

# Distributed Systems Assignment 2

Faazil Shaikh 100707829

Github Link: <https://github.com/FaazilShaikh/Distributed-Assignment-2>

## Introduction

This assignment is to create a distributed object-based application with five unique remote methods (services) of my choice, I will be using Java RMI to accomplish this.

## Application Ideas and Features

For this assignment I decided to create methods to allow for image uploading and downloading which is useful for users to either share images or store images on a server which means they would have a backup for the files sent. Users will be able to retrieve them at any time by downloading them. Since it is an image server no other files are allowed. Next, I created a method to sort numbers from smallest to largest and words in alphabetical order. Finally, I created encrypt and decrypt methods for any sort of string. This can be useful for encrypting a string to allow for more security.

## Challenges and Solutions

I did not face any challenges for this assignment. I was able to use the knowledge learned during the lectures, and the source code created during the labs to aid me in this assignment.

## Commands

- **upload (name)**
- **download (name)**
- **sort (values)**
- **encrypt (text)**
- **decrypt (text)**
- **triarea (height) (base)**

**Note: triarea is an extra command in case upload/download and encrypt/decrypt only count as one**

**upload** command allows to you upload an image from specified path/name of the file if it is in the current directory

**download** command allows you to download an image from the server with given name

**sort** command allows you to sort given values from smallest to largest or in alphabetical order if given a string

**encrypt** command allows you to encrypt a string

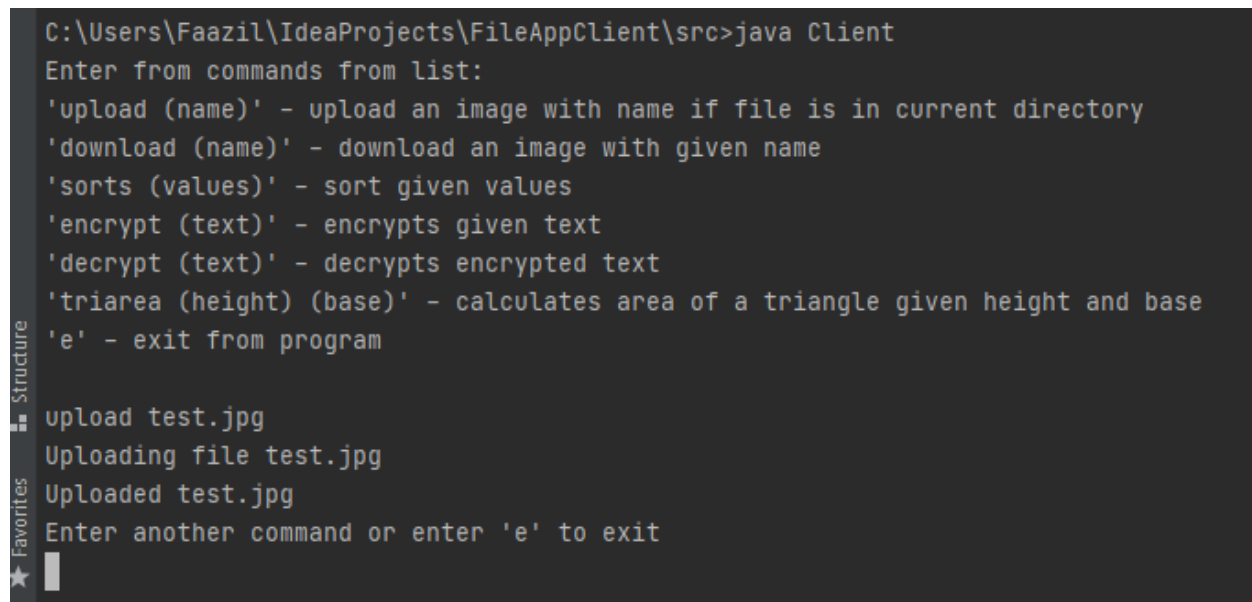
**decrypt** command allows you to decrypt an encrypted string

