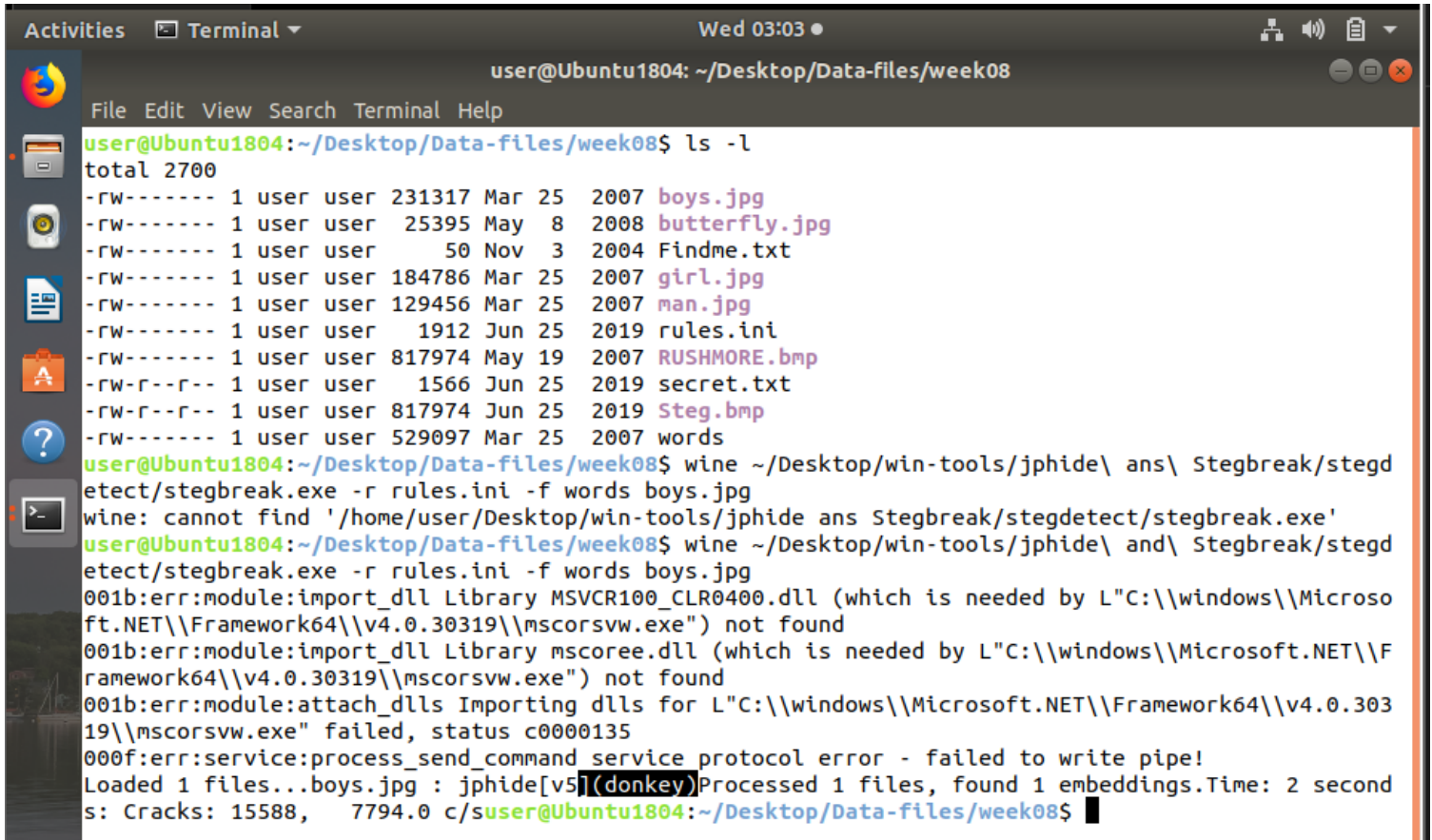
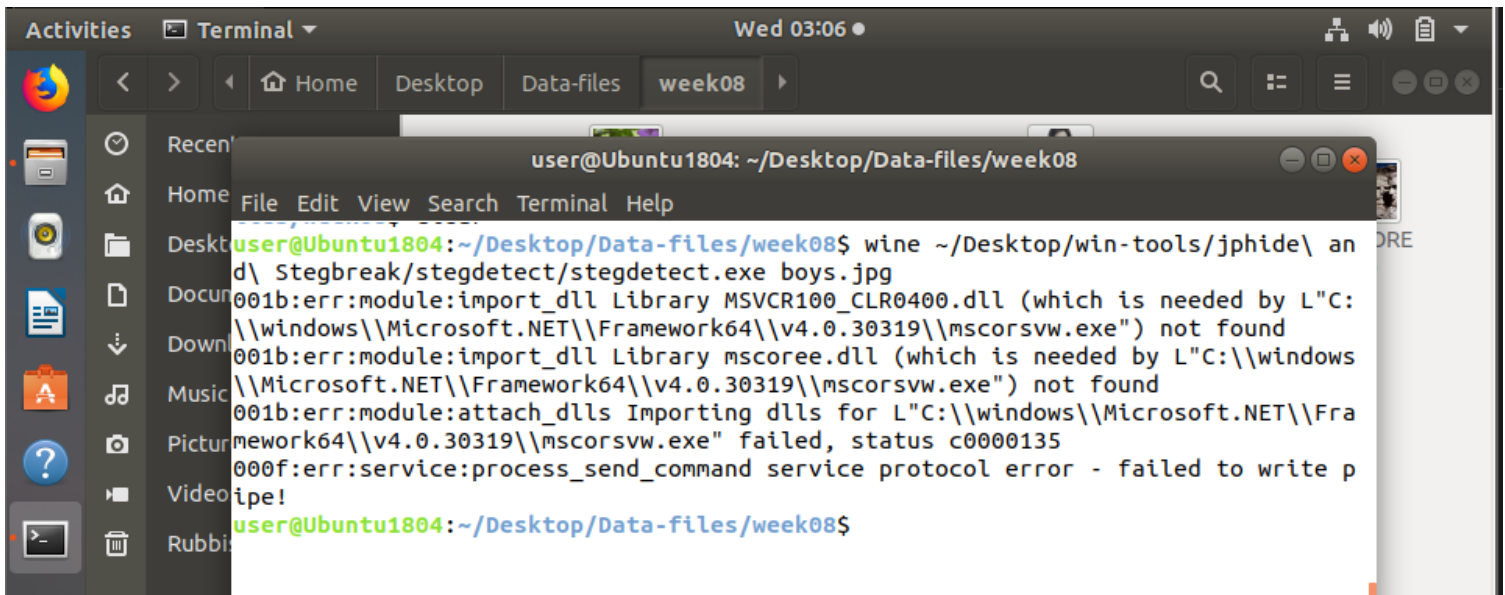


Introducing Stegbreak

Initially, I was presented with Stegbreak, an automatic instrument for identifying steganographic elements within JPEG pictures. I performed dictionary attacks on images using the wine emulator and Stegbreak to uncover passwords that were hidden. I looked at the vocabulary file this program utilizes after getting to know it.

