

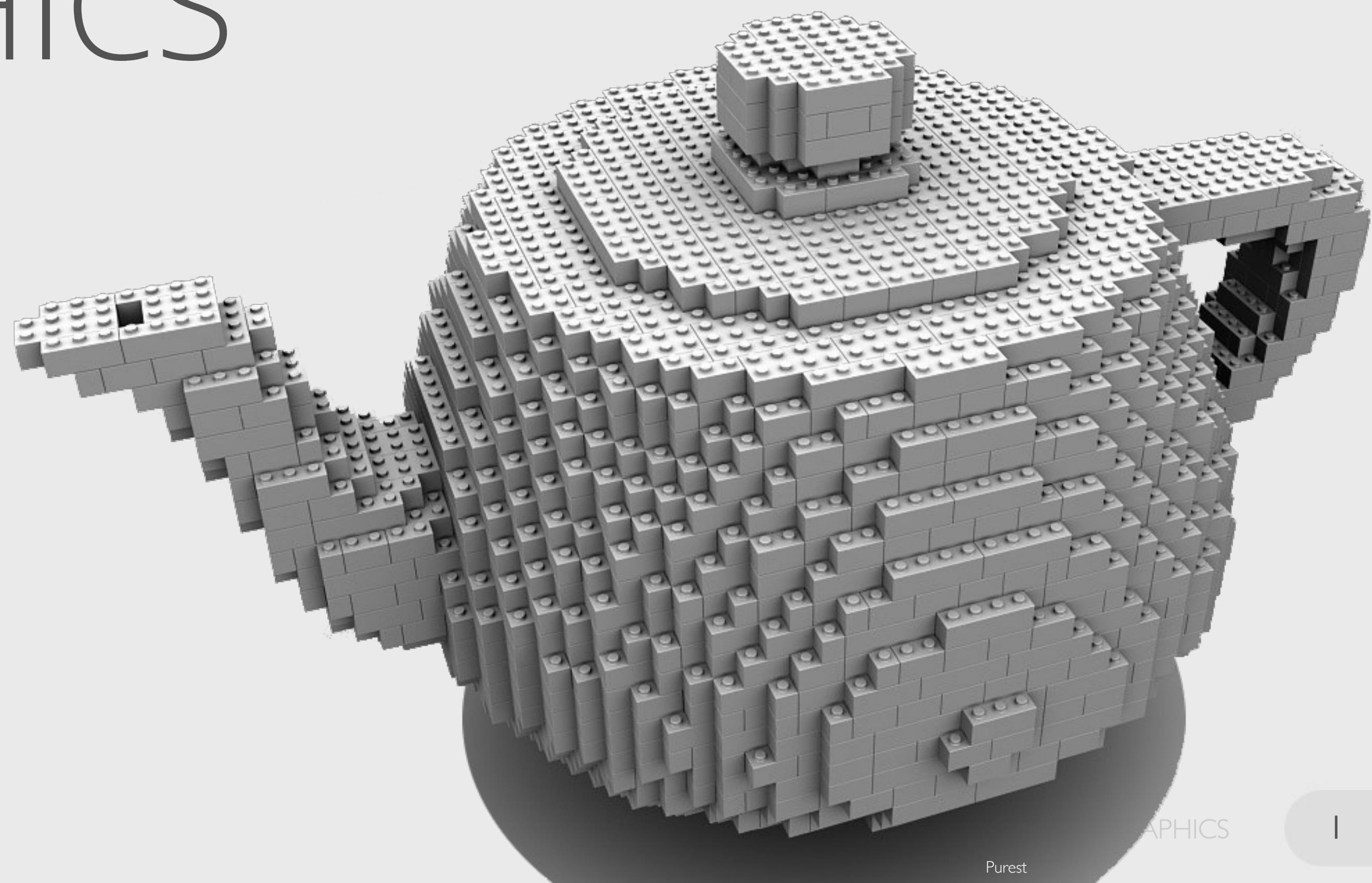


MULTIMEDIA & COMPUTER GRAPHICS

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Ing. Bernardo Moya de la Mora

VIDEO MANIPULATION



NEVER USE FOO, BAR, BAZ ...

```
public class Foo {  
    private Foo foo;  
    public Foo() {  
        foo = foo();  
    }  
    public Foo FOO() {  
        System.out.println("Foo");  
        return foo;  
    }  
    public Foo FOO(String FOO) {  
        return FOO();  
    }  
    public Foo foo() {  
        return this;  
    }  
    public static void main(String[] f0o) {  
        Foo foo = new Foo().foo.FOO().FOO("FOO").foo.foo.foo.FOO();  
        foo.FOO("FOO").foo.foo.FOO().foo.FOO("FOO").FOO().foo.FOO();  
    }  
}
```



BAD HABITS IN CODING



DOCUMENTATION

Comment classes & methods

Avoid commenting every line

Significant comments



PACKAGE CLASS USE TREE DEPRECATED INDEX HELP

PREV CLASS NEXT CLASS FRAMES NO FRAMES

SUMMARY: NESTED | FIELD | CONSTR | METHOD DETAIL: FIELD | CONSTR | METHOD

com.baeldung.javadoc

Class SuperHero

java.lang.Object
 com.baeldung.javadoc.Person
 com.baeldung.javadoc.SuperHero

public class **SuperHero**
extends Person

Hero is the main entity we will be using to ...

