Data Structures and Algorithms in Java

21AIE111

Dhanush Kovi

Student
Center for Excellence in Computational Engineering & Networking

July 23, 2022

Table of Contents

Table of Contents

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.

```
[...]
public static String readClipboard() throws [...] {
    return (String) Toolkit.getDefaultToolkit()
                           .getSystemClipboard()
                           .getData(DataFlavor.stringFlavor);
}
[...]
```

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.

```
[...]
if (!newCopied.equals(oldCopied)) {
            stored.push(newCopied);
            oldCopied = newCopied;
            System.out.println(oldCopied); // prints newCopied
}
[...]
```

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());
      }
}
[...]
```

Table of Contents

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;
      }
  }
[...]
```

Table of Contents

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.

```
[...]
try {
  URL url = new URL(site);
  HttpURLConnection connection = (HttpURLConnection)url
                                                .openConnection();
  connection.connect();

  return connection.getResponseCode();
} catch (MalformedURLException e) {
        System.out.println("Invalid URL");
}
[...]
```

List of HTTP Status Codes

1XX Informational	
100	Continue
101	Switching Protocols
102	Processing

2XX Success	
200	OK
201	Created
202	Accepted
203	Non-authoritative Information
204	No Content
205	Reset Content
206	Partial Content
207	Multi-Status
208	Already Reported
226	IM Used

3XX Redirectional	
300	Multiple Choices
301	Moved Permanently
302	Found
303	See Other
304	Not Modified

4XX Client Error Continued	
409	Conflict
410	Gone
411	Length Required
412	Precondition Failed
413	Payload Too Large
414	Request-URI Too Long
415	Unsupported Media Type
416	Requested Range Not Satisfiable
417	Expectation Failed
418	I'm a teapot
421	Misdirected Request
422	Unprocessable Entity
423	Locked
424	Failed Dependency
426	Upgrade Required
428	Precondition Required
429	Too Many Requests
431	Request Header Fields Too Large
444	Connection Closed Without Response
451	Unavailable For Legal Reasons
499	Client Closed Request

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

List of HTTP Status Codes

305	Use Proxy
307	Temporary Redirect
308	Permanent Redirect

4XX Client Error	
400	Bad Request
401	Unauthorized
402	Payment Required
403	Forbidden
404	Not Found
405	Method Not Allowed
406	Not Acceptable
407	Proxy Authentication Required
408	Request Timeout

5XX Server Error	
500	Internal Server Error
501	Not Implemented
502	Bad Gateway
503	Service Unavailable
504	Gateway Timeout
505	HTTP Version Not Supported
506	Variant Also Negotiates
507	Insufficient Storage
508	Loop Detected
510	Not Extended
511	Network Authentication Required
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.

```
[...]
try {
  int status = WebStatus.status(parts[1]);
  System.out.println(parts[1] + ": " + status);
  stack.push(parts[1] + ": " + status + " - "
                                    + WebStatus.interpret(status));
} catch (IOException e) {
    System.out.println("Invalid URL");
}
[...]
```