A terminal window titled 'user@Ubuntu1804: ~/Desktop/Data-files/week08' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the execution of 'ls -l' listing files in the directory. Then, it runs 'wine ~/Desktop/win-tools/jphide\ ans\ Stegbreak/stegdetect/stegbreak.exe -r rules.ini -f words boys.jpg'. The output shows several error messages from the wine emulator regarding missing DLLs (MSVCR100, mscorlib, mscorlib) and a service protocol error. Finally, it reports 'Loaded 1 files...boys.jpg : jphide[v5](donkey)Processed 1 files, found 1 embeddings.Time: 2 second s: Cracks: 15588, 7794.0 c/suser@Ubuntu1804:~/Desktop/Data-files/week08\$'.

```
user@Ubuntu1804: ~/Desktop/Data-files/week08
File Edit View Search Terminal Help
user@Ubuntu1804:~/Desktop/Data-files/week08$ ls -l
total 2700
-rw-rw-r-- 1 user user 231317 Mar 25 2007 boys.jpg
-rw-rw-r-- 1 user user 25395 May 8 2008 butterfly.jpg
-rw-rw-r-- 1 user user 50 Nov 3 2004 Findme.txt
-rw-rw-r-- 1 user user 184786 Mar 25 2007 girl.jpg
-rw-rw-r-- 1 user user 129456 Mar 25 2007 man.jpg
-rw-rw-r-- 1 user user 1912 Jun 25 2019 rules.ini
-rw-rw-r-- 1 user user 817974 May 19 2007 RUSHMORE.bmp
-rw-rw-r-- 1 user user 1566 Jun 25 2019 secret.txt
-rw-rw-r-- 1 user user 817974 Jun 25 2019 Steg.bmp
-rw-rw-r-- 1 user user 529097 Mar 25 2007 words
user@Ubuntu1804:~/Desktop/Data-files/week08$ wine ~/Desktop/win-tools/jphide\ ans\ Stegbreak/stegdetect/stegbreak.exe -r rules.ini -f words boys.jpg
wine: cannot find '/home/user/Desktop/win-tools/jphide ans Stegbreak/stegdetect/stegbreak.exe'
user@Ubuntu1804:~/Desktop/Data-files/week08$ wine ~/Desktop/win-tools/jphide\ and\ Stegbreak/stegdetect/stegbreak.exe -r rules.ini -f words boys.jpg
001b:err:module:import_dll Library MSVCR100_CLR0400.dll (which is needed by L"C:\\windows\\Microsoft.NET\\Framework64\\v4.0.30319\\mscorlib.exe") not found
001b:err:module:import_dll Library mscorlib.dll (which is needed by L"C:\\windows\\Microsoft.NET\\Framework64\\v4.0.30319\\mscorlib.exe") not found
001b:err:module:attach_dlls Importing dlls for L"C:\\windows\\Microsoft.NET\\Framework64\\v4.0.30319\\mscorlib.exe" failed, status c0000135
000f:err:service:process_send_command service protocol error - failed to write pipe!
Loaded 1 files...boys.jpg : jphide[v5](donkey)Processed 1 files, found 1 embeddings.Time: 2 second
s: Cracks: 15588, 7794.0 c/suser@Ubuntu1804:~/Desktop/Data-files/week08$
```

A terminal window titled 'user@Ubuntu1804: ~/Desktop/Data-files/week08' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the execution of 'wine ~/Desktop/win-tools/jphide\ and\ Stegbreak/stegdetect/stegdetect.exe boys.jpg'. The output shows several error messages from the wine emulator regarding missing DLLs (MSVCR100, mscorlib, mscorlib) and a service protocol error. Finally, it reports 'Loaded 1 files...boys.jpg : jphide[v5](donkey)Processed 1 files, found 1 embeddings.Time: 2 second s: Cracks: 15588, 7794.0 c/suser@Ubuntu1804:~/Desktop/Data-files/week08\$'. A file manager window is overlaid on the terminal, showing the directory structure: Recent, Home, Desktop, Data-files, week08.

```
user@Ubuntu1804: ~/Desktop/Data-files/week08
File Edit View Search Terminal Help
user@Ubuntu1804:~/Desktop/Data-files/week08$ wine ~/Desktop/win-tools/jphide\ and\ Stegbreak/stegdetect/stegdetect.exe boys.jpg
001b:err:module:import_dll Library MSVCR100_CLR0400.dll (which is needed by L"C:\\windows\\Microsoft.NET\\Framework64\\v4.0.30319\\mscorlib.exe") not found
001b:err:module:import_dll Library mscorlib.dll (which is needed by L"C:\\windows\\Microsoft.NET\\Framework64\\v4.0.30319\\mscorlib.exe") not found
001b:err:module:attach_dlls Importing dlls for L"C:\\windows\\Microsoft.NET\\Framework64\\v4.0.30319\\mscorlib.exe" failed, status c0000135
000f:err:service:process_send_command service protocol error - failed to write pipe!
Loaded 1 files...boys.jpg : jphide[v5](donkey)Processed 1 files, found 1 embeddings.Time: 2 second
s: Cracks: 15588, 7794.0 c/suser@Ubuntu1804:~/Desktop/Data-files/week08$
```

Activities Terminal Wed 03:17

System program problem detected

user@Ubuntu1804: ~/Desktop/Data-files/week08

```
File Edit View Search Terminal Help
.0.30319\\mscorsvw.exe" failed, status c0000135
000f:err:service:process_send_command service protocol error - failed to write pipe!
user@Ubuntu1804:~/Desktop/Data-files/week08$ wine ~/Desktop/win-tools/jphide\ and\ Stegbreak
/stegdetect/stegbreak.exe -r rules.ini -f words butterfly.jpg
001b:err:module:import_dll Library MSVCR100_CLR0400.dll (which is needed by L"C:\\windows\\M
icrosoft.NET\\Framework64\\v4.0.30319\\mscorsvw.exe") not found
001b:err:module:import_dll Library mscoree.dll (which is needed by L"C:\\windows\\Microsoft.
NET\\Framework64\\v4.0.30319\\mscorsvw.exe") not found
001b:err:module:attach_dlls Importing dlls for L"C:\\windows\\Microsoft.NET\\Framework64\\v4
.0.30319\\mscorsvw.exe" failed, status c0000135
000f:err:service:process_send_command service protocol error - failed to write pipe!
Loaded 1 files...butterfly.jpg : negativeProcessed 1 files, found 0 embeddings.Time: 325 sec
onds: Cracks: 2315459, 7124.5 c/suser@Ubuntu1804:~/Desktop/Data-files/week08$ wine ~/Deskt
op/win-toolsetect/stegdetect.exe butterfly.jpg
001b:err:module:import_dll Library MSVCR100_CLR0400.dll (which is needed by L"C:\\windows\\M
icrosoft.NET\\Framework64\\v4.0.30319\\mscorsvw.exe") not found
001b:err:module:import_dll Library mscoree.dll (which is needed by L"C:\\windows\\Microsoft.
NET\\Framework64\\v4.0.30319\\mscorsvw.exe") not found
001b:err:module:attach_dlls Importing dlls for L"C:\\windows\\Microsoft.NET\\Framework64\\v4
.0.30319\\mscorsvw.exe" failed, status c0000135
000f:err:service:process_send_command service protocol error - failed to write pipe!
user@Ubuntu1804:~/Desktop/Data-files/week08$
```