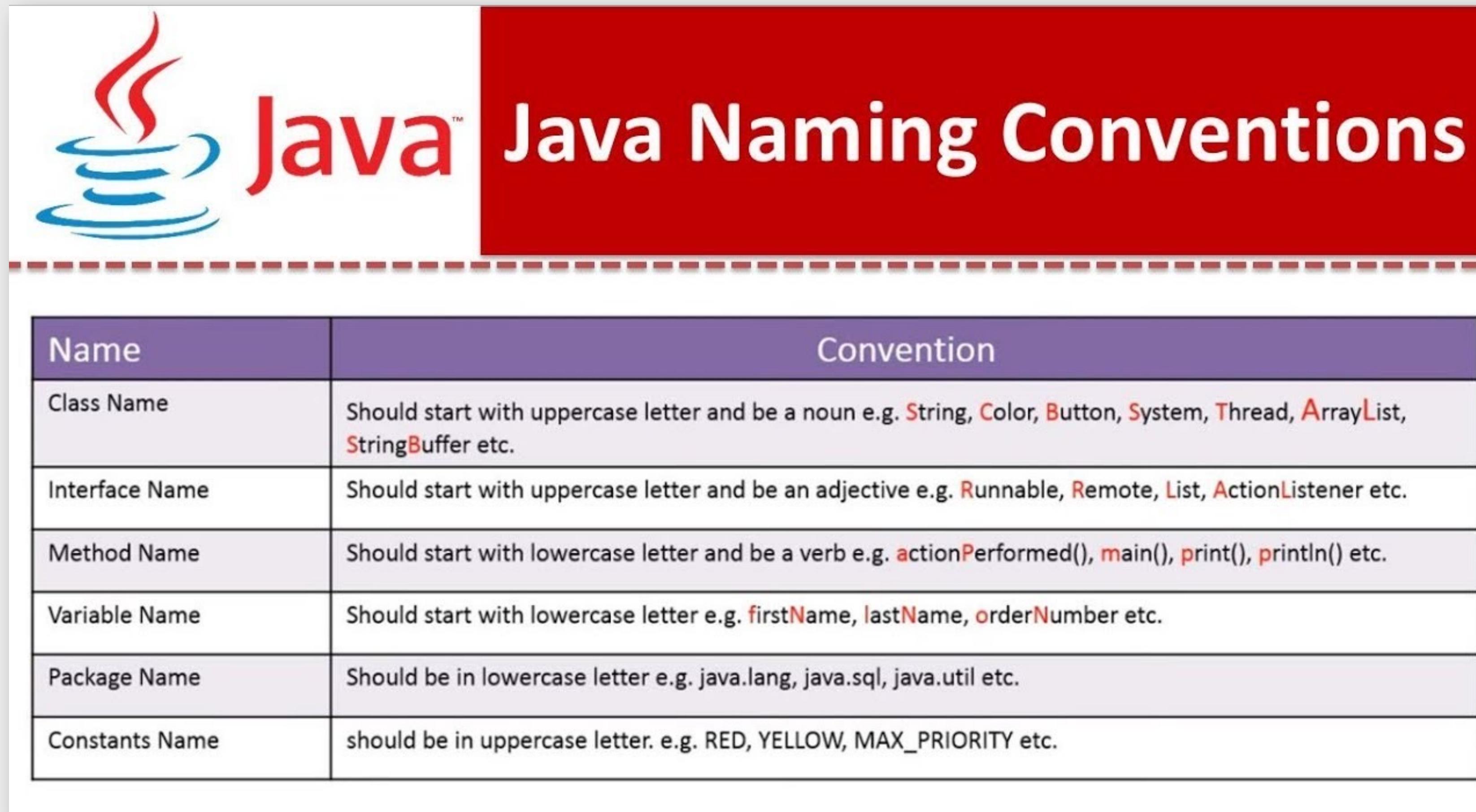
Author:
Captain America

Field Summary

Fields

Modifier and Type	Field and Description
private int	defense
private int	health
private java.lang.String	heroName The public name of a hero that is common knowledge
private java.lang.String	uniquePower

NAMING CONVENTIONS



The slide features the Java logo on the left and the title "Java Naming Conventions" in large white text on a red background. Below the title is a table with six rows, each containing a name type and its corresponding naming convention.

Name	Convention
Class Name	Should start with uppercase letter and be a noun e.g. String, Color, Button, System, Thread, ArrayList, StringBuffer etc.
Interface Name	Should start with uppercase letter and be an adjective e.g. Runnable, Remote, List, ActionListener etc.
Method Name	Should start with lowercase letter and be a verb e.g. actionPerformed(), main(), print(), println() etc.
Variable Name	Should start with lowercase letter e.g. firstName, lastName, orderNumber etc.
Package Name	Should be in lowercase letter e.g. java.lang, java.sql, java.util etc.
Constants Name	should be in uppercase letter. e.g. RED, YELLOW, MAX_PRIORITY etc.



