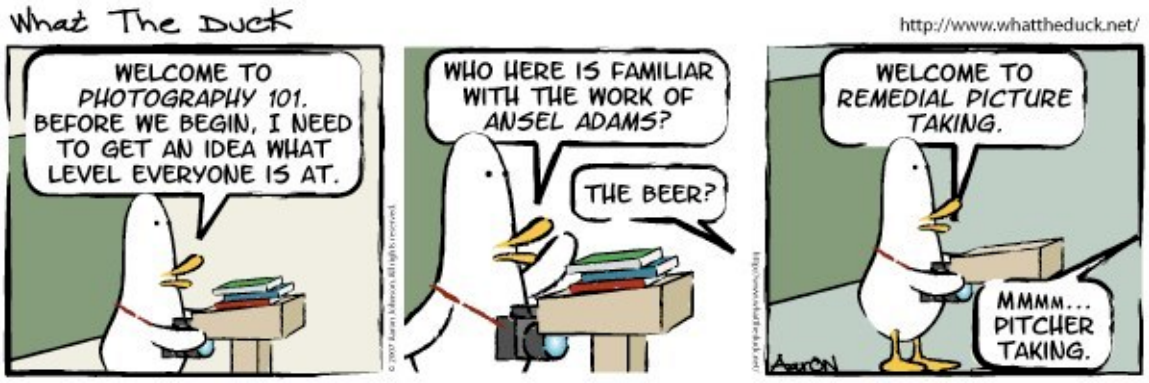
Keep an I[SO] Out

Assignment #1. Due 5:30PM on Monday, September 28, 2009.



Part 0. Setup! (10 points)

1. In order to submit portions of your assignments, share your photos, and participate in an e7-specific online discussion board discussing photography, you'll need to get a Flickr account (if you don't already have one) and join the Computer Science e7 Flickr group! Luckily, all of this can be done in three easy steps. Read and follow the instructions found on the setup page below to get started:

   `http://cse7.org/setup`

   Be sure to follow the steps on that page before continuing with the assignment, as some of the subsequent questions require this is done before you are able to submit your photos!

Part I. Pick Your Favorite! (20 points)

2. (14 points) A photography course would be remiss to not mention Ansel Adams. Best known for his photographs of the western United States, he is often credited as one of the original American masters of photography. He has written two of the recommended (but not required!) textbooks for this course, *The Camera* and *The Negative,* that remain relevant today for their exploration of exposure and a camera's construction. Even if you do not recognize his name, you have probably seen some of his work. Take a look at this gallery of photos:

   `http://www.anseladams.com/ansel-adams-photography.html`

   His works are highly regarded masterpieces of composition and expert execution of the technical aspects of photography, but the subject matter does not interest everyone. Although great, some people favor other genres of photographs.

   It is this that we would like to find out. What is your favorite photograph? Please show it to us! It need not be one by Ansel Adams; it may be a photograph you have taken, one your friends have taken, or just one you have randomly found while procrastinating on the Internet! If you don't have a favorite, you may want to try looking around on Flickr.

From the Flickr home page just search for some keywords that interest you (cars? boats? planes? or even trains?) and find one! It should ideally be a photo that you find truly striking and one that is not so small that you miss out on important details.

When you submit your photo, be sure to answer the following questions as well:

- Whose photo is this? Be as specific as you can. If you found the photo on a website, provide a link to it.

- List two (or more) different things that you find interesting about the photograph. Is it the subject? Is it how the photo is taken? Is it some technical detail or an effect you would like to replicate in your own photos? Again, be as specific as possible.

- Take a harder look at the photograph you chose. What could be done better? Few photos are absolutely perfect. Is it slightly blurry? Are some details missing or difficult to see that you wished were more apparent? Could the timing of the photo have been better? Is anything out of place or awkward? This is your time to critique!

Before this assignments' due date, post your chosen photo to the e7 Flickr Group discussion board:

- Post as a reply to the "**Keep an I[SO] Out: Pick your favorite!**" topic in the e7 Flickr Group. A link will be provided on the course website:

  `http://cse7.org/assignments`

- Be sure you post in the correct thread so you get full points!

- To receive full points you must be sure you answer all of the above questions and put your chosen photo in the same forum post.

- If your image is on the Internet (and not on Flickr), feel free to link to it in your post. If the photo is on Flickr, you can have it show up in your post by putting its URL in square brackets, like so:

  `[http://www.flickr.com/photos/example/2910192942/]`

- Be mindful of image ownership issues. Please don't upload a photo that isn't yours to your Flickr photostream to add it to the post. Better would be to link to it from it's original location.

- There is no need to post your name or other identifying information when you post your submission. We will know it is you by your Flickr username!

3. (6 points) Now that you have found and described your favorite image to us and your fellow e7-ites, give them your support by responding to at least **two** separate photographs. Feel free to constructively critique the photo, describe what you like about the photo, or otherwise comment on the thread. Any relevant response is fine, though the intent is for you to begin thinking about photos critically. It will be other photographs for now, but soon you will need to critique your own to isolate your best photographs.

Part II. Pick Your Brain! (30 points)

Unlike Part I, do not submit your answers for this part to Flickr. Type your answers for the following questions in a word processor; we will accept Word Documents (**.doc**, **.docx**), PDF documents (**.pdf**), or plaintext files (**.txt, .rtf**). Before the due date, attach the file to an email and send it to us at this address:

pset@cse7.org

4. (12 points) Name and explain the four factors that affect exposure. What is the relationship between all four factors and exposure? Be sure to explain the complex relationships among each; how does each affect exposure when the factor is increased and decreased, assuming other factors remain constant? How must each change (if possible) to compensate for other factors? How does each impact the photo's appearance when the factor is increased and decreased, assuming the exposure is able to remain the same? Reference photographs you took for Question 12 (see below) to bolster your response on how a change in each factor alters a photo's appearance. What other consequences, if any, must the photographer acknowledge when modifying each factor? You may find creating a table helpful in answering this question.