Activities Terminal Wed 03:19

user@Ubuntu1804: ~/Desktop/Data-files/week08

```
File Edit View Search Terminal Help
user@Ubuntu1804:~/Desktop/Data-files/week08$ wine ~/Desktop/win-tools/jphide\ and\ Stegbreak
/stegdetect/stegbreak.exe -r rules.ini -f words girl.jpg
001b:err:module:import_dll Library MSVCR100_CLR0400.dll (which is needed by L"C:\\windows\\M
icrosoft.NET\\Framework64\\v4.0.30319\\mscorsvw.exe") not found
001b:err:module:import_dll Library mscoree.dll (which is needed by L"C:\\windows\\Microsoft.
NET\\Framework64\\v4.0.30319\\mscorsvw.exe") not found
001b:err:module:attach_dlls Importing dlls for L"C:\\windows\\Microsoft.NET\\Framework64\\v4
.0.30319\\mscorsvw.exe" failed, status c0000135
000f:err:service:process_send_command service protocol error - failed to write pipe!
Loaded 1 files...girl.jpg : jphide[v5](money)Processed 1 files, found 1 embeddings.Time: 4 s
econds: Cracks: 32430, 8107.5 c/suser@Ubuntwine ~/Desktop/win-tools/jphide\ and\ Stegbreak
/stegdetect/stegdetect.exe girl.jpg
001b:err:module:import_dll Library MSVCR100_CLR0400.dll (which is needed by L"C:\\windows\\M
icrosoft.NET\\Framework64\\v4.0.30319\\mscorsvw.exe") not found
001b:err:module:import_dll Library mscoree.dll (which is needed by L"C:\\windows\\Microsoft.
NET\\Framework64\\v4.0.30319\\mscorsvw.exe") not found
001b:err:module:attach_dlls Importing dlls for L"C:\\windows\\Microsoft.NET\\Framework64\\v4
.0.30319\\mscorsvw.exe" failed, status c0000135
000f:err:service:process_send_command service protocol error - failed to write pipe!
girl.jpg : negativeuser@Ubuntu1804:~/Desktop/Data-files/week08$
```

Activities Terminal Wed 03:20

user@Ubuntu1804: ~/Desktop/Data-files/week08

```
File Edit View Search Terminal Help
user@Ubuntu1804:~/Desktop/Data-files/week08$ wine ~/Desktop/win-tools/jphide\ and\ Stegbreak
/stegdetect/stegbreak.exe -r rules.ini -f words man.jpg
001b:err:module:import_dll Library MSVCR100_CLR0400.dll (which is needed by L"C:\\windows\\M
icrosoft.NET\\Framework64\\v4.0.30319\\mscorlib.exe") not found
001b:err:module:import_dll Library mscoree.dll (which is needed by L"C:\\windows\\Microsoft.
NET\\Framework64\\v4.0.30319\\mscorlib.exe") not found
001b:err:module:attach_dlls Importing dlls for L"C:\\windows\\Microsoft.NET\\Framework64\\v4
.0.30319\\mscorlib.exe" failed, status c0000135
000f:err:service:process_send_command service protocol error - failed to write pipe!
Loaded 1 files...man.jpg : jphide[v5](giraffe)Processed 1 files, found 1 embeddings.Time: 3
seconds: Cracks: 21886, 7295.3 c/suser@Ubuntu1804:~/Desktop/Data-files/week08$
user@Ubuntu1804:~/Desktop/Data-files/week08$ wine ~/Desktop/win-tools/jphide\ and\ Stegbreak
/stegdetect/stegdetect.exe man.jpg
001b:err:module:import_dll Library MSVCR100_CLR0400.dll (which is needed by L"C:\\windows\\M
icrosoft.NET\\Framework64\\v4.0.30319\\mscorlib.exe") not found
001b:err:module:import_dll Library mscoree.dll (which is needed by L"C:\\windows\\Microsoft.
NET\\Framework64\\v4.0.30319\\mscorlib.exe") not found
001b:err:module:attach_dlls Importing dlls for L"C:\\windows\\Microsoft.NET\\Framework64\\v4
.0.30319\\mscorlib.exe" failed, status c0000135
000f:err:service:process_send_command service protocol error - failed to write pipe!
man.jpg : negativeuser@Ubuntu1804:~/Desktop/Data-files/week08$
```