**triarea** command allows you to compute the area of a triangle given height and base

## Screenshot Demonstrations/Runs/Tests

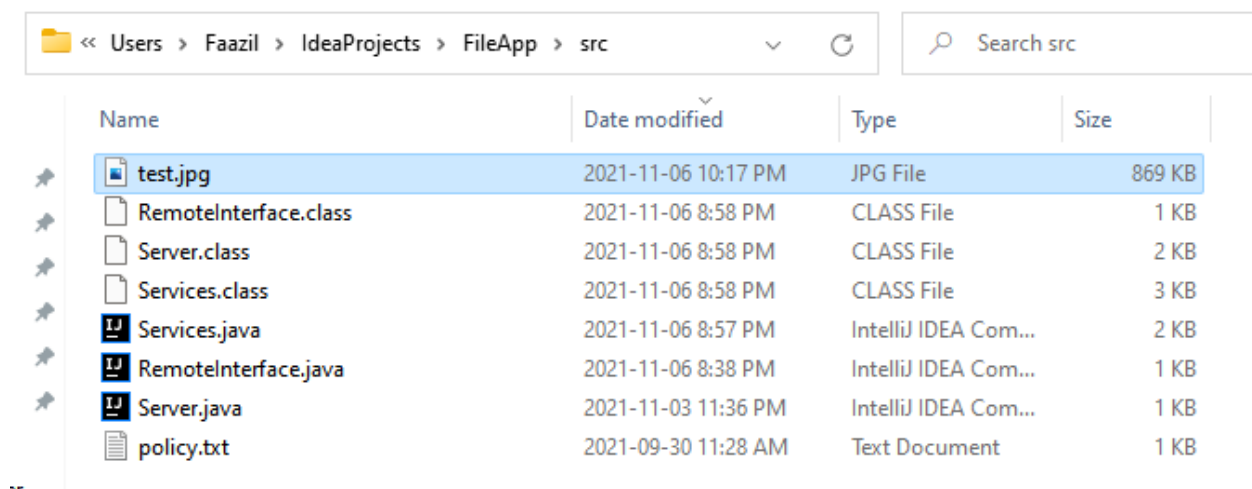
### “upload” command

Valid command sent



```
C:\Users\Faazil\IdeaProjects\FileAppClient\src>java Client
Enter from commands from list:
'upload (name)' - upload an image with name if file is in current directory
'download (name)' - download an image with given name
'sorts (values)' - sort given values
'encrypt (text)' - encrypts given text
'decrypt (text)' - decrypts encrypted text
'triarea (height) (base)' - calculates area of a triangle given height and base
'e' - exit from program

upload test.jpg
Uploading file test.jpg
Uploaded test.jpg
Enter another command or enter 'e' to exit
```



« Users > Faazil > IdeaProjects > FileApp > src					Search src	
	Name	Date modified	Type	Size		
	test.jpg	2021-11-06 10:17 PM	JPG File	869 KB		
	RemoteInterface.class	2021-11-06 8:58 PM	CLASS File	1 KB		
	Server.class	2021-11-06 8:58 PM	CLASS File	2 KB		
	Services.class	2021-11-06 8:58 PM	CLASS File	3 KB		
	Services.java	2021-11-06 8:57 PM	IntelliJ IDEA Com...	2 KB		
	RemoteInterface.java	2021-11-06 8:38 PM	IntelliJ IDEA Com...	1 KB		
	Server.java	2021-11-03 11:36 PM	IntelliJ IDEA Com...	1 KB		
	policy.txt	2021-09-30 11:28 AM	Text Document	1 KB		

Here a valid file name is inputted, there are no problems and the file was uploaded to the server.

## Invalid commands

```
C:\Users\Faazil\IdeaProjects\FileAppClient\src>java Client
Enter from commands from list:
'upload (name)' - upload an image with name if file is in current directory
'download (name)' - download an image with given name
'sorts (values)' - sort given values
'encrypt (text)' - encrypts given text
'decrypt (text)' - decrypts encrypted text
'triarea (height) (base)' - calculates area of a triangle given height and base
'e' - exit from program

upload unknownfile.jpg
Uploading file unknownfile.jpg
File not found!
Enter another command or enter 'e' to exit
```

Here the user tries uploading a file that does not exist, the user is told that the file was not found and is able to enter another command.

```
C:\Users\Faazil\IdeaProjects\FileAppClient\src>java Client
Enter from commands from list:
'upload (name)' - upload an image with name if file is in current directory
'download (name)' - download an image with given name
'sorts (values)' - sort given values
'encrypt (text)' - encrypts given text
'decrypt (text)' - decrypts encrypted text
'triarea (height) (base)' - calculates area of a triangle given height and base
'e' - exit from program

upload file.txt
Only png and jpg extensions are allowed. txt
Enter another command or enter 'e' to exit
```

