Metadata Analysis Assignment

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Metadata is “Data about Data” like :

- Title, creator, keywords, genre
- Resolution, codec, file format, bitrate
- Copyright, licenses, creation date
- Chapters in video, the order of tracks

Metadata analysis can be perform using various tools like Exiftool a CLI tool, Online tools like Metadata2Go, Google Lens an AI based Reverse Image Search, Object detection & Sentiment Analysis. There are also Media Access Management (MAM) systems to make entire media searchable, and allowed to analyse.

In this assignment, An image has been taken from a CTF challenge to perform all kinds of analysis, which is shown below.

Fig1: Sample CTF Challenge image name dollz

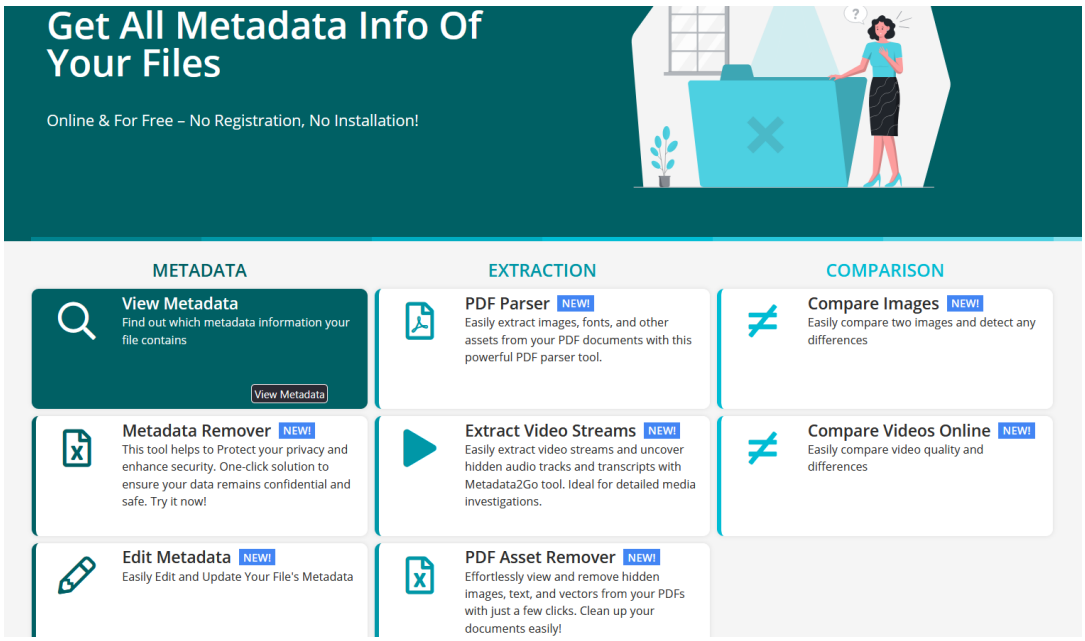

Fig2: Metadata2Go Online Tools for metadata analysis

The challenge questions were:

1. What was the make of the camera?
2. What was the camera model name?

3. What city was the picture taken in?
4. When was the picture taken?

Metadata of dollz	
Checksum	b257cd86c19f40eeef0614a61ac9da8d
Filename	dollz.jpeg
Filesize	3.9 MB
Filetype	JPEG
Filetypeextension	jpg
Mimetype	image/jpeg
Orientation	Horizontal (normal)
Xresolution	72
Yresolution	72
Resolutionunit	inches
Software	HDR+ 1.0.188906806z
Modifydate	2018:03:27 18:24:50
Artist	l33t
Datetimeoriginal	2018:03:27 18:24:50
Createdate	2018:03:27 18:24:50
Componentsconfiguration	Y, Cb, Cr, -
Aperture	2
Imagesize	3036x4048
Megapixels	12.3

Fig3: Metadata analysis of the image in pdf format

```
└─$ file dollz.jpeg
dollz.jpeg: JPEG image data, Exif standard: [TIFF image data, little-endian, direntries=16, height=4048, compression=
JPEG (old), description=NO CODE EXECUTION ALLOWED HERE, manufacturer=3-Letter Agency, model=SpyCamera, orientation=up
per-left, xresolution=264, yresolution=272, resolutionunit=2, software=HDR+ 1.0.188906806z, datetime=2018:03:27 18:24
:50, width=3036], baseline, precision 8, 3036x4048, components 3
```