TESTING



Avoid throwing exceptions
Poka Yoke
JUnits

DATA STRUCTURES

Data Structure	Time Complexity								Space Complexity	
	Average				Worst					
	Access	Search	Insertion	Deletion	Access	Search	Insertion	Deletion		
Array	$\Theta(1)$	$\Theta(n)$	$\Theta(n)$	$\Theta(n)$	$O(1)$	$O(n)$	$O(n)$	$O(n)$	$O(n)$	
Stack	$\Theta(n)$	$\Theta(n)$	$\Theta(1)$	$\Theta(1)$	$O(n)$	$O(n)$	$O(1)$	$O(1)$	$O(n)$	
Queue	$\Theta(n)$	$\Theta(n)$	$\Theta(1)$	$\Theta(1)$	$O(n)$	$O(n)$	$O(1)$	$O(1)$	$O(n)$	
Singly-Linked List	$\Theta(n)$	$\Theta(n)$	$\Theta(1)$	$\Theta(1)$	$O(n)$	$O(n)$	$O(1)$	$O(1)$	$O(n)$	
Doubly-Linked List	$\Theta(n)$	$\Theta(n)$	$\Theta(1)$	$\Theta(1)$	$O(n)$	$O(n)$	$O(1)$	$O(1)$	$O(n)$	
Skip List	$\Theta(\log(n))$	$\Theta(\log(n))$	$\Theta(\log(n))$	$\Theta(\log(n))$	$O(n)$	$O(n)$	$O(n)$	$O(n)$	$O(n \log(n))$	
Hash Table	N/A	$\Theta(1)$	$\Theta(1)$	$\Theta(1)$	N/A	$O(n)$	$O(n)$	$O(n)$	$O(n)$	
Binary Search Tree	$\Theta(\log(n))$	$\Theta(\log(n))$	$\Theta(\log(n))$	$\Theta(\log(n))$	$O(n)$	$O(n)$	$O(n)$	$O(n)$	$O(n)$	
Cartesian Tree	N/A	$\Theta(\log(n))$	$\Theta(\log(n))$	$\Theta(\log(n))$	N/A	$O(n)$	$O(n)$	$O(n)$	$O(n)$	
B-Tree	$\Theta(\log(n))$	$\Theta(\log(n))$	$\Theta(\log(n))$	$\Theta(\log(n))$	$O(\log(n))$	$O(\log(n))$	$O(\log(n))$	$O(\log(n))$	$O(n)$	
Red-Black Tree	$\Theta(\log(n))$	$\Theta(\log(n))$	$\Theta(\log(n))$	$\Theta(\log(n))$	$O(\log(n))$	$O(\log(n))$	$O(\log(n))$	$O(\log(n))$	$O(n)$	
Splay Tree	N/A	$\Theta(\log(n))$	$\Theta(\log(n))$	$\Theta(\log(n))$	N/A	$O(\log(n))$	$O(\log(n))$	$O(\log(n))$	$O(n)$	
AVL Tree	$\Theta(\log(n))$	$\Theta(\log(n))$	$\Theta(\log(n))$	$\Theta(\log(n))$	$O(\log(n))$	$O(\log(n))$	$O(\log(n))$	$O(\log(n))$	$O(n)$	
KD Tree	$\Theta(\log(n))$	$\Theta(\log(n))$	$\Theta(\log(n))$	$\Theta(\log(n))$	$O(n)$	$O(n)$	$O(n)$	$O(n)$	$O(n)$	