Open ▾



words

~/Desktop/Data-files/week08

Save



A

A's



Advent

Advent's

Advents



Africa

Africa's

African



Africans

Allah



Allah's

America

America's



American

Americana



Americana's

Americanism

Americanism's

Americanisms

Americans

Anglican

Anglicans

Anglo

Anglo's

Anglos

Antarctic

Antarctic's

Antarctica

Antarctica's

Apr

Apr's

April

April's

Aprils

Aquarius

Aquarius's

Aquariuses

Arab

Arab's

Arabic

Arabic's

Arabs

Arabs

Plain Text ▾

Tab Width: 8 ▾

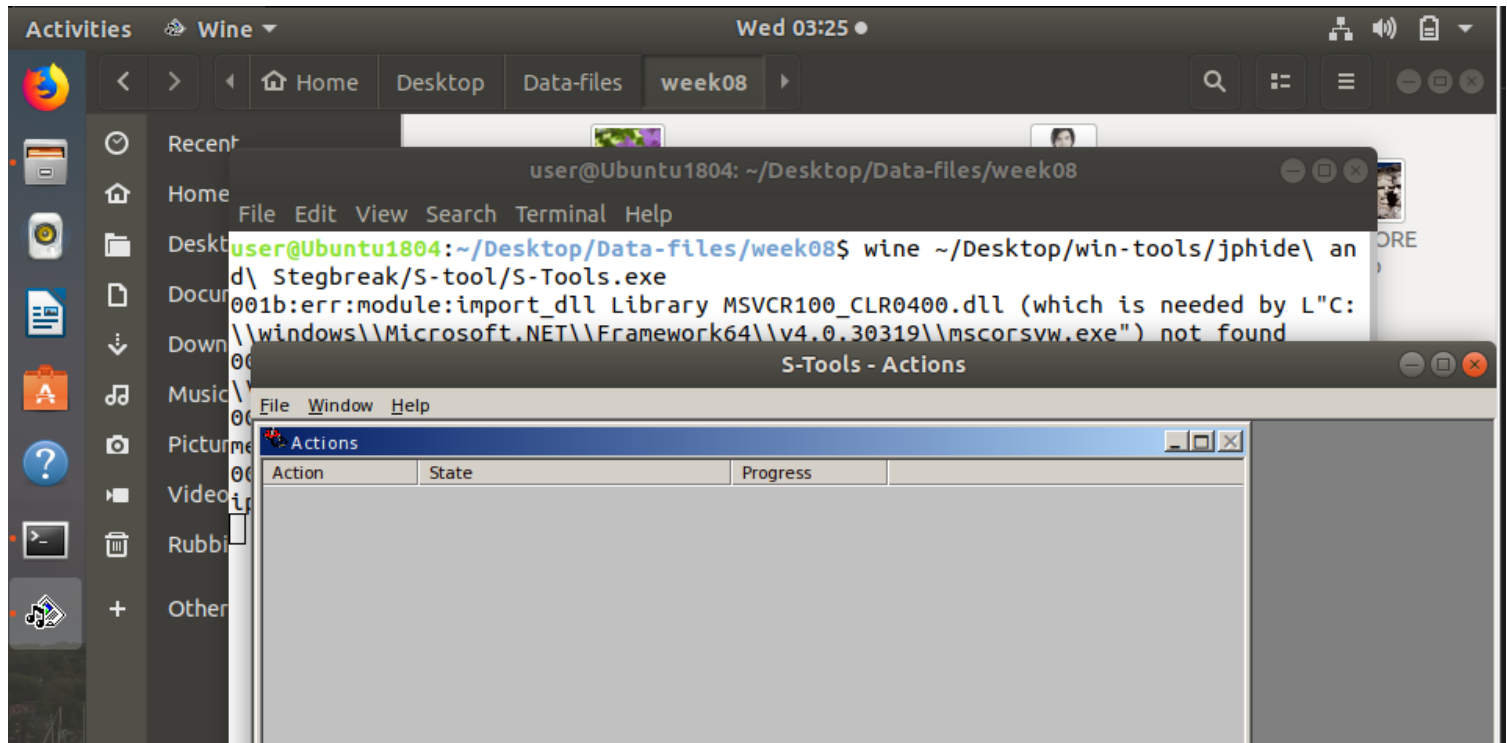
Ln 1, Col 1 ▾

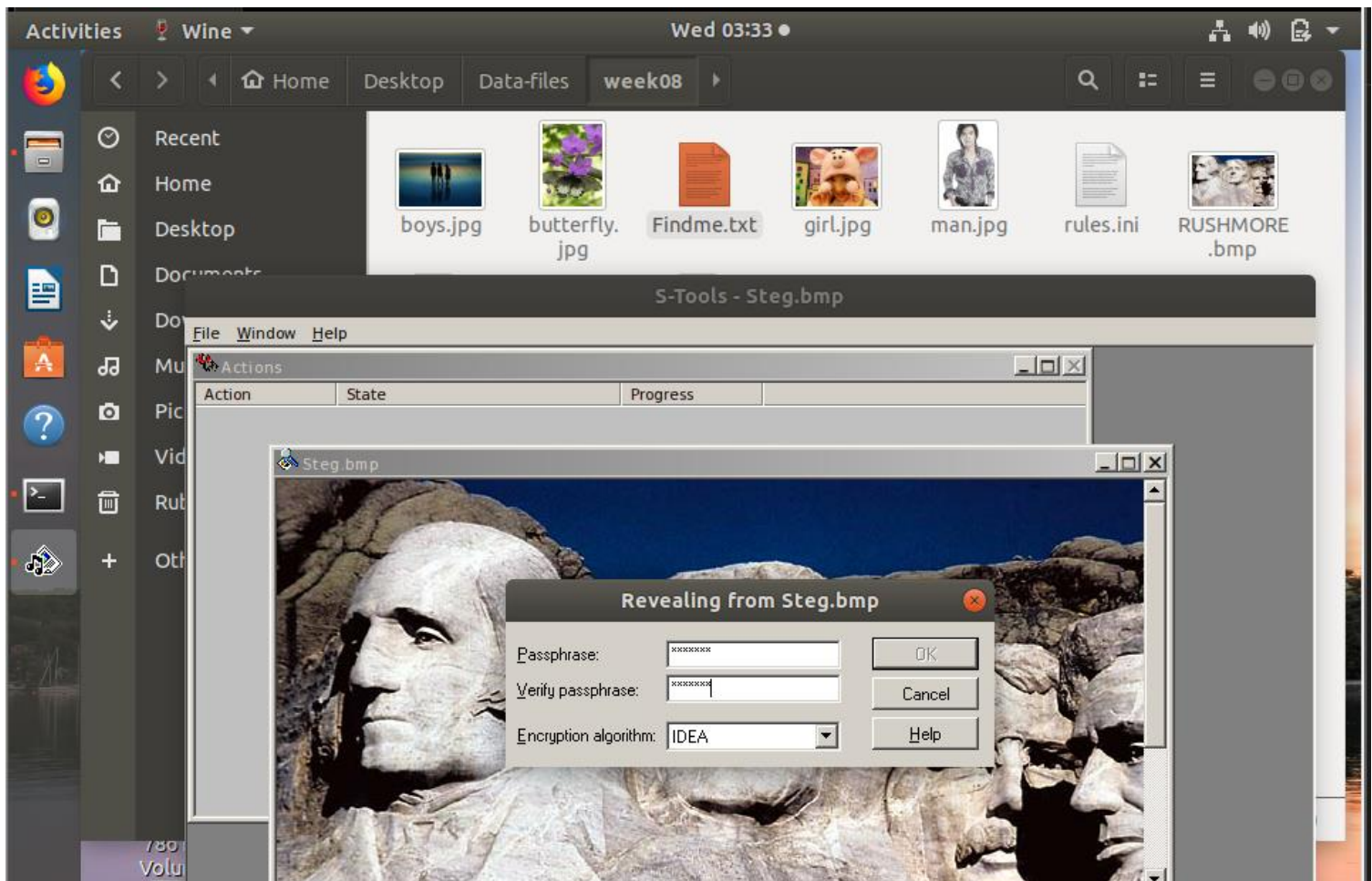
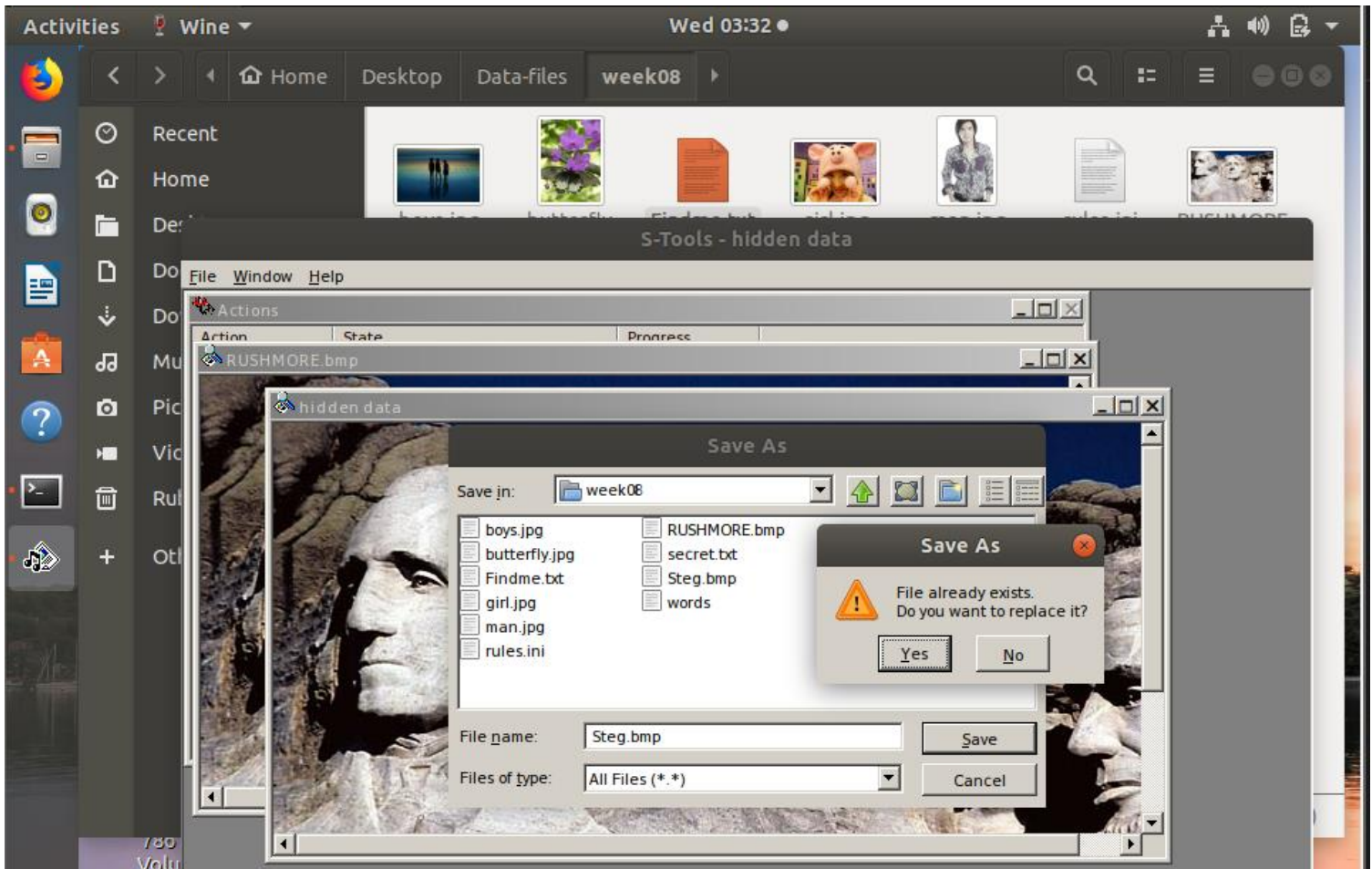
INS

