

EECS 10: COMP METHODS IN ECE Discussion 3

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Course Updates

- Solutions to Assignment 1 was posted on the course website.
- Assignment 2 was posted on the course website.
 - Due date: Monday July 6 at 11:00pm
- First mid-term on Thursday
 - Be prepared!

Discussion Outline

- Concept Review
 - Comparison of values
 - Relational operators
 - Logical operators
 - Conditional operators
 - Control flows in C
 - Conditional statements
 - Repetition statements
- Assignment Discussion
 - Problem 1 of Assignment 2

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Comparison of Values

- Relational Operators
 - Direct comparison of two values
 - Defined for all basic types (e.g., integer, floating point)
 - Return value: True or False
- Logical Operators
 - Operations on Boolean values
- Conditional Operators
 - Conditional evaluation of values in expressions
 - Example:
result = (condition) ? true-value : false-value

| x | y | !x | x && y | x y |
|---|---|----|--------|--------|
| 0 | 0 | 1 | 0 | 0 |
| 0 | 1 | 1 | 0 | 1 |
| 1 | 0 | 0 | 0 | 1 |
| 1 | 1 | 0 | 1 | 1 |

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Evaluate the Following Expressions

- `5 < 6` ✓ 1
- `float f1 = 6.0, f2 = 6e1`
 - `f1 > f2` ✓ 0
 - `f1 > -f2` ✓ 1
- `int i = 10`
 - `(i < 20) && (i > 5)` ✓ 1
 - `(i < 5) || (i > 10)` ✓ 0
 - `!((i < 1) || (i > 9))` ✓ 0
- `int d = -3`
 - `d = (4 < 5) ? (43) : (4 + 8)` ✓ d = 43
 - `d = (d == -1-2) ? (-d) : (d)` ✓ d = 43
 - `d = (d < 0) ? (-d) : d` ✓ d = 43

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Advanced Operators

- Augmented Assignment Operators
 - `+=, -=, *=, /=, %=, <<=, >>=, |=, &=`
 - `x += 3` equals to `x = x + 3`
- Increment and Decrement Operators
 - Post-increment `count++`
 - Pre-increment `++count`
 - Post-decrement `count--`
 - Pre-decrement `--count`

```
int a = 3;
b = a++; // a is 4, b is 3
c = ++a; // a is 5, c is 5
d = a--; // a is 4, d is 5
e = --a; // a is 3, e is 3
```

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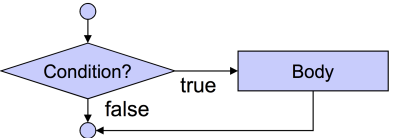
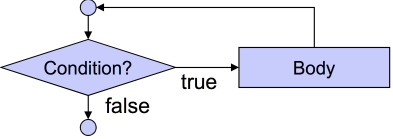
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Control Flows in C

- Conditional Statements


```
if (condition)
{
    body;
}
```
- Repetition Statements


```
while (condition)
{
    body;
}
```
- Condition
 - Expression evaluation
 - 1 (True) or 0 (False)

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Control Flows in C

- A simple example – vending machines
 - All drinks are at the same price (USD 2.5)
 - 5 kinds of drink to choose from (Coke, Sprite, ...)
 - Use `if` and `while` statements to program a vending machine

Wait for Enough Money

↓

User Chooses a Drink

```
while (n < 2.5)
{
    printf("insert more money...\n");
    scanf("%f", &input);
    n += input;
}
```

```
scanf("%d", &type);
if (type == 0)
    printf("User chooses Coke.\n");
if (type == 1)
    printf("User chooses Sprite.\n");
```

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Problem 1 of Assignment 2

- Problem 1 of Assignment 2
 - Before you implement your work, take a look at lecture 2.2, page 30-32.
 - Read the assignment handout carefully.
- Calculate the approximation of $\tan(x)$
 - x is radian
 - angle in degree = angle in radian $\times 180^\circ/\pi$
 - Approximation 1, through the Taylor expansion of the tangent function
 - Approximation 2, $\tan(x) = \sin(x) / \cos(x)$
 - Both are required for Problem 1 of Assignment 2

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Problem 1 of Assignment 2

- Bonus Part: Boundary Checking
 - Set boundary value checking for input radian
 - If the input radian is within a certain range...
 - If the input radian is out of a certain range ...
 - Try to implement this bonus part, and it is a good exercise for the second part of the assignment
- Describe your work with the following detail in the text file
 - What type of variable you used in the program? Why?
 - Any difficulty you faced in this assignment
 - How did you do the boundary checking for the input radian value (if you want to implement the bonus part).
- Name your files as **tan.c**, **tan.txt** and **tan.script**

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