VIDEO

Frame rate

Bitrate

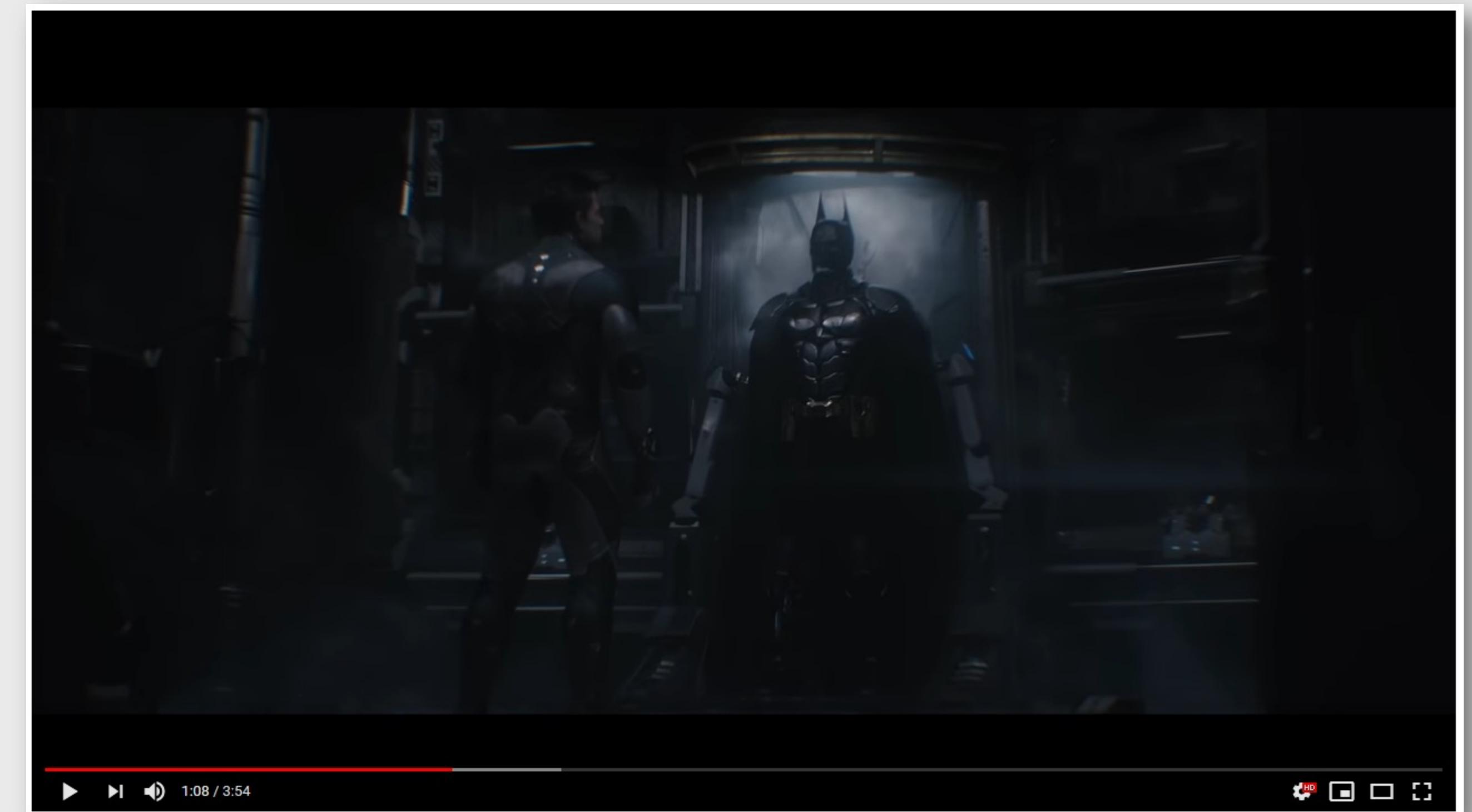
Resolution

Codec

Format

Profile

File Size



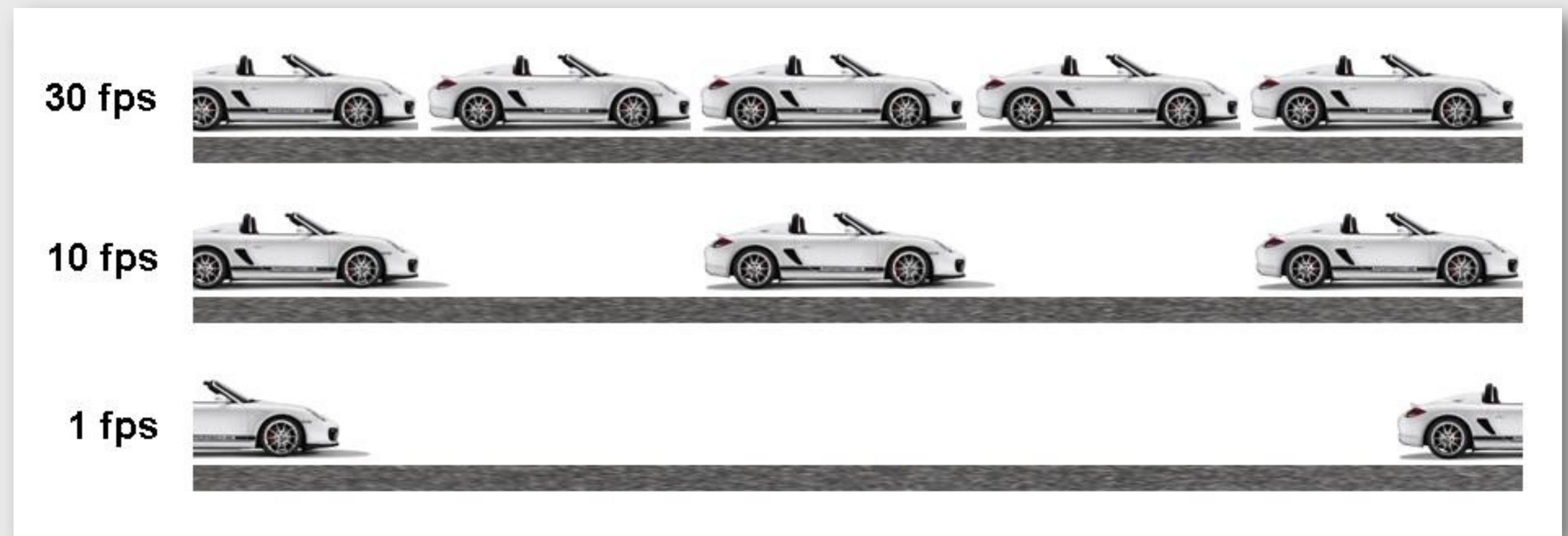
FRAME RATE

NTSC - 29.97

PAL - 25

Videogames - 30

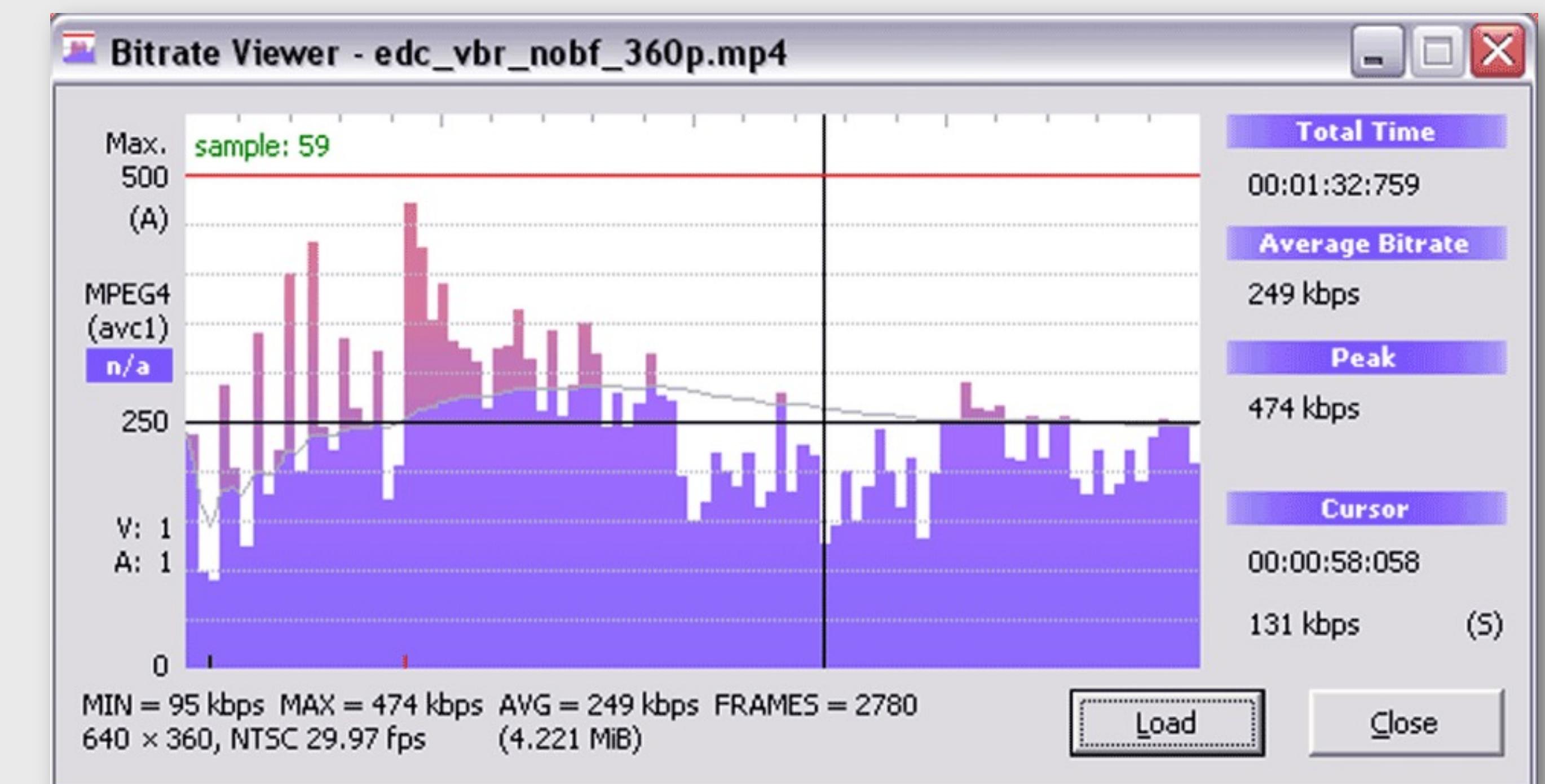
VR - 90



BITRATE

CBR (Constant Bit-Rate)

VBR (Variable Bit-Rate)



BITRATE

Recommended video bitrates for SDR uploads

To view new 4K uploads in 4K, use a browser or device that supports VP9.

Type	Video Bitrate, Standard Frame Rate (24, 25, 30)	Video Bitrate, High Frame Rate (48, 50, 60)
2160p (4k)	35-45 Mbps	53-68 Mbps
1440p (2k)	16 Mbps	24 Mbps
1080p	8 Mbps	12 Mbps
720p	5 Mbps	7.5 Mbps
480p	2.5 Mbps	4 Mbps
360p	1 Mbps	1.5 Mbps

Recommended video bitrates for HDR uploads

Type	Video Bitrate, Standard Frame Rate (24, 25, 30)	Video Bitrate, High Frame Rate (48, 50, 60)
2160p (4k)	44-56 Mbps	66-85 Mbps
1440p (2k)	20 Mbps	30 Mbps
1080p	10 Mbps	15 Mbps
720p	6.5 Mbps	9.5 Mbps
480p	Not supported	Not supported
360p	Not supported	Not supported

