# JPEG

* Even though JPEGs are more complicated than BMPs, JPEGs have "signatures," patterns of bytes that can distinguish them from other file formats. Specifically, the first three bytes of JPEGs are
  + 0xff 0xd8 0xff
* The fourth byte, meanwhile, starts with 0xe meaning that the first 4 bits of the fourth byte are 1110
* To be fair, you might encounter these patterns on some disk purely by chance, so data recovery isn’t an exact science.
* digital cameras tend to store photographs contiguously on memory cards, whereby each photo is stored immediately after the previously taken photo.
* Accordingly, the start of a JPEG usually demarks the end of another.
* digital cameras often initialize cards with a **FAT file system** whose "**block size**" is 512 bytes (B).
  + The implication is that these cameras only write to those cards in units of 512 B.
  + A photo that’s 1 MB (i.e., 1,048,576 B) thus takes up 1048576 ÷ 512 = 2048 "**blocks**" on a memory card.
  + But so, does a photo that’s, say, one byte smaller (i.e., 1,048,575 B)! The wasted space on disk is called "**slack space."**
  + Forensic investigators often look at slack space for remnants of suspicious data.
  + Thanks to FAT, you can trust that JPEGs' signatures will be "**block-aligned**." That is, you need only look for those signatures in a block’s first four bytes.
  + brand-new memory cards have probably been "**zeroed**" (i.e., filled with 0s) by the manufacturer, in which case any slack space will be filled with 0s.