

1. Usage – Encoding:

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ls
a.out beautiful.bmp common.h decode.c decode.h encode.c encode.h main.c secret.txt types.h
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -e beautiful.bmp secret.txt
-----
Operation Type = encode
-----
INFO: Opening required files
INFO: Opened beautiful.bmp
INFO: Opened secret.txt
INFO: Opened stego.bmp
INFO: Done
INFO: ## Encoding Procedure Started ##
INFO: Checking for secret.txt size
INFO: Done. Not Empty
INFO: Checking for beautiful.bmp capacity to handle secret.txt
INFO: Done. Found OK
INFO: Output File not mentioned. Creating stego.bmp as default
INFO: Copying Image Header
INFO: Done
INFO: Encoding Magic String Signature
INFO: Done
INFO: Encoding secret.txt File Extension
INFO: Done
INFO: Encoding secret.txt File Size
INFO: Done
INFO: Encoding secret.txt File Data
INFO: Done
INFO: Copying Left Over Data
INFO: Done
INFO: ## Encoding Done Successfully ##
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ls
a.out beautiful.bmp common.h decode.c decode.h encode.c encode.h main.c secret.txt stego.bmp types.h
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ |
```

```

ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ls
a.out beautiful.bmp common.h decode.c decode.h encode.c encode.h main.c secret.txt stego.bmp types.h
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -e beautiful.bmp secret.txt encoded.bmp
-----
Operation Type = encode
-----
INFO: Opening required files
INFO: Opened beautiful.bmp
INFO: Opened secret.txt
INFO: Opened encoded.bmp
INFO: Done
INFO: ## Encoding Procedure Started ##
INFO: Checking for secret.txt size
INFO: Done. Not Empty
INFO: Checking for beautiful.bmp capacity to handle secret.txt
INFO: Done. Found OK
INFO: Creating encoded.bmp as encoded output image file.
INFO: Copying Image Header
INFO: Done
INFO: Encoding Magic String Signature
INFO: Done
INFO: Encoding secret.txt File Extension
INFO: Done
INFO: Encoding secret.txt File Size
INFO: Done
INFO: Encoding secret.txt File Data
INFO: Done
INFO: Copying Left Over Data
INFO: Done
INFO: ## Encoding Done Successfully ##
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ls
a.out beautiful.bmp common.h decode.c decode.h encode.c encode.h encoded.bmp main.c secret.txt stego.bmp types.h
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ |

```



beautiful.bmp file
(Original File)



encoded.bmp file
(Encoded File)

2. Usage – Decoding:

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ls
a.out beautiful.bmp common.h decode.c decode.h encode.c encode.h encoded.bmp main.c secret.txt types.h
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -d encoded.bmp

-----
Operation Type = decode
-----
INFO: ## Decoding Procedure Started ##
INFO: Opening required image file
INFO: Opened encoded.bmp
INFO: Decoding Magic String Signature
INFO: Done
INFO: Decoding Output File Extension
INFO: Done
INFO: Output File not mentioned. Creating decoded_secret.txt as default
INFO: Opened decoded_secret.txt
INFO: Done. Opened all required files
INFO: Decoding File Size
INFO: Done
INFO: Decoding File Data
INFO: Done
INFO: ## Decoding Done Successfully ##
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ls
a.out beautiful.bmp common.h decode.c decode.h decoded_secret.txt encode.c encode.h encoded.bmp main.c secret.txt types.h
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ |
```

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ls
a.out beautiful.bmp common.h decode.c decode.h decoded_secret.txt encode.c encode.h encoded.bmp main.c secret.txt types.h
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -d encoded.bmp decoded