YouTube recommendations



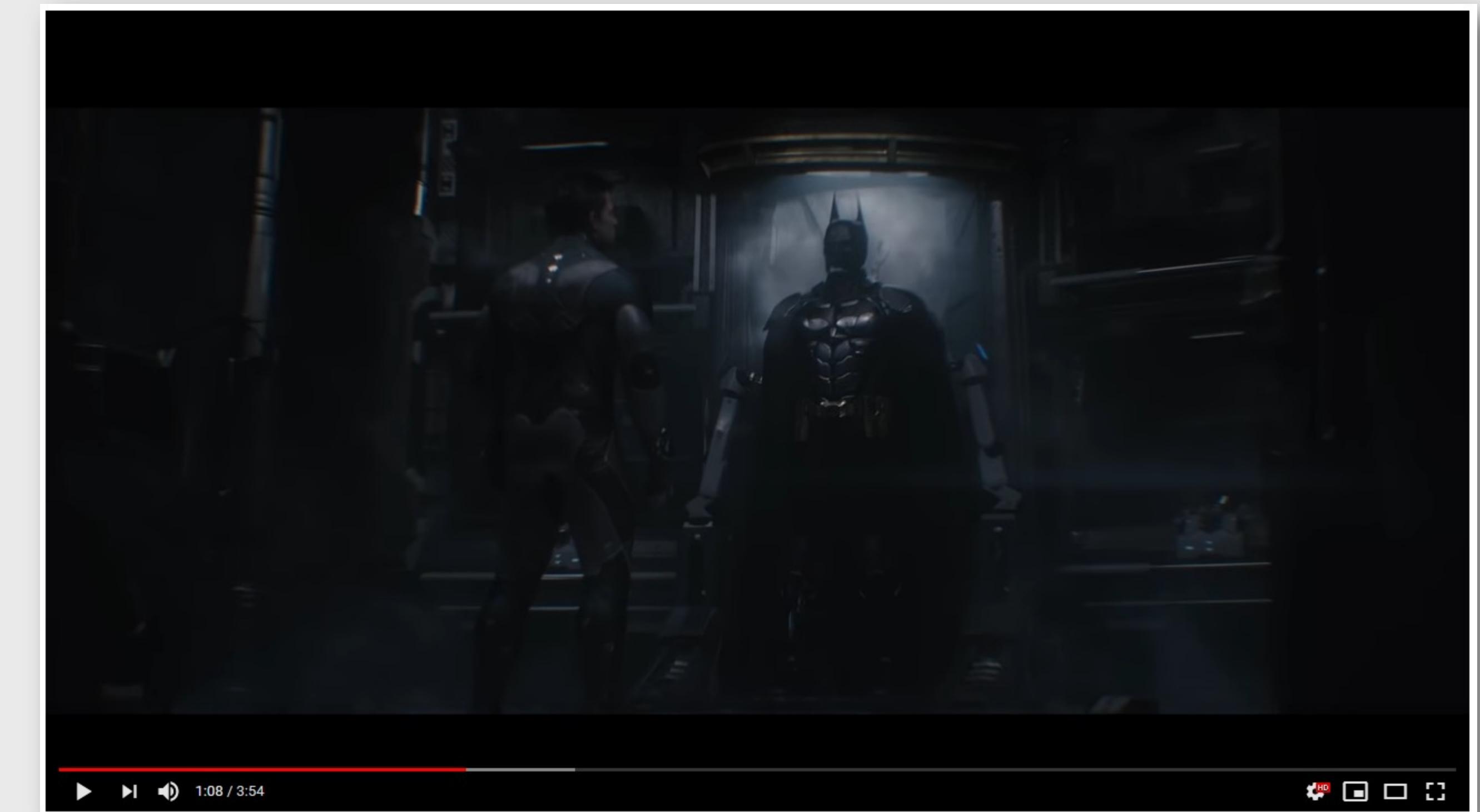
RESOLUTION

Width x Height

Aspect Ratio

720i/720p

360/480/720/1080/2k/4k



CODEC

Compress and decompress

H.264 / MPEG-4 AVC

MJPEG (Motion JPEG)