5. (4 points) Give two reasons why it is a good idea to shrink the size of a photograph when it is to be sent via email or posted to a website. What is a reasonable resolution to export your photograph when sending one via email?

6. (4 points) Suppose there is a properly-exposed photograph outdoors using the Sunny 16 rule. Another properly exposed photograph is taken indoors at ISO 800, f/2.8, and at 1/50 of a second. How many stops darker is it indoors than outdoors?

7. (4 points) Some conspiracy theorists claim that the moon landings were faked because, among other things, there are no stars in the backgrounds of photographs allegedly taken on the moon. Their explanation is that the thinner atmosphere on the moon would make stars visible in photographs. Using your knowledge of exposure, support or refute this evidence in an explanation no longer than a few sentences long. Can this evidence be reasonably used as proof in the theory that the moon landings were faked?

8. (3 points) Calculate the minimum and maximum F-number of the human eye. Assume a focal length of 22mm, a minimum diameter of 2mm, and a maximum diameter of 7mm. Be sure to show all work for full credit.

9. (3 points) An SLR has a mirror that reflects light coming from the lens into the viewfinder so that the photographer can see a preview of the photo before a photo is taken. In order for a camera to take a photo, though, it must move the mirror up before opening the shutter to expose the sensor. If the mirror does a good enough job of preventing light from reaching the sensor, why does an SLR also have a mechanical shutter?

Part III. Pick Your Best! (40 points)

There are some general guidelines that apply for every photograph that you submit for this assignment:

- Photographs must be completely **unmodified and unedited**. Do not use any software to retouch or modify the image in any way; submissions should be straight from the camera. If necessary, because of Flickr upload restrictions, you may resize the photo but the EXIF data must remain wholly intact. You may rotate a photo after it has been uploaded to Flickr, if you wish.

- All submissions should be **original photos** taken by you for the purposes of this problem set.

- Be sure to submit the photos in the **JPEG** file format; this should be the default for many, if not all, cameras. If you prefer taking photos in RAW format, note your camera may have a "RAW+JPEG" setting where it will save a photo in both formats.

- To submit these photos by the due date, **upload** them to your Flickr photostream, give them a tag of **KeepAnISOOut** (notice that there are no spaces!) and, finally, **add** them to the e7 Group pool. If you see your photo in the group pool and it has the appropriate tag then you have successfully submitted it! We use tags as a way to identify photos as being for a specific problem set. Be sure not to remove the image from the group or delete it from Flickr at any time or it may not be graded. Take a look at the following links if you need help uploading , tagging, or adding photos to a pool:

  `http://www.flickr.com/help/photos/#16`
  `http://www.flickr.com/help/tags`
  `http://www.flickr.com/help/groups/#57`

10. (8 points) Take at least, and submit no more and no less than, **8 photographs**. Each photograph should be of unique subjects (in other words, don't submit 8 photos of your cat!) and taken specifically for this problem set. The idea is for you to take photographs that you typically take with the camera you typically use.

    Be sure at least 3 of the photographs you submit are of subjects or locations you can re-shoot in the future. We will ask you in a future assignment to revisit some of these photographs and attempt to retake them (after some modification and re-interpretation) so that you can observe how far your photographic skill has improved over the course of the semester!

    When submitting these photos, give them all an additional tag of **TypicalButUnique** (note that there are no spaces). Be sure that this tag is in addition to, and not replacement for, the KeepAnISOOut tag above.

11. (32 points) Take a series of photographs to accompany your answer for Question 4. The idea is that you will prove your answers about how each factor affects the appearance of the photograph while keeping exposure roughly the same. You will therefore be forced to change other factors to compensate. Here are some guidelines:

    - Submit **3 photographs** per exposure factor to demonstrate how that factor affects the photograph. You should submit exactly 12 photographs for this question.

    - You should be sure that the **effects are clear**: if you are demonstrating the effects of shutter speed, showing one photo taken at 1/500s and another at 1/1000s is unlikely to adequately show the difference.

- You must **isolate the effect** as best as you can. Even though you will have to modify other settings to keep your photos properly exposed you should minimize the effects of those settings as much as possible. When illustrating the effects of F-number, for example, you must keep motion blur at a minimum. Some overlap is unavoidable; do your best to isolate the factor's effect.

- Your photos should be **perfectly exposed**. Remember, we are not asking you to show how each factor affects *exposure*, we want to make sure you understand how each factor affects the *appearance* of the photograph while keeping exposure relatively constant. Your subject should not have any loss of detail in shadows or the bright regions. Under-exposing or over-exposing the background is sometimes unavoidable but it should not be distracting.

- Only use the **Manual Mode**. You will need (either by trial-and-error, calculation, or even good guessing) to set your own exposure values for all exposure settings. Various modes such as aperture priority, shutter speed priority, or any of the “basic” modes do not count as manual modes as the camera is still setting exposure values based on its own calculations. If your camera’s manual mode does not let you override all three values, you will need to borrow one of the course’s from Church Street lab. You do not need to manually focus; you may use autofocus.

- After you've uploaded the photo, you should let us know the exposure effect you are demonstrating in the description of the photo.

- When submitting these photos, give them all an additional tag of **ExposureEffects** (note that there are no spaces). Be sure that this tag is in addition to, and not replacement for, the KeepAnISOOut tag above.