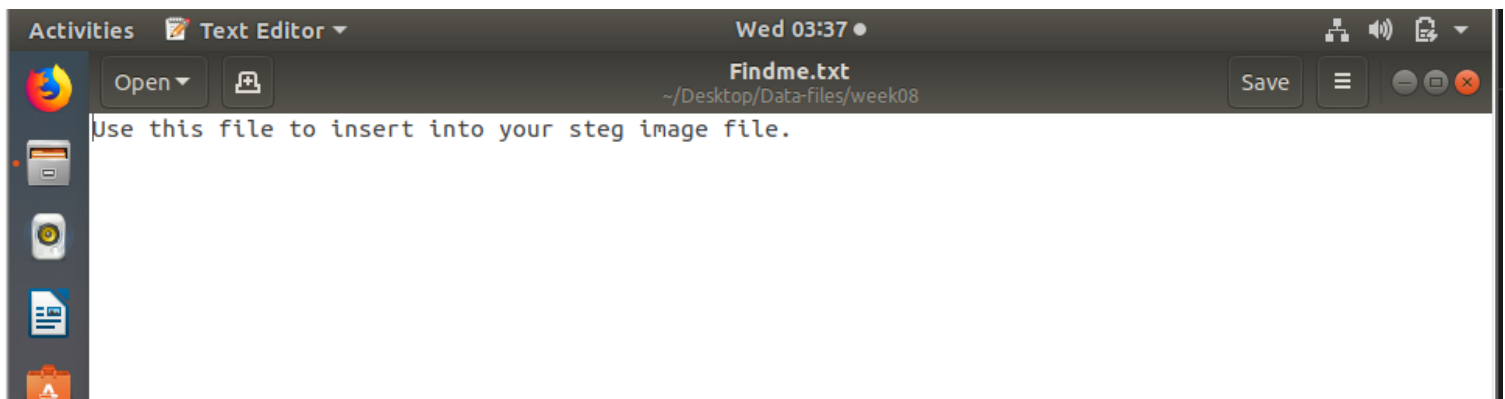
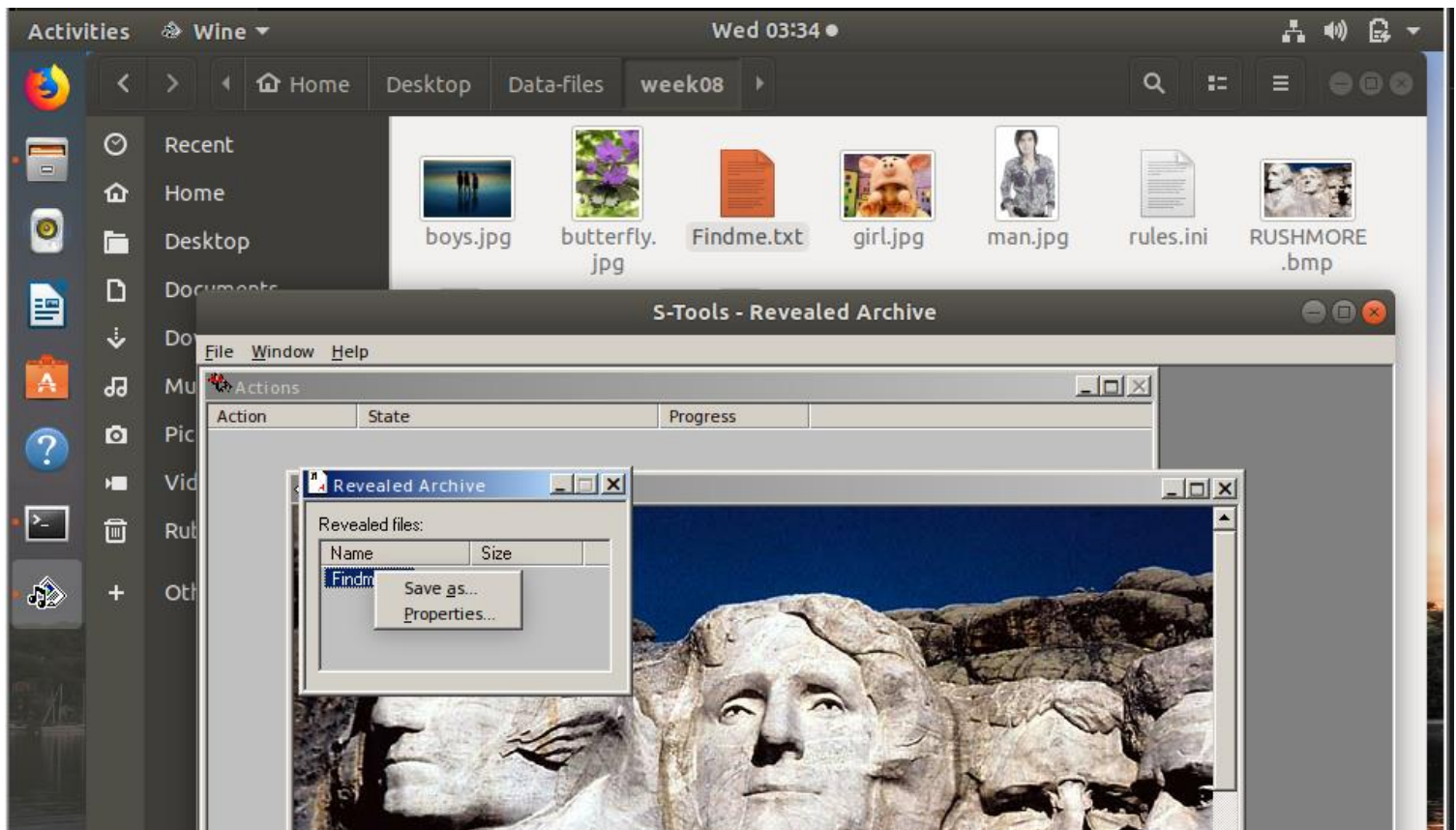
Introducing S-Tools

S-Tools, a GUI-based utility for embedding and exposing hidden content in image files, was the next program I looked at. I experimented with various encryption techniques to conceal and disclose text data inside of pictures.

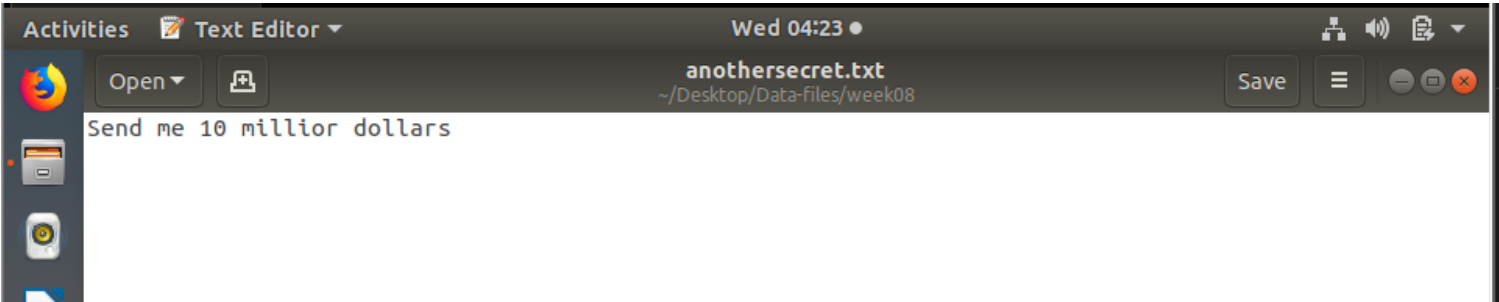
In this I used the rushmore.bmp file and hide the findme.txt with IDEA encryption and the passphrase was FREEDOM.