DV and HDV

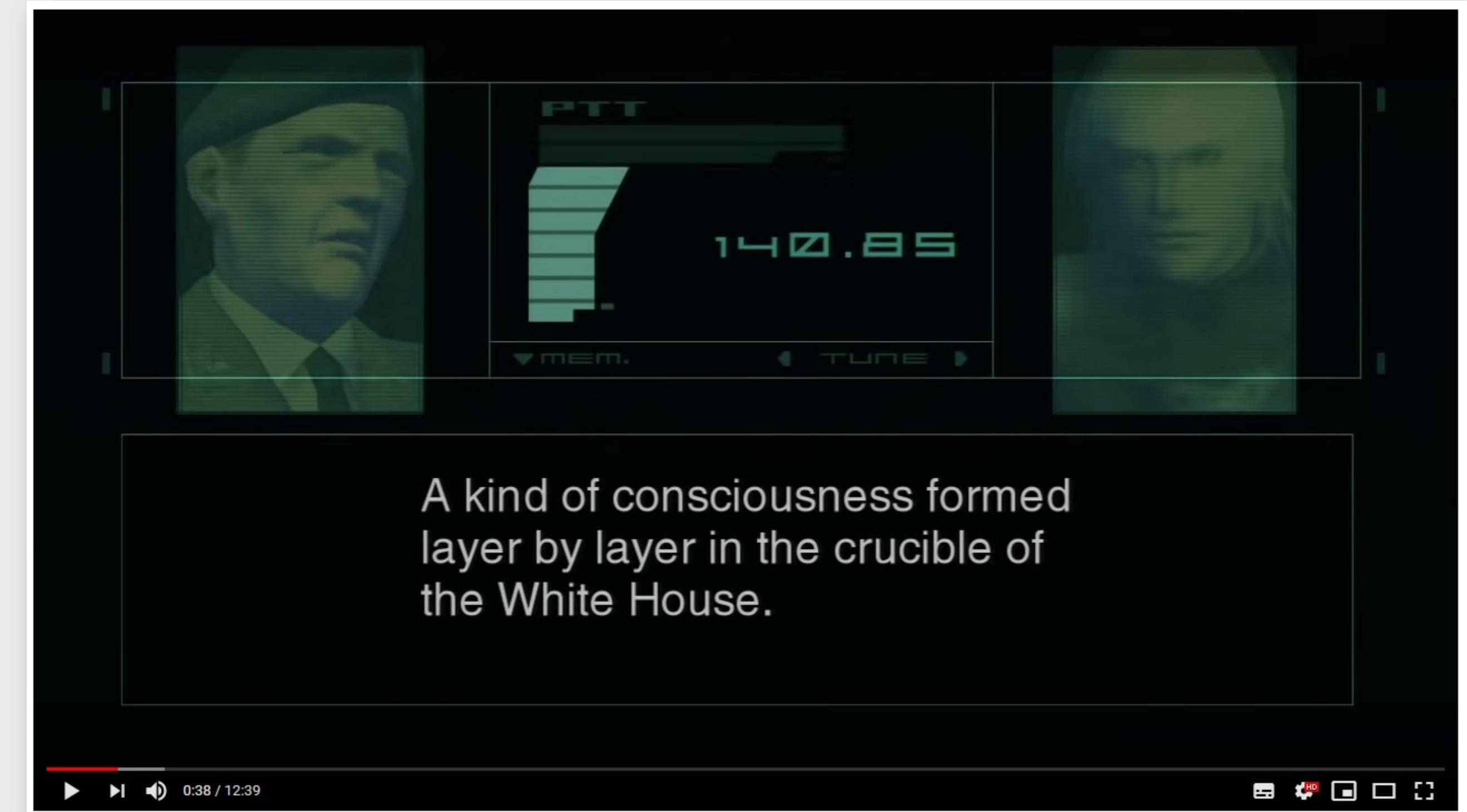
MPEG-2 (H.262)

Microsoft VC-1

MPEG-1



WMV (Windows Media Video)



FORMAT

Known as the container

Includes video and audio

ASF / AVI / MP4 / MOV / WMV

MKV (Matroska Multimedia Container)

Includes video/audio/subs/chapters/cover art/ratings/descriptions and more



PROFILE

Different set of capabilities

H.264

Baseline Profile (can achieve 1000:1)

Main Profile

High Profile (can achieve 2000:1)



