

## **In-Class Exercise 05 – Digital Image Hardware**

**Topics:** Numbering Systems, Digital Images

### **Reminders:**

- Please don't hesitate to call on the instructor if you need help. You are also welcome and encouraged to confer with your classmates if the instructor is busy helping somebody else.
- You are welcome to take breaks at your discretion while working on this assignment. However, you are not allowed to leave for the day until the class period has ended or you have completed the assignment and turned it in.

**Do not paraphrase from online sources. Use your own words! Be sure to observe the rules of spelling, grammar, capitalization, and punctuation in your write-up.**

**Instructions:**

1. Download the ICE05\_Template file and rename it to **LastnameFirstname\_ICE05**, then open it up in Word.
2. Go to Newegg's digital cameras section (<http://www.newegg.com/Digital-Cameras/Category/ID-354>) and find a camera of your choice that's currently available for purchase. Click on the Specifications tab, then answer the following questions about this camera:

**NOTE:** If you cannot find all of the specifications listed below, please go back and choose a different camera.

- a. What is the name of this camera? Be sure to include the entire name as advertised on NewEgg.
- b. What is the URL of the Newegg webpage with this camera's specifications?
- c. Is the camera a DSLR? Explain what DSLR means and why it's advantageous.
  - i. **HINT:** DSLR is a major selling point for cameras. If the camera is DSLR, it will be stated in an obvious way.
  - ii. Give your explanation of DSLR in terms of the lens and viewfinder.
- d. How many megapixels is this camera? (If your camera has multiple megapixel options, choose the largest one. If it offers both gross and effective megapixels, go with effective.)
- e. What is the resolution (pixel width and height) of the photos that the camera takes? (If your camera has multiple resolution options, choose the largest one.)
- f. Use the photo resolution to calculate the number of megapixels manually. Show your calculation, and ensure that your value is similar to the megapixel value from part d (the two values may or may not be identical, but they should be close). Be sure to use correct units! (**HINT:** See section 3.4.1 in the *Primer*.)
- g. Cameras commonly save images as JPEGs:
  - i. Does the camera use JPEG?
  - ii. Why do you think the camera uses JPEG over other image compression types such as PNG or GIF?
- h. Some cameras also save out photos as RAW files, another term for uncompressed bitmap images.
  - i. Does this camera have a RAW file option?
  - ii. Why might a camera want to save images as RAW files rather than compressed files? In other words, give one advantage to having an uncompressed image. (**HINT:** Compare uncompressed images to lossy compression.)

- i. Is the camera's sensor CCD or CMOS? Which option gives you a higher-quality image?
3. Let's say that you decide to print out an image taken using the camera in the previous step. Assume that you are not limited by paper size and that you set the ppi value to 150 pixels/inch:
  - a. What will the width and height of the printed image be in inches? Show your calculations. (**HINT:** See section 3.3 in the *Primer*.)
  - b. Why will the printed image look a little different from the digital image? (**HINT:** Think of color models.)
4. Save your file again and submit it on D2L.

**Criteria:**

Step	Points	Reason
1	5	Word file, correctly named, grammar
2a	5	Camera name
2b	5	Camera URL
2c	10	Is DSLR? Explain what DSLR means.
2d	10	How many MP (largest one)?
2e	10	Resolution (largest one)?
2f	10	MP calculation; similar to 2d
2g	10	Compression formats? Why these formats?
2h	10	RAW option? Advantage of RAW files?
2i	5	CCD or CMOS and the difference between them
3a	10	Calculations for dimensions of printed image
3b	10	Why will printed image look different from digital?