ANNOTATED LIST OF FILE FORMATS:
ART/COMM 266 INTRO TO NEW MEDIA

HEIF

The HEIF file type/format is amongst the newest digital file formats in use today and is often associated with images taken on Apple devices. The HEIF acronym stands for **H**igh **E**fficiency **I**mage **F**ormat
This file format was developed by the Moving Pictures Experts Group (MPEG) during the early 2000's and was first deployed around 2013-2015. HEIF is often referred to as a container format since it can store still images, burst images and brief video content (live shots).HEIF is a lossy compressed format similar to JPEG files but with the ability to compress with greater efficiency and to retain greater quality than its predecessor. HEIF is becoming more widely accepted. It is often compared to the JPEG and boast some of the following advantages (as well as disadvantages):
It is said that HEIF files are approximately one half of the size of JPEG files. HEIF files are capable of recording 16-bit color depth despite their smaller size (a distinct advantage over the JPEG which is constrained to 8-bit color depth. This allows for better color rendering and the elimination of banding associated with 8-bit photos. HEIF files can store depth data; i.e., camera to subject distance and camera to background distance. HEIF files support transparency. HEIF can replace animated GIFs. HEIF can also provide for greater speed in image processing.

JPEG/JFIF

JPEG (Joint Photographic Experts Group) is a compression method; JPEG·compressed images are usually stored in the JFIF (JPEG File Interchange Format) file lormat. JPEG compression is (In most cases) lossy compression. The JPEG/JFIF filename extension is JPG or JPEG. Nearly every digital camera can save images in the JPEG/JFIF format, which supports 8·bit grayscale Images and 24·bit color images (8 bits each for red, green, and blue). JPEG applies lossy compression to images, which can result In a significant reduction of the file size. The amount of compression can be specified, and the amount of compression affects the visual quality of the resulting image. When not too great, the compression does not noticeably detract from the image's quality, but JPEG files suffer generational degradation when repeatedly edited and saved. (JPEG also provides lossless image storage, but the lossless version is not widely supported.)

JPEG 2000

JPEG 2000 is a compression standard enabling both lossless and lossy storage. The compression methods used are different from the ones in standard JFIF/JPEG; they improve quality and compression ratios, but also require more computational power to process. JPEG 2000 also adds features that are missing in the standard JPEG format. It is not nearly as common as JPEG, but it is used currently in professional movie editing and distribution (some digital cinemas, for example, use JPEG 2000 for Individual movie frames).

EXIF

The Exif (Exchangeable 1mage file format) format is a file standard similar to the JFIF format with TIFF extensions; it is incorporated in the JPEG-wnting software used in most cameras. Its

purpose is to record and to standardize the exchange of images with image metadata between digital cameras and editing and viewing software. The metadata are recorded for individual images and include such things as camera settings, time and date, shutter speed, exposure, image size, compression, name of camera, color information. When images are viewed or edited by image editing software, all of this image information can be displayed. The actual Exif metadata as such may be carried within different host formats, e.g. TIFF, JFIF (JPEG) or PNG. IFF·META is another example.

TIFF

The TIFF (Tagged Image File Format) format is a flexible format that normally saves 8 bits or 16 bits per color (red, green, blue) for 24·bit and 48·bittotals, respectively, usually using either the TIFF or TIF filename extension. TIFPs flexibility can be both an advantage and disadvantage, since a reader that reads every type of TIFF file does not exist. TIFFs can be lossy and lossless; some offer relatively good lossless compression for bi·level (black&wh1te) images. Some digital cameras can save in TIFF format, using the LZW compression algorithm for lossless storage. TIFF image format is not widely supported by web browsers. TIFF remains widely accepted as a photographic file standard in the printing business. TIFF can handle device-specific color spaces, such as the CMYK defined by a particular set of printing press inks. OCR (Optical Character Recognition) software packages commonly generate some (often monochromatic) form of TIFF image for scanned text pages.

RAW

RAW refers to raw image formats that are available on some digital cameras, rather than to a specific format. These formats usually use a lossless or nearly lossless compression, and produce file sizes smaller than the TIFF formats. Although there is a standard raw image format, (ISO 12234-2, TIFF/EP), the raw formats used by most cameras are not standardized or documented, and differ among camera manufacturers.
Most camera manufacturers have their own software for decoding or developing their raw file formats, but there are also many third party raw file converter applications available that accept raw files from most digital cameras. Some graphic programs and Image editors may not accept some or all raw file formats, and some older ones have been effectively orphaned already. Adobe's Digital Negative (DNG) specification is an attempt at standardizing a raw image format to be used by cameras, or for archival storage of image data converted from undocumented raw image formats, and is used by several niche and minority camera manufacturers including Pentax, Leica, and Samsung.
The raw image formats of more than 230 camera models, including those from manufacturers with the largest market shares such as Canon, N1kon, Phase One, Sony, and Olympus, can be converted to DNG.(1). DNG was based on ISO 12234·2, TIFFIEP, and ISO's rev1s1on of TIFFIEP is reported to be adding Adobe's modifications and developments made for DNG into profile 2 of the new version of the standard.

GIF

GIF (Graphics Interchange Format) is limited to an 8-bit palette, or 256 colors. This makes the GIF format suitable for storing graphics with relatively few colors such as simple diagrams, shapes, logos and cartoon style images. The GIF format supports animation and is still widely used to provide image animation effects. It also uses a lossless compression that Is more

effective when large areas have a single color, and ineffective for detailed images or dithered images.

