Announcements

- **Final exam Saturday 5/12 from 4:00PM to 6:00PM**
  - **See class webpage for location**
  - **BRING PHOTO ID**

- **Review on Wednesday**

Top 10 Ways to Become a Better Programmer

Programming Tips

10. Be confident!

- **Everyone struggles at first**
- **Anxiety is *normal* for beginners**
- **A large project can seem overwhelming… Break it into steps**
- **It takes practice before it becomes second nature**
- **Be patient!**

Programming Tips

9. **Don't Procrastinate**
   - **It is impossible to know how long something will take!**
   - **It doesn't matter how good you are**

Programming Tips

8. KEEP BACKUPS!!!!!

Programming Tips

7. **Plan before you begin!**
   - **Time spent planning more than pays for itself**
   - **Without a plan you are likely to reach many "dead-ends"**
   - **How can you break the problem into manageable pieces?**
   - **Write down some pseudocode and/or draw some diagrams (See next two slides about pseudocode…)**

"PseudoCode"

- **Pseudocode – halfway between English and Code**
  - **–Mostly English words**
  - **–Variables frequently used**
  - **–Structured like a program**
  - **–Ignores formal language rules**
  - **–Does not depend on a particular programming language**

- **Useful for jotting down the flow of a program without having to worry about all the technical details of formal programming**

Example: I would like to write a program that sends an email message. The message can be sent to just one recipient or everyone in the user's address book. (Next slide, please…)

PseudoCode Example

```
prompt:  “Enter message”
input message
prompt: “Send to entire address book?”
input response
if response is no
    prompt:  “Enter recipient”
    input recipient
    send messsage to recipient
otherwise
    for each address, x, in the address book
        send message to x
```

Programming Tips

6. **Don't make assumptions**
   - **If you don't know how something works, look it up!**
   - **Never assume the user will do what is "expected"**
   - **Never just assume that you did the *easy* part correctly – we all make dumb mistakes sometimes!**

Programming Tips

5. **Learn to debug your code**
   - **Be systematic**
   - **Put in trace statements**
   - **Try to think like a machine!**

Programming Tips

4. **Use proper style**
   - **Variable names**
   - **Braces**
   - **Indentation**
   - **Comments**

   Why is this important?
   - **In case someone looks at your code**
   - **For your own purposes… Write code like your memory will be erased tomorrow!**

Programming Tips

3. **Learn by experimentation!**
   - **If you're not sure how something works, try it!**
   - **If you see a technique you're not familiar with try it!**
   - **You will learn best by thinking about things in different ways**

Programming Tips

2. Programming slowly is faster!

Two kinds of programming:

Preventative: Carefully implement each statement, thinking about what you are doing and considering all possible scenarios

Corrective: Quickly implementing things, planning to later go back and correct problems

Programming Tips

1. **Write code incrementally.**
   - **Write a tiny piece of code**
   - **Test it thoroughly**
   - **Test it some more**
   - **Test it again**
   - **When it is perfect, move on to the next tiny piece of code**

Color Theory

There are 16,777,216 colors to choose from!

How many should you use?

- **Too many is disruptive/confusing**
- **Too few could be boring**

Color Theory

Emotional Responses:

Red – strength, passion, energy, excitement

Orange – similar to red, but less aggressive (more "cheerful")

Yellow – refreshment, energy

Green – nature, health, well-being

Blue – calm, peace, stability, trust

Purple – sophistication, spirituality

White – purity, trust

Black – depth, power, steadiness

Cool/Warm

Cool Colors: Green, Blue, Violet

- **Appear distant**
- **Great for backgrounds**

Warm Colors: Red, orange, yellow

- **Appear closer-up**
- **Great for menus**

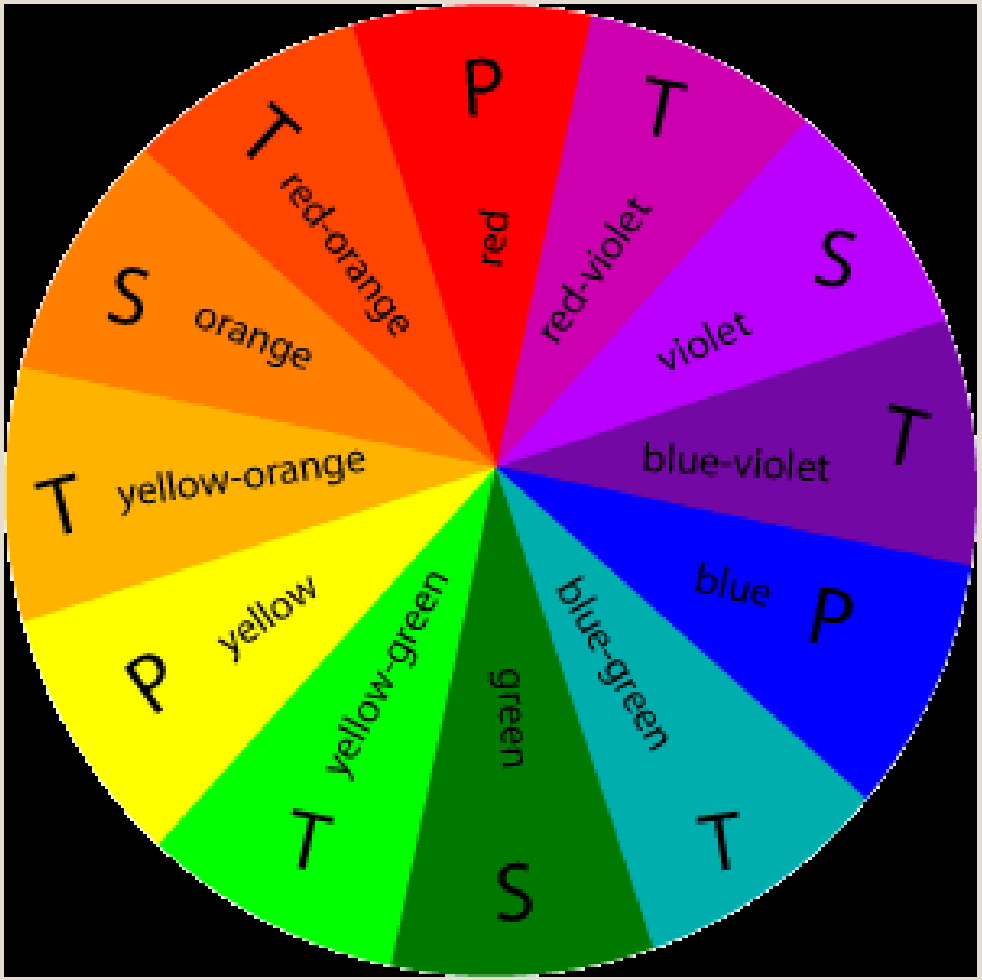
Standard Color Wheel

(P) Primary

(S) Secondary

(T) Tertiary

…



Color Wheel Definitions

Complimentary Colors – opposite on wheel

- **Highest contrasts**

Analogous Colors – close to each other

- **Lowest contrast**

Harmonic colors – equally spaced on wheel

- **“Harmonic dyad” (complimentary colors)**
- **“Harmonic triad”**
- **Appealing to the eye**

Examples

Some select pages with great color schemes:

http://inspiredm.com/colour-schemes/

Some tools for creating color schemes:

http://paletton.com/

Course Evaluations

- **If you haven't done a course evaluation, please do it now:**
- **https://courseevalum.umd.edu/**