ECE/CS 151
Intro to Programming I

Odds/Ends & Conditional Execution
Chap. 2.11 - 3.4

Assignment #1

• Due tonight
• Cute PDF Writer
• Map a network drive (or SCP/SFTP client)
• Be specific w/ data type for variables
  – int, short, long, unsigned
• Match printf placeholder w/ data type
  – %d, %ld, %u, %lu, %o, %x, %lo, %lx

Odds and Ends

• What is the difference b/w double and float?
  scanf("%lf", &float_num);
  scanf("%lf", &double_num);
  printf("%f\n", double_num);
  p. 244 & 246
• pow() function
  – Always include <math.h>
  – If you pass a variable to function, then –lm
New Operators for Expressions

- What if you have the statement `var = var + 1;`
  - `var += 1; /*Add operand on right to var*/`
  - `var++; /*Increment var by one*/`
- What if you have the statement `var = var - 5;`
  - `OR var = var + var;`
  - `var -= 5;`
  - `var += var;`

Decisions in Life

- What is a decision?
- When do we make decisions?
- How do we make decisions?
  - If it is sunny today
    - then I’ll go to the beach and fly a kite
  - Else if it is raining today
    - then I’ll stay inside and read a book
  - Else if it is snowing
    - then I’ll go to the mountains to ski

Decisions within Decisions

- What happens if there is no wind at the beach?
- How does this change our decisions?
  - If it is sunny today
    - then I’ll go to the beach
      - if it is windy at the beach
        - then I’ll fly a kite
      - if it is not windy at the beach
        - then I’ll walk on the shore
Flow chart for decisions

- Is it sunny? Yes → Go to beach No → Is it raining?
  - Yes → Read book
  - No → Go outside
- Is it windy? Yes → Fly kite
  - No → Walk on beach

Decisions in our programs

- Use an if/else
  if (<expression>) {
    <statement>;
    ...
    <statement>;
  }
else {
  <statement>;
  ...
}

What is the <expression>?

Could be a relational expression:
<expression> <relational op> <expression>

- Relational Ops
  == - equal to
  != - not equal to
  < - less than
  > - greater than
  <= - less than or equal to
  >= - greater than or equal to
Examples

- if(2 + 1)
- if(2 - 4)
- if(2 - 2)
- if(4 == 4)
- if((2+1) == 4)
- if(4.1 != 4)
- if(3 <= 4)
- if(4 >= 4)
- if(3.5 > 4)
- if(4 < 4)
- if(3+2*2 > 9)
- if((3+2)*2 > 9)

C If/Else Syntax...

```c
if (x > y) {
    printf("X is greater than Y\n");
} else {
    printf("X is less than Y\n");
} // When does this logic fail?
```

C If/Else...

```c
if (x > y) {
    printf("X is greater than Y\n");
} else if (x < y) {
    printf("X is less than Y\n");
} else {
    printf("X is equal to Y\n");
}
```
What are the curly braces for?

```c
if ( x > y )
    printf("X is greater than Y\n");
else if ( x < y )
    printf("X is less than Y\n");
else
    printf("X is equal to Y\n");
```

What if we are testing for ==?

```c
if ( x == 0 )
    printf("X is zero\n");
else if ( x == 1 )
    printf("X is one\n");
else if ( x == 2 )
    printf("X is two\n");
else
    printf("You have entered an invalid number!!!\n");
```

We can use a switch...

```c
switch( <expression> ) {
    case <const-expr>:
        <statement>;
        ... 
    case <const-expr>:
        <statement>;
        ... 
    default:
        <statement>;
        ...
}
```
C Switch Example

```c
switch( x ) {
    case 0:
        printf("X is zero\n");
        break;
    case 1:
        printf("X is one\n");
        break;
    case 2:
        printf("X is two\n");
        break;
    default:
        printf("You have entered an invalid number!!!\n");
}
```

Quiz #2

- What if we didn’t have a break in the case of a switch statement?
- How could you write an if/else to match not having a break in a case?
- What do you think this does in C?
  `<expression1> ? <expression2> : <expression3>`