06 - Making Decisions - Part 2

Dr. Robert Lowe

Division of Mathematics and Computer Science
Maryville College

Maryville COLLEGE

Outline

Maryville COLLEGE

Git Work Sessions

- Always begin each work session with:
  `git pull`
- Frequently commit!
  `git add -A`
  `git commit -a`
- When you do a commit, git will open nano for you to edit your messages. You can avoid opening the editor by using the `-m` option to specify a log message directly on the command line:
  `git commit -a -m 'log message here'`
- Always make sure to commit and then push all changes at the end of a work session.
  `git push`

Maryville COLLEGE

Programming Affirmations

- Do not be afraid to fail.
- Fail quickly, fail often.
- You are not the one who is behind. Pretty much everyone in this room feels like they are the only one who hasn't caught on.
- You are doing far better than you realize. Learning to code is not easy. That you are still hear means you can do this!
- Programming is a repeated effort. It is full of false starts and scrapped efforts.
- If you are stuck, more code is rarely the answer. Instead go back to your design notes and try to find what you missed.
- Seeing a program through from beginning to end without backtracking and reworking almost never happens.

Maryville COLLEGE

Working With the Compiler

- The compiler generates two kinds of messages (warnings and errors).
- A **warning** is something that can indicate code that is suspected to be faulty.
- When the compiler issues a warning, it still compiles the program.
- An **error** is something that means the compiler cannot follow the meaning of the code. (Malformed syntax, invalid keywords, wrong types, etc.)
- When an error occurs, the compiler does not generate code.

Maryville COLLEGE

Locating Errors

```
even-odd.cpp: In function 'int main()':
even-odd.cpp:19:5: error: expected ';' before '}' t
     } else {
     ^
```

- Compiler error messages will indicate where the error/warning was located.
- The format is `filename`:*line*:*column*
- The above error is from file `even-odd.cpp` line 19 column 5
- The location is where the problem was noticed. Not necessarily where it actually needs to be fixed.
- Compilers do nothing to detect logic errors!

Maryville COLLEGE

Challenge: Fix `proportion.cpp`

1. Make the directory `labs/week4`
2. Copy the file `examples/06-Decisions/proportion.cpp` to your `labs/week4` directory.
3. Try to compile `proportion.cpp`.
4. Use the compiler error messages to locate and fix the compiler errors.
5. Test the program. Fix any logic errors you may find.

UNIX Tips and Shortcuts

- Typing part of a filename followed by the `tab` key will complete the filename for you.
- You can scroll through your command history by pressing up and down on the cursor keys.
- Repeat a selected command by pressing `enter`.
- You can repeat a command by pattern matching using `!`. For example, to repeat your last compiler line:

  `!g++`

  or

  `!g`
- Try using these as you use the command line. More speed tips will follow.

Maryville COLLEGE

Testing for a Range of Values

- In your `examples/06-Decisions` folder, you will find `range.cpp`
- Run and test this program. Does it work?
- What is going on here?

```
int main()
{
    int num;

    //get a number
    cout << "Enter a number" << endl;
    cin >> num;

    //test to see if it is between 1 and 5
    if(1 <= num <= 5) {
        cout << "The number is between 1 and 5" << endl;
    } else {
        cout << "The number is not between 1 and 5" << endl;
    }
}
```

Combinational Operators

and

a	b	a and b
F	F	F
F	T	F
T	F	F
T	T	T

or

a	b	a or b
F	F	F
F	T	T
T	F	T
T	T	T

not

a	not a
F	T
T	F

Operator Precedence (Thus Far)

Operator	Description	Associativity
`not`, `!`	Logical Not	Left-to-Right
`a*b`, `a/b`, `a%b`	Multiply, Divide, Modulus	Left-to-Right
`a+b`, `a-b`	Addition and Subtraction	Left-to-Right
« , »	Insertion and Extraction	Left-to-Right
`<`, `<=` `>`, `>=`	Relational Operators	Left-to-Right
`==`, `!=`	Equality Operators	Left-to-Right
`and`, `&&`	Logical And	Left-to-Right
`or`, `||`	Logical Or	Left-to-Right

`=`,
`+=`, `-=`
`*=`, `/=`
`%=`
	Assignment and Assignment	Right-to-Left

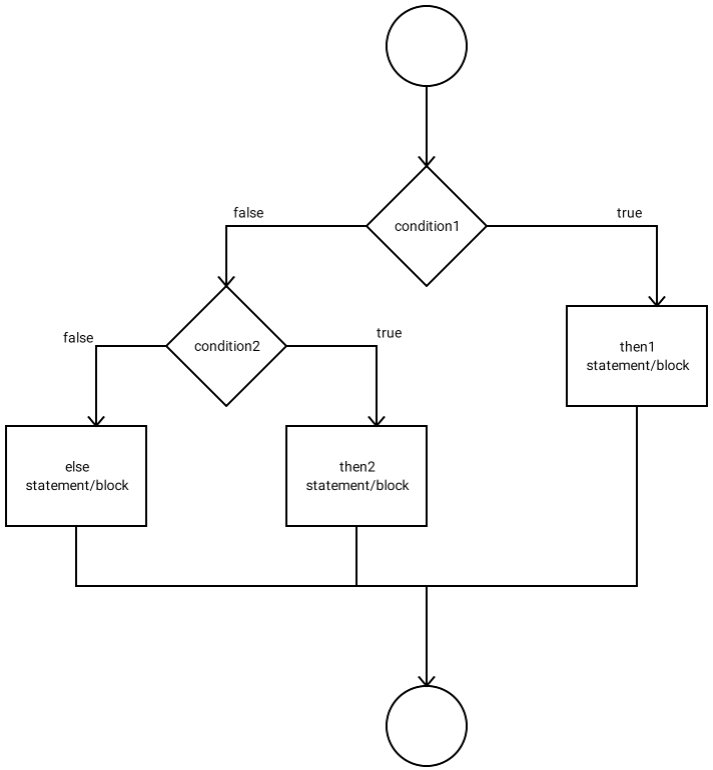
Example: Range Validate

```
num >= 1 and num <= 5
```

- The above expression is the correct way to detect over a range.
- Copy `range.cpp` to your `labs/week4` folder and correct it.
- Make sure the program works!

Multi-Way Branching: If-Then-Else-If

```
if( condition )
      then statement/block
else if( condition )
      then statement/block
else
      else statement/block
```



- The first then *statement/block* with a true condition executes.
- If no matches are found, the (optional) *else statement/block* executes.

Example Snippet: Rock, Paper Scissors

```
if(player == 1) {
  cout << "Rock" << endl;
} else if(player == 2) {
  cout << "Paper" << endl;
} else if(player ==3) {
  cout << "Scissors" << endl;
}
```

Challenge: The Stock Menu

```
Stock Portfolio Management System
        Please Make a Selection
1 -- Buy a Stock
2 -- Sell a Stock
3 -- Report Current Holdings
4 -- Report Gains and Losses
5 -- Remove a Current Holding
6 -- Done!  (quit)

Choice?
```

1. Copy your `stock.cpp` file from your `labs/week2` directory to your `labs/week4` directory.
2. Add logic so that it prints your menu selection. For instance, if you enter "1", your program should reply with "`Buy a Stock`"
3. Add logic so that if you select anything other than 1 through 6, your program displays an error message.