  -o, --outfile OUTFILE
                        Output to the given file
```

- Install usnparser tool


```

root@kali:~/lab#
root@kali:~/lab# pip install usnparser
Collecting usnparser
  Downloading https://files.pythonhosted.org/packages/d
79ea5f41cbaf92726dc/usnparser-4.0.3.tar.gz
Building wheels for collected packages: usnparser
  Running setup.py bdist_wheel for usnparser ... done
  Stored in directory: /root/.cache/pip/wheels/49/a4/ad
7db84
Successfully built usnparser
Installing collected packages: usnparser
Successfully installed usnparser-4.0.3
root@kali:~/lab#

```

```

(kali@kali) - [~/lab6]
# pip3 install usnparser
Collecting usnparser
  Downloading usnparser-4.1.5.tar.gz (6.1 kB)
  Installing build dependencies ... done
  Getting requirements to build wheel ... done
  Preparing metadata (pyproject.toml) ... done
Building wheels for collected packages: usnparser
  Building wheel for usnparser (pyproject.toml) ... done
  Created wheel for usnparser: filename=usnparser-4.1.5-py3-none-any.whl size
=5617 sha256=aee6d75195ce8e4cbf351921cbd49fc06217f833767f315684a7264caf9d114c
  Stored in directory: /root/.cache/pip/wheels/c9/8d/4d/3384811dedf2dd3fff3e6
1e45f5428ff8d83e6543916e5af36
Successfully built usnparser
Installing collected packages: usnparser
Successfully installed usnparser-4.1.5

```

- Verify installation

```

root@kali:~/lab#
root@kali:~/lab# usn.py -h
usage: usn.py [-h] [-b] [-c] -f FILE -o OUTFILE [-s SYSTEM] [-t] [-v]

optional arguments:
  -h, --help            show this help message and exit
  -b, --body            Return USN records in comma-separated format
  -c, --csv            Return USN records in comma-separated format
  -f FILE, --file FILE  Parse the given USN journal file
  -o OUTFILE, --outfile OUTFILE
                        Parse the given USN journal file
  -s SYSTEM, --system SYSTEM
                        System name (use with -t)
  -t, --tln            TLN ou2tput (use with -s)
  -v, --verbose        Return all USN properties for each record (JSON)
root@kali:~/lab#

```

```
(kali㉿kali)-[~/lab6]
# usn.py -h
usage: usn.py [-h] [-b] [-c] -f FILE -o OUTFILE [-s SYSTEM] [-t] [-v]

options:
  -h, --help            show this help message and exit
  -b, --body            Return USN records in comma-separated format
  -c, --csv             Return USN records in comma-separated format
  -f, --file FILE       Parse the given USN journal file
  -o, --outfile OUTFILE Parse the given USN journal file
  -s, --system SYSTEM   System name (use with -t)
  -t, --tln             TLN ou2tput (use with -s)
  -v, --verbose         Return all USN properties for each record (JSON)
```

- `usncarve.py -f input file -o output file`

```
/bin/bash 101x24
root@kali:~/lab#
root@kali:~/lab# usncarve.py -f cfreds_2015_data_leakage_pc.dd -o usn.raw
root@kali:~/lab#
root@kali:~/lab# ls -l usn.raw
-rw-r--r-- 1 root root 46465030 Nov 25 20:06 usn.raw
root@kali:~/lab#
```

```
(kali㉿kali)-[~/lab6]
# usncarve.py -f cfreds_2015_data_leakage_pc.dd -o usn.raw

(kali㉿kali)-[~/lab6]
# ls -l usn.raw
-rw-r--r-- 1 root root 46465030 Jun 19 07:17 usn.raw
```

- `usn.py -f input file -o output file`

```
/bin/bash 101x24
root@kali:~/lab#
root@kali:~/lab# usn.py -f usn.raw -o usn.csv
root@kali:~/lab#
root@kali:~/lab# ls -l usn.csv
-rw-r--r-- 1 root root 40899888 Nov 25 20:08 usn.csv ←
root@kali:~/lab#
```