FILE SIZE

File size = bitrate (kilobits per second) x duration

Bitrate = Audio bitrate + Video bitrate

BitRate 5222.22kbps Resolution 1280x720 Frame Rate 1FPS

Bits/pixel 5.52541



YOUTUBE

Container: MP4

Audio codec: AAC-LC

Video codec: H.264

Frame rate: 24/25/30/48/50/60/Others

Aspect ratio: 16:9



EXERCISE

Whatsapp Limit 16MB

Container: MP4

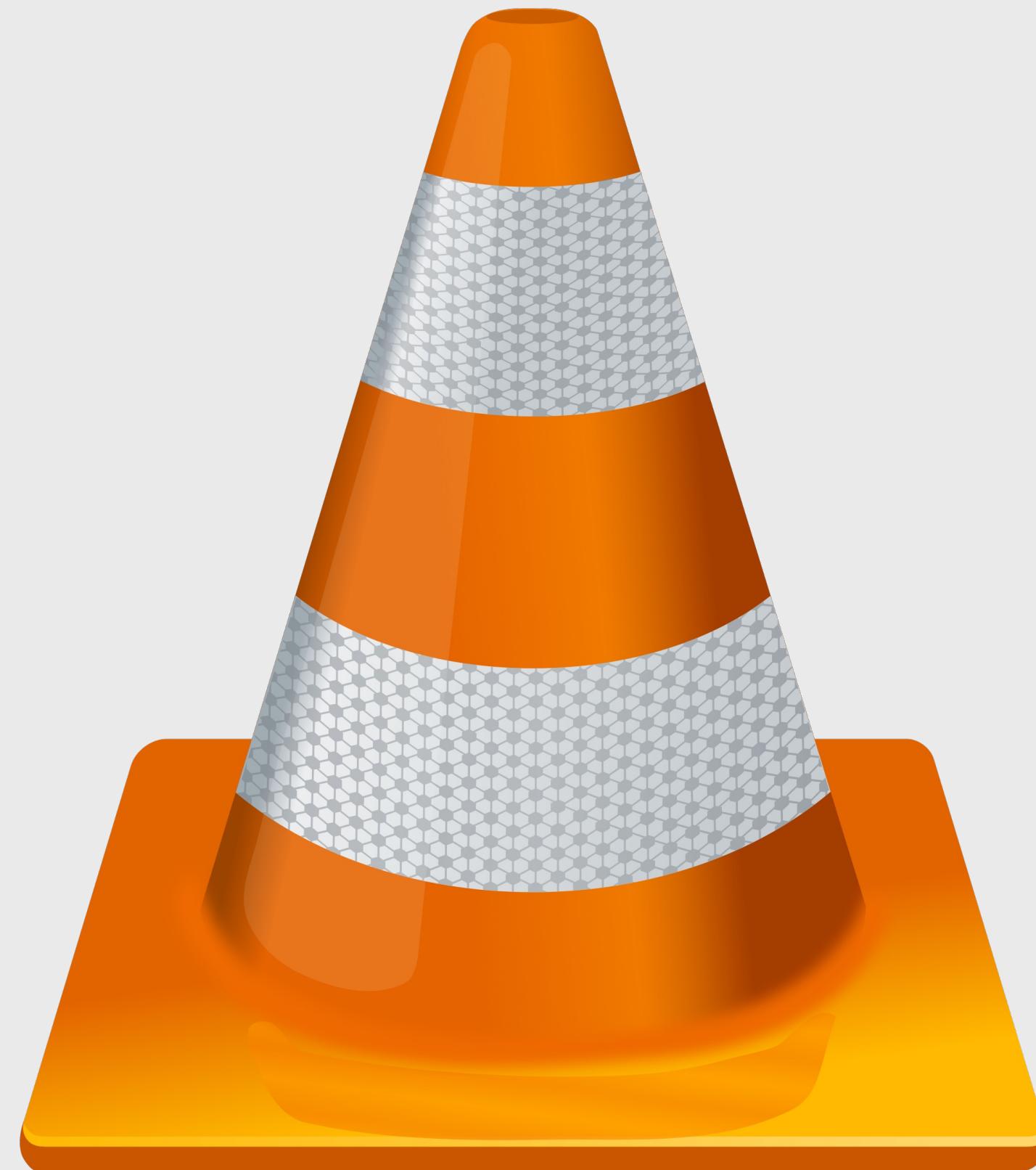
Codecs: H.264 / MPEG-4 / AAC / AC3

Length: 1 minute



What resolution and bitrate should it be?

BIOGRAPHY – VIDEOLAN CLIENT

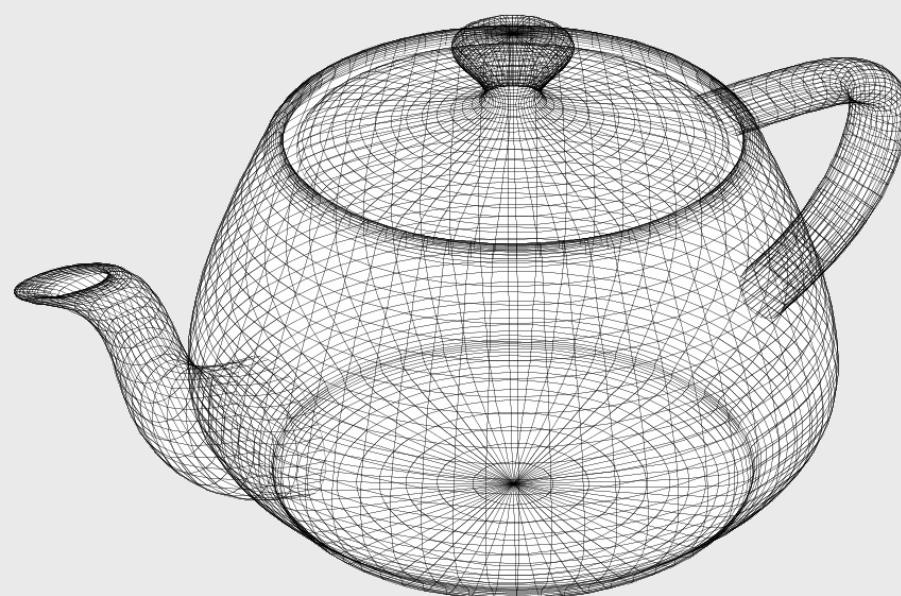


Normal mode (400 pts)
Write a one page biography including most important contributions and write the report on LaTeX and send PDF and .tex file



Deadline: Thursday Feb 27, 3.59pm

REFLECTION



Pato

Charly

Carlos S

Dubin

Emiliano

Jaime

Valeria

Kenzo

Rodrigo

Cracklitos

Omar

Soto

Samuel

Fátima