BMP

The BMP file format (Windows bitmap) handles graphics flies within the Microsoft Windows OS. Typically, BMP files are uncompressed, hence they are large; the advantage is their simplicity and wide acceptance in Windows programs.

PNG

The PNG (Portable Network Graphics) file format was created as the free, open-source successor to GIF. The PNG file format supports 8 bit paletted Images (with optional transparency
for all palette colors) and 24 bit truecolor (16 million colors) or 48 bit truecolor with and without
alpha channel - while GIF supports only 256 colors and a single transparent color. Compared to JPEG, PNG excels when the image has large, uniformly colored areas. Thus lossless PNG format is best suited for pictures still under edition - and the lossy formats, like JPEG, are best for
the final distribution of photographic Images, because in this case JPG files are usually smaller than PNG files. The Adam7-lnterlacing allows an early prev1ew, even when only a small percentage of the image data has been transmitted.

PNG provides a patent-free replacement for GIF and can also replace many common uses of TIFF. Indexed-color, grayscale, and truecolor images are supported, plus an optional alpha channel.

PNG is designed to work well in online viewing applications like web browsers so it is fully streamable with a progressive display option. PNG is robust, providing both full file integnty checking and simple detection of common transmission errors. Also, PNG can store gamma and chromaticity data for improved color matching on heterogeneous platforms. Some programs do not handle PNG gamma correctly, which can cause the Images to be saved or displayed darker than they should be.[21

PSD

Photoshop files have default file extension as .PSD, which stands for "Photoshop Document. A PSD file stores an image with support for most imaging options available In Photoshop. These include layers with masks, color spaces, ICC profiles, CMYK Mode (used for commercial pnnting), transparency, text, alpha channels and spot colors, clipplng paths, and duotone settings. This is in contrast to many other file formats (e.g. .JPG or .GIF) that restrict content to
provide streamlined, predictable functionality. A PSD file has a maximum height and width of 30,000 pixels, and a length limit of 3 Gigabytes.

Photoshop files sometimes have the file extension .PSB, which stands for "Photoshop Big" (also known as "large document format"). A PSB file extends the PSD file format, Increasing the maximum height and width to 300,000 pixels and the length limit to around 4 Exabytes. The dimension limit was apparently chosen arbitrarily by Adobe, not based on computer arithmetic

constraints (it is not close to a power of two, as Is 30,000) but for ease of software testing PSD and PSB formats are documented.

Because of Photoshop's popularity (and due to Its quality programming), PSD files are widely used and supported to some extent by most competing software. The .PSD file format can be exported to and from Adobe's other apps like Adobe Illustrator, Adobe Premiere Pro, and After Effects, to make professional standard DVDs and provide non-linear editing and special effects services, such as backgrounds, textures, and so on, for television, film, and the web. Photoshop's
primary strength is as a pixel·based Image editor, unlike vector-based image editors. Photoshop also enables vector graphics editing through Its Paths, Pen tools, Shape tools, Shape Layers, Type tools, Import command, and Smart Object functions. These tools and commands are convenient to combine pixel-based and vector-based Images In one Photoshop document, because it may not be necessary to use more than one program.

WEBP

WebP is a new Image format that uses lossy compression. It was designed by Google to reduce image file s1ze to speed up web page loading: its principal purpose Is to supersede JPEG as the primary format for photographs on the web.
WebP Is based on VPS's intra-frame coding and uses a container based on RIFF.

PICT

PICT is a graphical file format that appeared with the Apple's original Macintosh computer after its introduction in 1984. It is designed to permit the exchange of both bitmapped and vector graphics for a variety of Macintosh applications. The file format is still used although dated in its functionality.

TARGA

TARGA (**Truevision, a.k.a. TGA or .tga)**, often referred to as **TARGA**, is a raster graphics file format created by Truevision Inc. (now part of Avid Technology). It was the native format of TARGA and VISTA boards, which were the first graphic cards for IBM-compatible PCs to support Highcolor/truecolor display. This family of graphic cards was intended for professional computer image synthesis and video editing with PCs; for this reason, usual resolutions of TGA image files match those of the NTSC and PAL video formats.[2]

TARGA is an acronym for ***T**ruevision **A**dvanced **R**aster **G**raphics **A**dapter*; **TGA** is an initialism for ***T**ruevision **G**raphics **A**dapter*.

TGA files commonly have the extension ".tga" on PC DOS/Windows systems and Mac OS X (older Macintosh systems use the "TPIC" type code). The format can store image data with 8, 15, 16, 24, or 32 bits of precision per pixel[3] – the maximum 24 bits of RGB and an extra 8-bit alpha channel.

EPS

EPS is a graphics file format saved in the Encapsulated PostScript (EPS) file format. It may contain 2D vector graphics, bitmap images, and text. EPS files also include an embedded preview image in bitmap format. EPS files are typically used to save artwork, such as logos and drawings, and as a standard means for transferring image data between different operating systems. The files are supported by several different drawing programs and vector graphic editing applications. You can convert EPS files to .PDF, .JPG, .PNG, and .TIFF files in programs such as Illustrator, Photoshop, and CorelDRAW.

END: There are more file formats than this available in the field of graphical imaging and even more that are employed in conjunction with audio/musical software, 3D software, etc. When employing any software program, it is paramount that you fully understand the ramifications of the file formats that you choosse for storing your data.