```
(kali㉿kali)-[~/lab6]
# usn.py -f usn.raw -o usn.csv
/root/lab/venv/bin/usn.py:139: DeprecationWarning: datetime.datetime.utcnow() is deprecated and scheduled for removal in a future version. Use timezone-aware objects to represent datetimes in UTC: datetime.datetime.fromtimestamp(timestamp, datetime.UTC).
  return str(datetime.datetime.utcnow().timestamp() * 1e-7 - 11644473600))

(kali㉿kali)-[~/lab6]
# ls -l usn.csv
-rw-r--r-- 1 root root 40899888 Jun 19 07:19 usn.csv
```

- View renamed files

```

root@kali:~/lab# /bin/bash 120x24
root@kali:~/lab# cat usn.csv | grep -i rename | head
2015-03-22 15:14:17.097954 | edb0043D.log | ARCHIVE NOT_CONTENT_INDEXED | RENAME_OLD_NAME
2015-03-22 15:14:17.097954 | edbtmp.log | ARCHIVE NOT_CONTENT_INDEXED | RENAME_NEW_NAME
2015-03-22 15:14:17.097954 | edbtmp.log | ARCHIVE NOT_CONTENT_INDEXED | RENAME_NEW_NAME CLOSE
2015-03-22 15:14:17.097954 | edb.log | ARCHIVE NOT_CONTENT_INDEXED | RENAME_OLD_NAME
2015-03-22 15:14:17.097954 | edb0044E.log | ARCHIVE NOT_CONTENT_INDEXED | RENAME_NEW_NAME
2015-03-22 15:14:17.097954 | edb0044E.log | ARCHIVE NOT_CONTENT_INDEXED | RENAME_NEW_NAME CLOSE
2015-03-22 15:14:17.113554 | edbtmp.log | ARCHIVE NOT_CONTENT_INDEXED | RENAME_OLD_NAME
2015-03-22 15:14:17.113554 | edb.log | ARCHIVE NOT_CONTENT_INDEXED | RENAME_NEW_NAME
2015-03-22 15:14:17.113554 | edb.log | ARCHIVE NOT_CONTENT_INDEXED | RENAME_NEW_NAME CLOSE
2015-03-22 15:14:18.174358 | edb.log | ARCHIVE NOT_CONTENT_INDEXED | RENAME_OLD_NAME
root@kali:~/lab#
root@kali:~/lab# cat usn.csv | grep -i rename | wc -l
46
root@kali:~/lab#

```

```

(kali@kali)-[~/lab6]
└─# cat usn.csv | grep -i rename | head
grep: (standard input): binary file matches
2015-03-22 15:14:17.097954 | edb0043D.log | ARCHIVE NOT_CONTENT_INDEXED | REN
AME_OLD_NAME
2015-03-22 15:14:17.097954 | edbtmp.log | ARCHIVE NOT_CONTENT_INDEXED | RENAM
E_NEW_NAME
2015-03-22 15:14:17.097954 | edbtmp.log | ARCHIVE NOT_CONTENT_INDEXED | RENAM
E_NEW_NAME CLOSE
2015-03-22 15:14:17.097954 | edb.log | ARCHIVE NOT_CONTENT_INDEXED | RENAME_O
LD_NAME
2015-03-22 15:14:17.097954 | edb0044E.log | ARCHIVE NOT_CONTENT_INDEXED | REN
AME_NEW_NAME
2015-03-22 15:14:17.097954 | edb0044E.log | ARCHIVE NOT_CONTENT_INDEXED | REN
AME_NEW_NAME CLOSE
2015-03-22 15:14:17.113554 | edbtmp.log | ARCHIVE NOT_CONTENT_INDEXED | RENAM
E_OLD_NAME
2015-03-22 15:14:17.113554 | edb.log | ARCHIVE NOT_CONTENT_INDEXED | RENAME_N
EW_NAME
2015-03-22 15:14:17.113554 | edb.log | ARCHIVE NOT_CONTENT_INDEXED | RENAME_N
EW_NAME CLOSE
2015-03-22 15:14:18.174358 | edb.log | ARCHIVE NOT_CONTENT_INDEXED | RENAME_O
LD_NAME