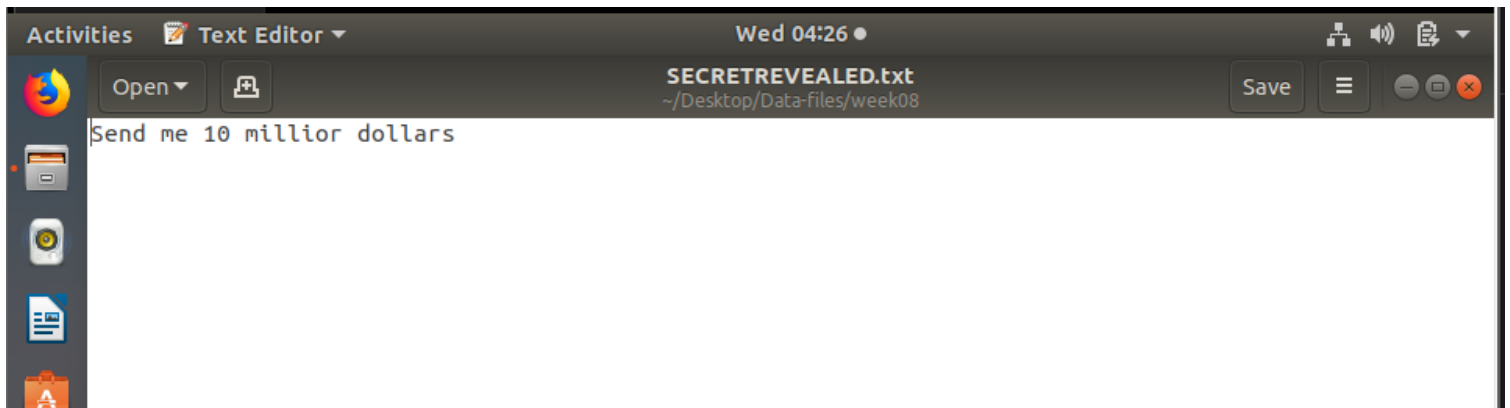
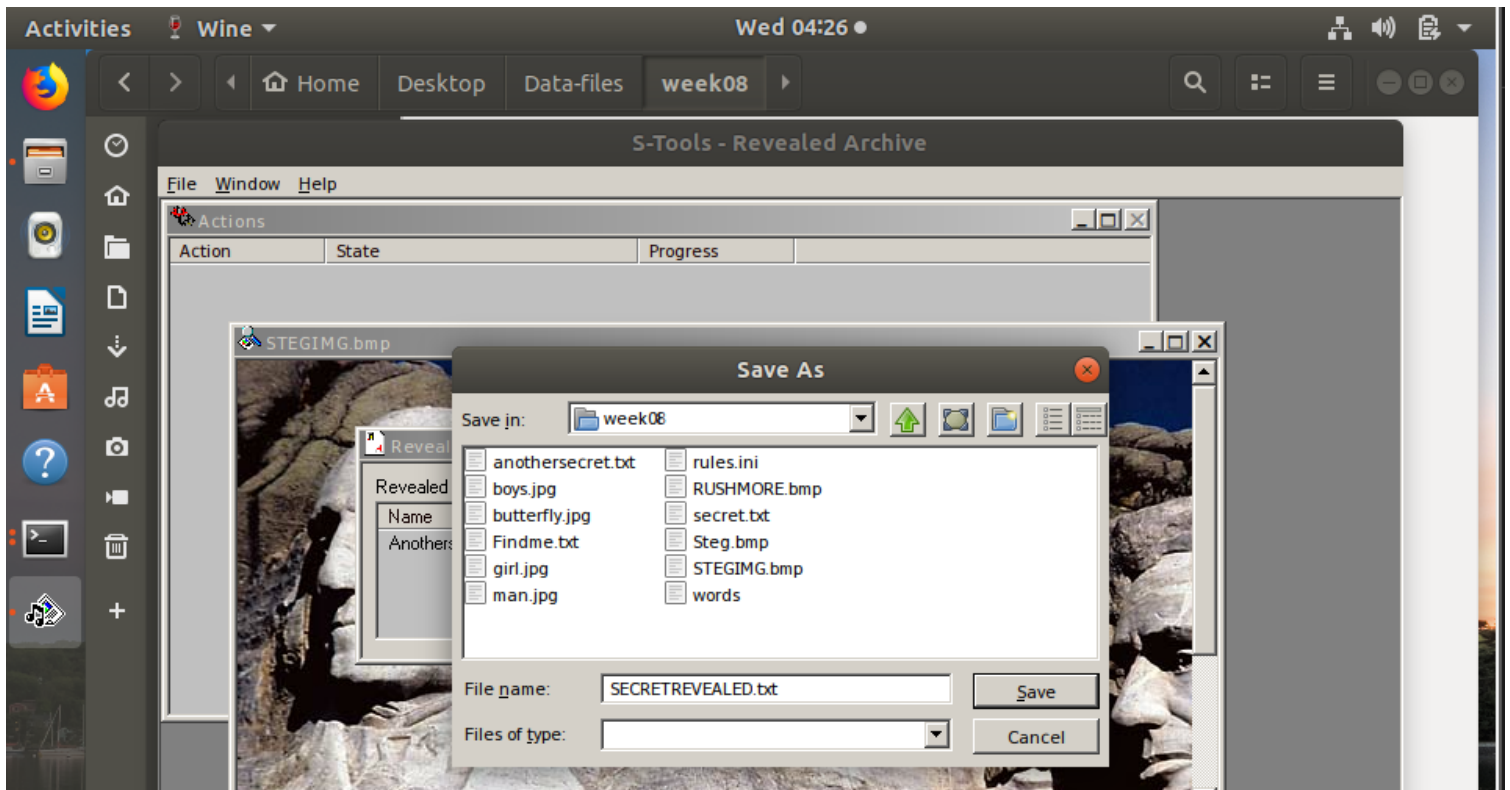




Then I created my own secret and hide it in the rushmore.bmp file. But this time I used the triple des encryption and a different password to hide it and then recovered it to see how it works.