Here the user tries uploading a file that is not an image, since this is an image server the only files that are allowed are png and jpg!

```

C:\Users\Faazil\IdeaProjects\FileAppClient\src>java Client
Enter from commands from list:
'upload (name)' - upload an image with name if file is in current directory
'download (name)' - download an image with given name
'sort (values)' - sorts given values
'encrypt (text)' - encrypts given text
'decrypt (text)' - decrypts encrypted text
'triarea (height) (base)' - calculates area of a triangle given height and base
'e' - exit from program

upload
Enter a file name!
Enter another command or enter 'e' to exit

```

Here the user doesn't enter a file name, they are told to enter a filename.

### **"download" command**

#### **Valid command sent**

```

Enter from commands from list:
'upload (name)' - upload an image with name if file is in current directory
'download (name)' - download an image with given name
'sorts (values)' - sort given values
'encrypt (text)' - encrypts given text
'decrypt (text)' - decrypts encrypted text
'triarea (height) (base)' - calculates area of a triangle given height and base
'e' - exit from program

download test.jpg
Downloaded test.jpg
Enter another command or enter 'e' to exit

```

<< Users > Faazil > IdeaProjects > FileAppClient > src <span>Search src</span>				
Name	Date modified	Type	Size	
Client.class	2021-11-06 10:25 PM	CLASS File	6 KB	
Client.java	2021-11-06 10:24 PM	IntelliJ IDEA Com...	7 KB	
policy.txt	2021-09-30 8:04 PM	Text Document	1 KB	
RemoteInterface.class	2021-11-06 10:25 PM	CLASS File	1 KB	
RemoteInterface.java	2021-11-06 8:34 PM	IntelliJ IDEA Com...	1 KB	
test.jpg	2021-11-06 10:25 PM	JPG File	869 KB	

Here a user inputs a valid image file to download from the server, file is downloaded.

## Invalid commands

```
Enter from commands from list:
'upload (name)' - upload an image with name if file is in current directory
'download (name)' - download an image with given name
'sorts (values)' - sort given values
'encrypt (text)' - encrypts given text
'decrypt (text)' - decrypts encrypted text
'triarea (height) (base)' - calculates area of a triangle given height and base
'e' - exit from program

download unknownfile.jpg
File not found!
Enter another command or enter 'e' to exit
```

Here the user inputs an invalid file, user is told the file is not found and is able to enter another command

```
C:\Users\Faazil\IdeaProjects\FileAppClient\src>java Client
Enter from commands from list:
'upload (name)' - upload an image with name if file is in current directory
'download (name)' - download an image with given name
'sort (values)' - sorts given values
'encrypt (text)' - encrypts given text
'decrypt (text)' - decrypts encrypted text
'triarea (height) (base)' - calculates area of a triangle given height and base
'e' - exit from program

download
Enter a file name!
Enter another command or enter 'e' to exit
```

User does not enter a file name at all, they are told to enter a file name

## “sort” command

### Valid commands sent

```

C:\Users\Faazil\IdeaProjects\FileAppClient\src>java Client
Enter from commands from list:
'upload (name)' - upload an image with name if file is in current directory
'download (name)' - download an image with given name
'sorts (values)' - sort given values
'encrypt (text)' - encrypts given text
'decrypt (text)' - decrypts encrypted text
'triarea (height) (base)' - calculates area of a triangle given height and base
'e' - exit from program

sort hi hello abc
Sorted Array:
abc hello hi
Enter another command or enter 'e' to exit
sort 1 5 3 7.3 2.2
Sorted Array:
1 2.2 3 5 7.3
Enter another command or enter 'e' to exit

```

Here the user has entered a valid command with valid string inputs, the data is sorted in alphabetical order. The user then inputs number values and the data is sorted from smallest to greatest.

#### Invalid command

```

C:\Users\Faazil\IdeaProjects\FileAppClient\src>java Client
Enter from commands from list:
'upload (name)' - upload an image with name if file is in current directory
'download (name)' - download an image with given name
'sort (values)' - sorts given values
'encrypt (text)' - encrypts given text
'decrypt (text)' - decrypts encrypted text
'triarea (height) (base)' - calculates area of a triangle given height and base
'e' - exit from program

sort
Enter values to sort!
Enter another command or enter 'e' to exit

```

Here the user enters no values to sort, the user is told to enter values.

