Last Time

- We
  - Covered abbreviated assignment statements
  - Learned about the increment and decrement operators
  - Started looking at the for repetition structure
  - Top-down, stepwise refinement

- Today we will
  - Cover more examples of the for loop
  - Introduce the switch selection structure
  - Learn about ASCII values

Switch Statements

- Another form of selection statement
- Similar to if's
- Useful for lots of alternatives

Example

```
switch (watts)
{
    case 25:
        life = 2500;
        break;
    case 40:
        life = 1000;
        break;
    case 75:
        life = 750;
        break;
    default:
        life = 0;
}
```

Example

```
switch (musical_note)
{
    case 'c':
        cout << "do" << endl;
        break;
    case 'd':
        cout << "re" << endl;
        break;
    case 'e':
        cout << "mi" << endl;
        break;
    case 'f':
        cout << "fa" << endl;
        break;
    case 'g':
        cout << "sol" << endl;
        break;
    case 'a':
        cout << "la" << endl;
        break;
    case 'b':
        cout << "ti" << endl;
        break;
    default:
        cout << "An invalid note was read.";
}
```
Important!

- Selector must be a constant integral expression
- Each possible value is a separate case
- break stops statements for case, otherwise continue with statements for next case

Example

```cpp
switch (color)
{
    case 'R': case 'r':
        cout << "red" << endl;
    case 'B': case 'b':
        cout << "blue" << endl;
    case 'Y': case 'y':
        cout << "yellow" << endl;
}
```

10.1: What happens when color is 'r'? 'B'? 'Y'? 

Example

```cpp
switch (x > y)
{
    case 1:
        cout << "x greater" << endl;
        break;
    case 0:
        cout << "y greater or equal" << endl;
        break;
}
```

10.2: Write as if statement

Questions

- 10.3: Can you write any switch statement as an if? Why or why not?
- 10.4: Can you write any if statement as a switch? Why or why not?
Example

```c
Example
case 'F':        // grade was uppercase F
    ++fCount;     // increment fCount
    break;        // exit switch
    case 'f':        // or lowercase f
        ++fCount;
        break;        // exit switch
    case '\n':       // ignore newlines,
        break;        // exit switch
    case '\t':       // and spaces in input
        break;        // exit switch
    default:         // catch all other characters
        cout << "Incorrect letter grade entered."
        << " Enter a new grade. " << endl;
        break;        // optional
} // end switch
} // end while
```

`cin.get()`

- Used to read one character from the keyboard at a time
- Also reads new lines, spaces, and tabs as a character
  - `\n`: new line
  - `\t`: tab
  - ` `: space

ASCII Values

- All characters have integer values called ASCII values
  - `'a'`: 97
  - `'b'`: 98
  - `'z'`: 122
  - `'A'`: 65
  - `'B'`: 66
  - `'Z'`: 90

ASCII

- ASCII: American Standard Code for Information Interchange
- Appendix B lists the ASCII character set

EOF

- An integer constant defined in the iostream library
- On Unix it is:
  - <ctrl-d>
- On Windows it is:
  - <ctrl-shift-Z> That is, press the control key and the shift key simultaneously and then the z key. You will see a ^Z on the screen which stands for the EOF character.

Change to switch

```c
Change to switch
if (speed > 35)
    fee = 20.00;
else if (speed > 50)
    fee = 40.00;
else if (speed > 75)
    fee = 60.00;
```
Examples

- 10.5: Write an if statement that prints out the level of schooling. (0, none; 1 through 6, elementary; 7 through 8, middle school; 9 through 12, high school; > 12, college)

- 10.6: Write a switch statement to do the same

Summary

- In today’s lecture we covered
  - More examples on the for repetition structures
  - switch selection structure
  - ASCII values
  - cin.get()

- Readings
  - P. 113 - 119 switch selection structure