-----
Operation Type = decode
-----
INFO: ## Decoding Procedure Started ##
INFO: Opening required image file
INFO: Opened encoded.bmp
INFO: Decoding Magic String Signature
INFO: Done
INFO: Decoding Output File Extension
INFO: Done
INFO: Creating decoded.txt as decoded output file.
INFO: Opened decoded.txt
INFO: Done. Opened all required files
INFO: Decoding File Size
INFO: Done
INFO: Decoding File Data
INFO: Done
INFO: ## Decoding Done Successfully ##
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ls
a.out beautiful.bmp common.h decode.c decode.h decoded.txt decoded_secret.txt encode.c encode.h encoded.bmp main.c secret.txt types.h
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ |
```


After Encoding & Decoding:

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ls
a.out beautiful.bmp common.h decode.c decode.h decoded.txt encode.c encode.h encoded.bmp main.c secret.txt types.h
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ hd beautiful.bmp | head
00000000  42 4d 36 00 24 00 00 00 00 00 36 00 00 00 28 00 |BM6.$.....6...(.
00000010  00 00 00 04 00 00 00 03 00 00 01 00 18 00 00 00 |.....
00000020  00 00 00 00 24 00 c4 0e 00 00 c4 0e 00 00 00 00 |....$.
00000030  00 00 00 00 00 00 01 01 01 03 03 03 03 05 05 03 |.....
00000040  05 05 02 04 04 01 03 03 01 06 05 03 08 07 03 0a |.....
00000050  07 00 06 03 00 06 03 00 09 06 02 0b 08 06 0f 0c |.....
00000060  04 10 0a 00 09 03 00 04 03 00 03 02 00 04 03 00 |.....
00000070  08 06 00 0a 07 00 0c 08 00 10 09 02 12 0b 0c 1e |.....
00000080  17 03 15 0e 01 11 0a 03 13 0c 05 13 0f 01 0f 0b |.....
00000090  01 0c 09 03 11 0b 03 11 0b 04 15 0c 05 14 0c 02 |.....
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ hd encoded.bmp | head
00000000  42 4d 36 00 24 00 00 00 00 00 36 00 00 00 28 00 |BM6.$.....6...(.
00000010  00 00 00 04 00 00 00 03 00 00 01 00 18 00 00 00 |.....
00000020  00 00 00 00 24 00 c4 0e 00 00 c4 0e 00 00 00 00 |....$.
00000030  00 00 00 00 00 00 00 00 01 02 02 02 03 05 04 02 |.....
00000040  05 04 03 04 05 00 02 02 00 06 04 02 08 06 02 0a |.....
00000050  06 00 06 02 00 06 02 00 08 06 02 0a 08 06 0e 0c |.....
00000060  04 10 0a 01 08 02 00 04 03 00 03 03 01 04 02 01 |.....
00000070  09 07 00 0b 06 00 0c 09 01 11 09 02 12 0a 0c 1f |.....
00000080  17 03 14 0f 00 10 0a 02 12 0c 04 12 0e 00 0e 0a |.....
00000090  00 0c 08 02 10 0a 02 10 0a 04 14 0c 04 14 0c 02 |.....
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ls -l beautiful.bmp encoded.bmp secret.txt decoded.txt
-rw-r--r-- 1 ashithadmin ashithadmin 2359351 Aug  7  2018 beautiful.bmp
-rw-r--r-- 1 ashithadmin ashithadmin      25 Nov 30 16:08 decoded.txt
-rw-r--r-- 1 ashithadmin ashithadmin 2359351 Nov 30 16:05 encoded.bmp
-rw-r--r-- 1 ashithadmin ashithadmin      25 Nov 16 16:08 secret.txt
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ cat secret.txt
My password is SECRET ;)
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ cat decoded.txt
My password is SECRET ;)
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ |
```

3. Error Handling:

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out
```

```
ERROR: ./a.out : INVALID ARGUMENTS
```

```
USAGE:
```

```
Encoding : ./a.out -e <.bmp_file> <.c/.sh/.txt_file> [.bmp_output_file(optional)]
```

```
Decoding : ./a.out -d <.bmp_file> [decoded_output_file_name_without_extention(optional)]
```

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -e
```

```
ERROR: ./a.out -e : INVALID ARGUMENTS
```

```
USAGE:
```

```
Encoding : ./a.out -e <.bmp_file> <.c/.sh/.txt_file> [.bmp_output_file(optional)]
```

```
Decoding : ./a.out -d <.bmp_file> [decoded_output_file_name_without_extention(optional)]
```

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -t beautiful.bmp
```

```
-----  
Operation Type = unsupported  
-----
```

```
ERROR: ./a.out -t beautiful.bmp : INVALID ARGUMENTS
```

```
USAGE:
```

```
Encoding : ./a.out -e <.bmp_file> <.c/.sh/.txt_file> [.bmp_output_file(optional)]
```

```
Decoding : ./a.out -d <.bmp_file> [decoded_output_file_name_without_extention(optional)]
```

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -e beautiful.bmp
```

```
-----  
Operation Type = encode  
-----
```

```
ERROR: ./a.out -e beautiful.bmp : INVALID ARGUMENTS
```

```
USAGE:
```

```
Encoding : ./a.out -e <.bmp_file> <.c/.sh/.txt_file> [.bmp_output_file(optional)]
```

```
Decoding : ./a.out -d <.bmp_file> [decoded_output_file_name_without_extention(optional)]
```

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -e beautiful.bmp secret
-----
Operation Type = encode
-----
ERROR: Secret message file should be .txt/.sh/.c file only.