#### “encrypt” command

##### Valid command sent

```

C:\Users\Faazil\IdeaProjects\FileAppClient\src>java Client
Enter from commands from list:
'upload (name)' - upload an image with name if file is in current directory
'download (name)' - download an image with given name
'sort (values)' - sorts given values
'encrypt (text)' - encrypts given text
'decrypt (text)' - decrypts encrypted text
'triarea (height) (base)' - calculates area of a triangle given height and base
'e' - exit from program

encrypt hello
Encrypted Message:
aGVsbG8=
Enter another command or enter 'e' to exit

```

User enters valid input and is given the encrypted message.

### Invalid commands

```

C:\Users\Faazil\IdeaProjects\FileAppClient\src>java Client
Enter from commands from list:
'upload (name)' - upload an image with name if file is in current directory
'download (name)' - download an image with given name
'sort (values)' - sorts given values
'encrypt (text)' - encrypts given text
'decrypt (text)' - decrypts encrypted text
'triarea (height) (base)' - calculates area of a triangle given height and base
'e' - exit from program

encrypt
Enter a string to encrypt!
Enter another command or enter 'e' to exit

```

Here the user does not enter a string to encrypt, they are told to enter a string next time.

### “decrypt” command

#### Valid command sent

```

C:\Users\Faazil\IdeaProjects\FileAppClient\src>java Client
Enter from commands from list:
'upload (name)' - upload an image with name if file is in current directory
'download (name)' - download an image with given name
'sort (values)' - sorts given values
'encrypt (text)' - encrypts given text
'decrypt (text)' - decrypts encrypted text
'triarea (height) (base)' - calculates area of a triangle given height and base
'e' - exit from program

decrypt aGVsbG8=
Decrypted Message:
hello
Enter another command or enter 'e' to exit

```

Here the user inputs a string to decrypt, user is given the decrypted message

#### Invalid commands

```

C:\Users\Faazil\IdeaProjects\FileAppClient\src>java Client
Enter from commands from list:
'upload (name)' - upload an image with name if file is in current directory
'download (name)' - download an image with given name
'sort (values)' - sorts given values
'encrypt (text)' - encrypts given text
'decrypt (text)' - decrypts encrypted text
'triarea (height) (base)' - calculates area of a triangle given height and base
'e' - exit from program

decrypt
Enter a string to decrypt!
Enter another command or enter 'e' to exit

```

Here the user does not enter a string to decrypt, user is then told to enter a string next time they use the command.

#### “triarea” command

##### Valid command sent



```
C:\Users\Faazil\IdeaProjects\FileAppClient\src>java Client
Enter from commands from list:
'upload (name)' - upload an image with name if file is in current directory
'download (name)' - download an image with given name
'sort (values)' - sorts given values
'encrypt (text)' - encrypts given text
'decrypt (text)' - decrypts encrypted text
'triarea (height) (base)' - calculates area of a triangle given height and base
'e' - exit from program

triarea 5 2
Area of the triangle is : 5.0
Enter another command or enter 'e' to exit
```

User enters valid input, the area of the triangle is computed and outputted.

#### **Invalid commands**

```
C:\Users\Faazil\IdeaProjects\FileAppClient\src>java Client
Enter from commands from list:
'upload (name)' - upload an image with name if file is in current directory
'download (name)' - download an image with given name
'sort (values)' - sorts given values
'encrypt (text)' - encrypts given text
'decrypt (text)' - decrypts encrypted text
'triarea (height) (base)' - calculates area of a triangle given height and base
'e' - exit from program

triarea invalid input
Invalid input, please enter number values!
Enter another command or enter 'e' to exit
```

Here the user enters invalid input (strings), they are told to enter number values next time.

```
C:\Users\Faazil\IdeaProjects\FileAppClient\src>java Client
Enter from commands from list:
'upload (name)' - upload an image with name if file is in current directory
'download (name)' - download an image with given name
'sort (values)' - sorts given values
'encrypt (text)' - encrypts given text
'decrypt (text)' - decrypts encrypted text
'triarea (height) (base)' - calculates area of a triangle given height and base
'e' - exit from program

triarea
Enter both a base and a height!
Enter another command or enter 'e' to exit
```

Here the user does not enter a base and a height, they are told to enter both those values and are given the chance to enter another command.