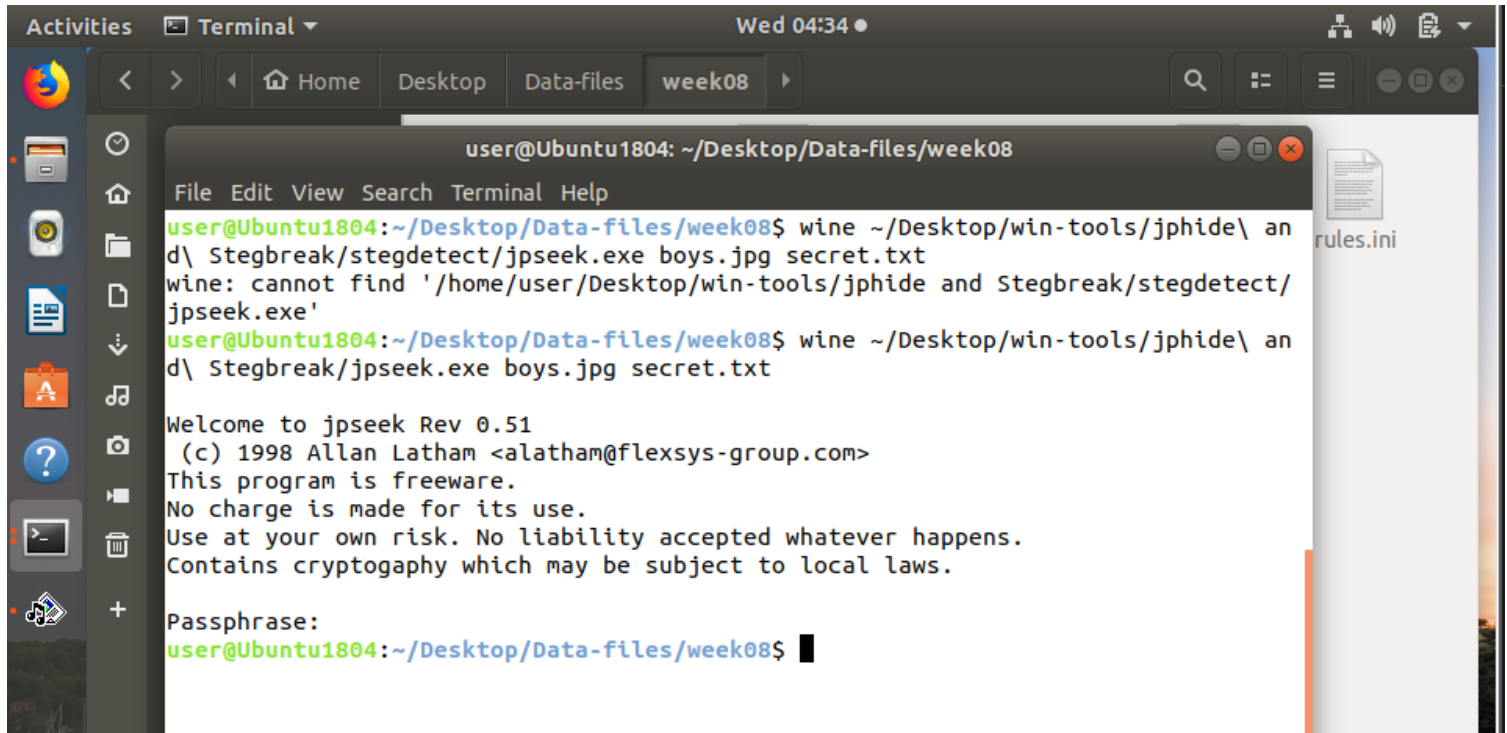






Using jpseek to Recover Steganography Images

Finally, I used previously acquired passwords to extract concealed contents from photos using jpseek, another Windows utility.

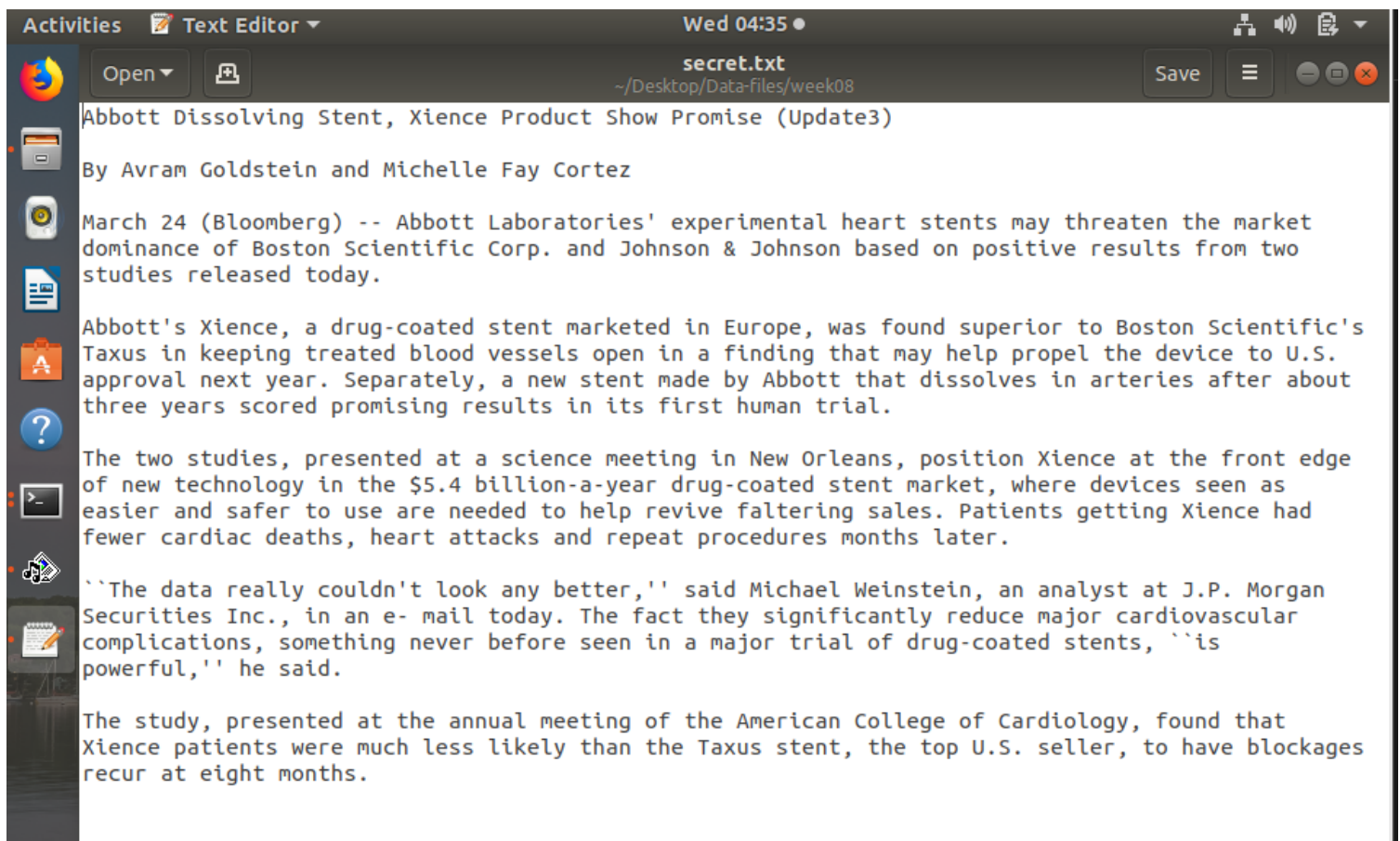


The image shows a terminal window in Ubuntu 18.04. The user is in the directory ~/Desktop/Data-files/week08. They attempt to run a command to execute jpseek.exe using wine, but it fails because the file path is incorrect. After correcting the path, the program runs successfully, displaying a welcome message and a passphrase prompt.

```
user@Ubuntu1804: ~/Desktop/Data-files/week08
File Edit View Search Terminal Help
user@Ubuntu1804:~/Desktop/Data-files/week08$ wine ~/Desktop/win-tools/jphide\ and
d\ Stegbreak/stegdetect/jpseek.exe boys.jpg secret.txt
wine: cannot find '/home/user/Desktop/win-tools/jphide and Stegbreak/stegdetect/
jpseek.exe'
user@Ubuntu1804:~/Desktop/Data-files/week08$ wine ~/Desktop/win-tools/jphide\ an
d\ Stegbreak/jpseek.exe boys.jpg secret.txt

Welcome to jpseek Rev 0.51
(c) 1998 Allan Latham <alatham@flexsys-group.com>
This program is freeware.
No charge is made for its use.
Use at your own risk. No liability accepted whatever happens.
Contains cryptography which may be subject to local laws.

Passphrase:
user@Ubuntu1804:~/Desktop/Data-files/week08$
```