ERROR: ./a.out -e beautiful.bmp secret : INVALID ARGUMENTS
USAGE:
Encoding : ./a.out -e <.bmp_file> <.c/.sh/.txt_file> [.bmp_output_file(optional)]
Decoding : ./a.out -d <.bmp_file> [decoded_output_file_name_without_extention(optional)]
```

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -e image.bmp secret.txt
-----
Operation Type = encode
-----
INFO: Opening required files
fopen: No such file or directory
ERROR: Unable to open file image.bmp
```

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ vi image.bmp
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -e image.bmp secret.txt
-----
Operation Type = encode
-----
INFO: Opening required files
INFO: Opened image.bmp
INFO: Opened secret.txt
INFO: Opened stego.bmp
INFO: Done
INFO: ## Encoding Procedure Started ##
INFO: Checking for secret.txt size
INFO: Done. Not Empty
INFO: Checking for image.bmp capacity to handle secret.txt
ERROR: "image.bmp" doesn't have the capacity to encode "secret.txt"
```

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -e beautiful.bmp secret.txt hello
-----
Operation Type = encode
-----
ERROR: Destination file hello is not a .bmp file.

ERROR: ./a.out -e beautiful.bmp secret.txt hello : INVALID ARGUMENTS
USAGE:
Encoding : ./a.out -e <.bmp_file> <.c/.sh/.txt_file> [.bmp_output_file(optional)]
Decoding : ./a.out -d <.bmp_file> [decoded_output_file_name_without_extention(optional)]
```



```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -e beautiful.bmp secret.txt hello.bmp dest
```

```
ERROR: ./a.out -e beautiful.bmp secret.txt hello.bmp dest : INVALID ARGUMENTS
```

```
USAGE:
```

```
Encoding : ./a.out -e <.bmp_file> <.c/.sh/.txt_file> [.bmp_output_file(optional)]
```

```
Decoding : ./a.out -d <.bmp_file> [decoded_output_file_name_without_extention(optional)]
```

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -t beautiful.bmp secret.txt hello.bmp
```

```
-----  
Operation Type = unsupported  
-----
```

```
ERROR: ./a.out -t beautiful.bmp secret.txt hello.bmp : INVALID ARGUMENTS
```

```
USAGE:
```

```
Encoding : ./a.out -e <.bmp_file> <.c/.sh/.txt_file> [.bmp_output_file(optional)]
```

```
Decoding : ./a.out -d <.bmp_file> [decoded_output_file_name_without_extention(optional)]
```

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -d decode
```

```
-----  
Operation Type = decode  
-----
```

```
ERROR: Entered decode is not .bmp file.
```

```
ERROR: ./a.out -d decode : INVALID ARGUMENTS
```

```
USAGE:
```

```
Encoding : ./a.out -e <.bmp_file> <.c/.sh/.txt_file> [.bmp_output_file(optional)]
```

```
Decoding : ./a.out -d <.bmp_file> [decoded_output_file_name_without_extention(optional)]
```

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -d decode.bmp
```

```
-----  
Operation Type = decode  
-----
```

```
INFO: ## Decoding Procedure Started ##
```

```
INFO: Opening required image file
```

```
fopen: No such file or directory
```

```
ERROR: Unable to open file decode.bmp
```

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ vi decode.bmp
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -d decode.bmp
```

```
-----
Operation Type = decode
-----
```

```
INFO: ## Decoding Procedure Started ##
INFO: Opening required image file
INFO: Opened decode.bmp
INFO: Decoding Magic String Signature
ERROR: Unable to read decode.bmp file to decode magic string.
```

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -d beautiful.bmp hello.txt
```

```
-----
Operation Type = decode
-----
```

```
ERROR: Entered hello.txt should not contain extention. Since extension is encoded in image file.
```

```
ERROR: ./a.out -d beautiful.bmp hello.txt : INVALID ARGUMENTS
```

```
USAGE:
```

```
Encoding : ./a.out -e <.bmp_file> <.c/.sh/.txt_file> [.bmp_output_file(optional)]
```

```
Decoding : ./a.out -d <.bmp_file> [decoded_output_file_name_without_extention(optional)]
```

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -d beautiful.bmp hello
```

```
-----
Operation Type = decode
-----
```

```
INFO: ## Decoding Procedure Started ##
INFO: Opening required image file
INFO: Opened beautiful.bmp
INFO: Decoding Magic String Signature
ERROR: Decoded magic string doesn't match original magic string(#*).
```

```
ashithadmin@LAPTOP-OAE19R6D:~/Projects/Steganography$ ./a.out -d beautiful.bmp hello dest
```

```
-----
Operation Type = decode
-----
```

```
ERROR: ./a.out -d beautiful.bmp hello dest : INVALID ARGUMENTS
```

```
USAGE:
```

```
Encoding : ./a.out -e <.bmp_file> <.c/.sh/.txt_file> [.bmp_output_file(optional)]
```

```
Decoding : ./a.out -d <.bmp_file> [decoded_output_file_name_without_extention(optional)]
```