(kali@kali)-[~/lab6]
└─# cat usn.csv | grep -i rename | wc -l
grep: (standard input): binary file matches
45

```



```
root@kali:~/lab#  
root@kali:~/lab# grep --text -P "\.jpg.*RENAME_OLD" usn.csv --color  
2015-03-25 15:13:39.169804 | Chrysanthemum.jpg | NOT_CONTENT_INDEXED | RENAME_OLD_NAME  
2015-03-25 15:13:39.435003 | Desert.jpg | NOT_CONTENT_INDEXED | RENAME_OLD_NAME  
2015-03-25 15:13:39.544205 | Hydrangeas.jpg | NOT_CONTENT_INDEXED | RENAME_OLD_NAME  
2015-03-25 15:13:48.873005 | Jellyfish.jpg | NOT_CONTENT_INDEXED | RENAME_OLD_NAME  
2015-03-25 15:13:49.060204 | Koala.jpg | NOT_CONTENT_INDEXED | RENAME_OLD_NAME  
2015-03-25 15:13:49.216204 | Lighthouse.jpg | NOT_CONTENT_INDEXED | RENAME_OLD_NAME  
2015-03-25 15:13:49.356604 | Penguins.jpg | NOT_CONTENT_INDEXED | RENAME_OLD_NAME  
2015-03-25 15:13:49.465805 | Tulips.jpg | NOT_CONTENT_INDEXED | RENAME_OLD_NAME  
2015-03-24 20:11:42.836174 | Chrysanthemum.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Desert.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Hydrangeas.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Jellyfish.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Koala.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Lighthouse.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Penguins.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Tulips.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.836174 | Chrysanthemum.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Desert.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Hydrangeas.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Jellyfish.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Koala.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Lighthouse.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Penguins.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Tulips.jpg | ARCHIVE | RENAME_OLD_NAME
```

```
(kali@kali)-[~/lab6]  
# grep --text -P "\.jpg.*RENAME_OLD" usn.csv --color  
2015-03-25 15:13:39.169804 | Chrysanthemum.jpg | NOT_CONTENT_INDEXED | RENAME_OLD_NAME  
2015-03-25 15:13:39.435003 | Desert.jpg | NOT_CONTENT_INDEXED | RENAME_OLD_NAME  
2015-03-25 15:13:39.544205 | Hydrangeas.jpg | NOT_CONTENT_INDEXED | RENAME_OLD_NAME  
2015-03-25 15:13:48.873005 | Jellyfish.jpg | NOT_CONTENT_INDEXED | RENAME_OLD_NAME  
2015-03-25 15:13:49.060204 | Koala.jpg | NOT_CONTENT_INDEXED | RENAME_OLD_NAME  
2015-03-25 15:13:49.216204 | Lighthouse.jpg | NOT_CONTENT_INDEXED | RENAME_OLD_NAME  
2015-03-25 15:13:49.356604 | Penguins.jpg | NOT_CONTENT_INDEXED | RENAME_OLD_NAME  
2015-03-25 15:13:49.465805 | Tulips.jpg | NOT_CONTENT_INDEXED | RENAME_OLD_NAME  
2015-03-24 20:11:42.836174 | Chrysanthemum.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Desert.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Hydrangeas.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Jellyfish.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Koala.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Lighthouse.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Penguins.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Tulips.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.836174 | Chrysanthemum.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Desert.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Hydrangeas.jpg | ARCHIVE | RENAME_OLD_NAME  
2015-03-24 20:11:42.851774 | Jellyfish.jpg | ARCHIVE | RENAME_OLD_NAME  
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YOU MUST SUBMIT A FULL-SCREEN IMAGE FOR FULL CREDIT!

Save the document with the filename "**YOUR NAME Lab 6.pdf**", replacing "YOUR NAME" with your real name.

Email the image to the instructor as an attachment to an e-mail message. Send it to: **xxx@fe.edu.vn** with a subject line of "**Lab 6 From YOUR NAME**", replacing "YOUR NAME" with your real name.