The image shows a text editor window displaying the content of secret.txt. The text is a news article about Abbott Laboratories' experimental heart stents.

```
secret.txt
~/Desktop/Data-files/week08
Abbott Dissolving Stent, Xience Product Show Promise (Update3)

By Avram Goldstein and Michelle Fay Cortez

March 24 (Bloomberg) -- Abbott Laboratories' experimental heart stents may threaten the market
dominance of Boston Scientific Corp. and Johnson & Johnson based on positive results from two
studies released today.

Abbott's Xience, a drug-coated stent marketed in Europe, was found superior to Boston Scientific's
Taxus in keeping treated blood vessels open in a finding that may help propel the device to U.S.
approval next year. Separately, a new stent made by Abbott that dissolves in arteries after about
three years scored promising results in its first human trial.

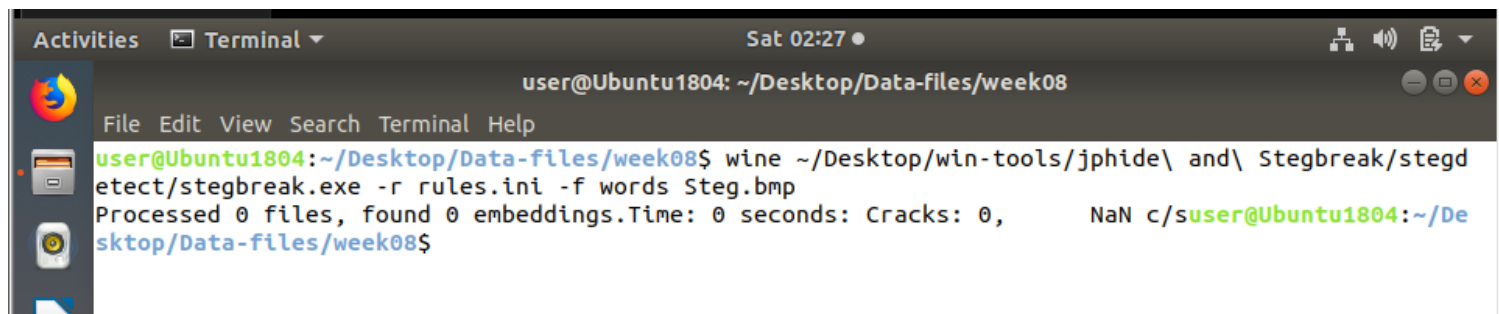
The two studies, presented at a science meeting in New Orleans, position Xience at the front edge
of new technology in the $5.4 billion-a-year drug-coated stent market, where devices seen as
easier and safer to use are needed to help revive faltering sales. Patients getting Xience had
fewer cardiac deaths, heart attacks and repeat procedures months later.

''The data really couldn't look any better,'' said Michael Weinstein, an analyst at J.P. Morgan
Securities Inc., in an e-mail today. The fact they significantly reduce major cardiovascular
complications, something never before seen in a major trial of drug-coated stents, ''is
powerful,'' he said.

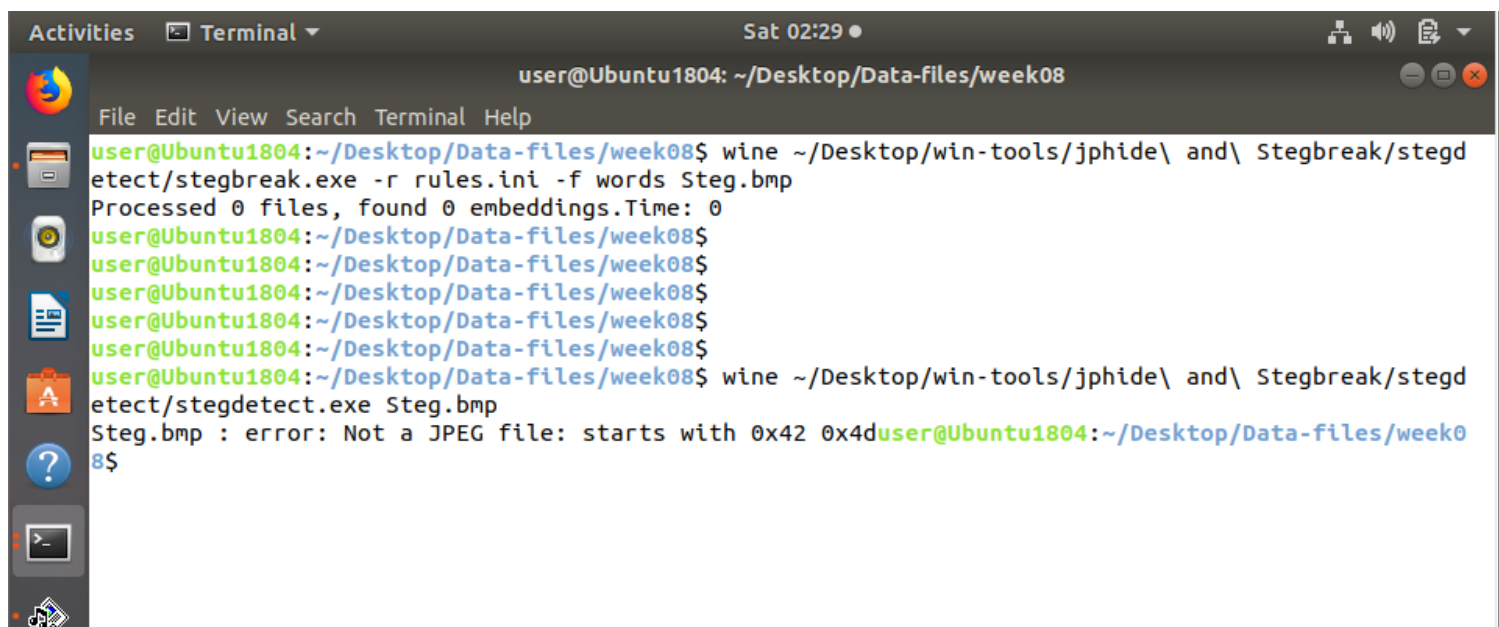
The study, presented at the annual meeting of the American College of Cardiology, found that
Xience patients were much less likely than the Taxus stent, the top U.S. seller, to have blockages
recur at eight months.
```


Forensic Tasks

My final task was to attempt to crack a picture I had processed using S-Tools using Stegbreak and to determine why it worked or didn't work.

A terminal window titled 'Terminal' with a dark background. The prompt is 'user@Ubuntu1804: ~/Desktop/Data-files/week08'. The command entered is 'wine ~/Desktop/win-tools/jphide\ and\ Stegbreak/stegdetect/stegbreak.exe -r rules.ini -f words Steg.bmp'. The output is 'Processed 0 files, found 0 embeddings.Time: 0 seconds: Cracks: 0, NaN c/suser@Ubuntu1804:~/Desktop/Data-files/week08\$'.

```
user@Ubuntu1804: ~/Desktop/Data-files/week08
user@Ubuntu1804:~/Desktop/Data-files/week08$ wine ~/Desktop/win-tools/jphide\ and\ Stegbreak/stegdetect/stegbreak.exe -r rules.ini -f words Steg.bmp
Processed 0 files, found 0 embeddings.Time: 0 seconds: Cracks: 0,      NaN c/suser@Ubuntu1804:~/Desktop/Data-files/week08$
```

A terminal window titled 'Terminal' with a dark background. The prompt is 'user@Ubuntu1804: ~/Desktop/Data-files/week08'. The command entered is 'wine ~/Desktop/win-tools/jphide\ and\ Stegbreak/stegdetect/stegdetect.exe Steg.bmp'. The output is 'Steg.bmp : error: Not a JPEG file: starts with 0x42 0x4duser@Ubuntu1804:~/Desktop/Data-files/week08\$'.

```
user@Ubuntu1804: ~/Desktop/Data-files/week08
user@Ubuntu1804:~/Desktop/Data-files/week08$ wine ~/Desktop/win-tools/jphide\ and\ Stegbreak/stegdetect/stegdetect.exe Steg.bmp
Steg.bmp : error: Not a JPEG file: starts with 0x42 0x4duser@Ubuntu1804:~/Desktop/Data-files/week08$
```

The reason I didn't work is because it wasn't a JPEG file. The file I used was a .bmp file, so this tool stegbreak might only be used with JPEG images. The tool identifies what type of file it is with the header information of the image.