# Data Structures and Algorithms in Java

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- 1.1. Clipboard History
- 1.2. MD5 Checksum
- 1.3. Web Status

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## **Clipboard History**

### Working

Clipboard History gives the history of text copied to clipboard during the execution of program by pushing the copied value to stack and returning it when needed.

## **Clipboard History**

#### Code which uses Stack

If the newly copied text is not similar to previously copied text, then add newly copied text to stack; override the previous one and print it.

## **Clipboard History**

#### Code which uses Stack

Copy the current clipboard history to a temporary stack, then pop each value of temporary stack until all values are popped.

```
[...]
public static void stored() {
        Stack<String> temp = stored.copy();
        for (int i = 0; i < (stored.top() + 1); ++i) {
            System.out.println((i+1) + ": " + temp.pop());
        }
}
[...]</pre>
```

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## MD5 (Message Digest) Checksum

#### What is MD5?

MD5 is a cryptographic hash protocol commonly used for verifying integrity of files. It produces a value in hexadecimal format, always producing 128-bit hash value. It has been found to suffer from extensive vulnerabilities making it cryptographically broken and insecure.

## **MD5 Algorithm**

### Usage of Stack

Using Message Digest class of inbuilt Java library, MD5 of a certain file is determined by reading file data and conversion of hexadecimal format. Whenever file is modified or corrupted, the program monitoring that code logs the entry into the stack and returns the log when needed.

```
[...]
while (true) {
      String temp = Checksum.read(file);
      [...]
      if (!temp.equals(checksum)) {
          System.out.println("Checksum: " + temp);
          stack.push(temp);
          checksum = temp;
```

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### Web Status

#### Web Status

Web Status gives current status of a website and its current status code. It also gives a cat image of status code (Credits: https://http.cat/) depending upon corresponding command.

```
[...]
trv {
  URL url = new URL(site):
  HttpURLConnection connection = (HttpURLConnection)url
                                                 .openConnection();
  connection.connect();
  return connection.getResponseCode();
} catch (MalformedURLException e) {
        System.out.println("Invalid URL");
Γ...
```

### List of HTTP Status Codes

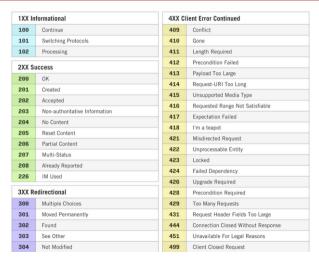


Figure: List of HTTP Codes (Credits: https://github.com/sandrabosk/)

### List of HTTP Status Codes

305	Use Proxy	5XX Server Error	
307	Temporary Redirect	07.11.1	
308	Permanent Redirect	500	Internal Server Error
		501	Not Implemented
4XX Client Error		502	Bad Gateway
400	Bad Request	503	Service Unavailable
401	Unauthorized	504	Gateway Timeout
402	Payment Required	505	HTTP Version Not Supported
403	Forbidden	506	Variant Also Negotiates
404	Not Found	507	Insufficient Storage
405	Method Not Allowed	508	Loop Detected
406	Not Acceptable	510	Not Extended
407	Proxy Authentication Required	511	Network Authentication Required
408	Request Timeout	599	Network Connect Timeout Error

Figure: List of HTTP Codes (Credits: https://github.com/sandrabosk/)

### Web Status

### Usage of Stack

Everytime a certain website status is fetched, the program logs the entry as long as it is running. When asked for cat picture, it halts the program and shows the corresponding picture.