Fig4: Checking file-type using file command

```
File Size                       : 3.9 MB
File Modification Date/Time     : 2025:09:29 16:11:20+05:30
File Access Date/Time           : 2025:09:29 16:29:06+05:30
File Inode Change Date/Time     : 2025:09:29 16:26:43+05:30
File Permissions                : -rwxrwxrwx
File Type                       : JPEG
File Type Extension             : jpg
MIME Type                       : image/jpeg
Exif Byte Order                 : Little-endian (Intel, II)
Compression                     : JPEG (old-style)
Image Description               : NO CODE EXECUTION ALLOWED HERE
Make                            : 3-Letter Agency
Camera Model Name               : SpyCamera
Orientation                     : Horizontal (normal)
X Resolution                    : 72
Y Resolution                    : 72
Resolution Unit                 : inches
Software                        : HDR+ 1.0.188906806z
Modify Date                     : 2018:03:27 18:24:50
Artist                          : l33t
Y Cb Cr Positioning             : Centered
Exposure Time                   : 1/120
F Number                        : 2.0
Exposure Program                : Program AE
ISO                             : 110
Exif Version                    : 0220
Date/Time Original              : 2018:03:27 18:24:50
```

Fig5: Exiftool Metadata showcase, part 1 (Make, Camera Model Name)

It is clearly visible that image description shows a text “NO CODE EXECUTION ALLOWED HERE”, and model is “SpyCamera”, and a lot of other data related to the image. Also, It is confirmed that the manufacturer of the camera is “3-letter-agency” and the model is “SpyCamera”. (Answer 1, 2)

```
Image Width                     : 3036
Image Height                    : 4048
Encoding Process                : Baseline DCT, Huffman coding
Bits Per Sample                 : 8
Color Components                : 3
Y Cb Cr Sub Sampling            : YCbCr4:2:0 (2 2)
Aperture                        : 2.0
Image Size                      : 3036x4048
Megapixels                      : 12.3
Scale Factor To 35 mm Equivalent: 5.5
Shutter Speed                   : 1/120
Create Date                     : 2018:03:27 18:24:50.149312
Date/Time Original              : 2018:03:27 18:24:50.149312
Modify Date                     : 2018:03:27 18:24:50.149312
Thumbnail Image                 : (Binary data 12778 bytes, use -b option to extract)
GPS Latitude                    : 45 deg 30' 20.85" N
GPS Longitude                   : 122 deg 39' 9.06" W
Circle Of Confusion             : 0.005 mm
Depth Of Field                  : 0.41 m (0.48 - 0.89 m)
Field Of View                   : 69.4 deg
Focal Length                    : 4.7 mm (35 mm equivalent: 26.0 mm)
GPS Position                    : 45 deg 30' 20.85" N, 122 deg 39' 9.06" W
Hyperfocal Distance             : 2.03 m
Light Value                     : 8.8
```

Fig6: Exiftool Metadata showcase, part 2 (GPS Latitude, GPS Longitude)

Next, is the GPS coordinates are areas of interest to solve the challenge.

45° 30′ 20.9″ N, 122° 39′ 9.1″ W

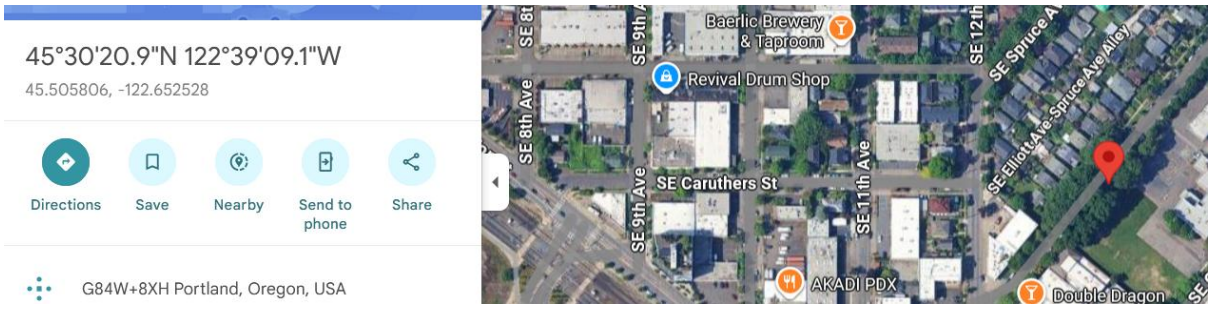

Fig7: Google maps shows coordinates to portland, Oregon (Answer 3)

The Creation data of the image is 27th March, 2018. (Answer 4)

Therefore, Challenge Solved!