Module 13: Multi-way branching

Intro to Computer Science 1 - C++

Professor Scott Frees

Textbook

Else and Else-if are covered in Sections 3.4 and 3.5 in the textbook

Branching

- Often, we want to do one of two different things, based on a condition
  - Ask the user to enter the sum of randomly generated numbers:
  - **If** correct, congratulate them
  - **Otherwise (else)**, display the correct answer

```
if (  input == correctAnswer ) {
  cout << "Good Job!" << endl;
}
else {
  cout << "Sorry, correct answer is " << correctAnswer <<
endl;
}
```

If / Else if / Else blocks

We can string together multiple if statements with the *else* command

```
if (  <boolean expression> ) {
  …
}
else if ( <boolean expression> ) {

}
else {
  ….
}
```

you can have several else if blocks

Programming Example 13

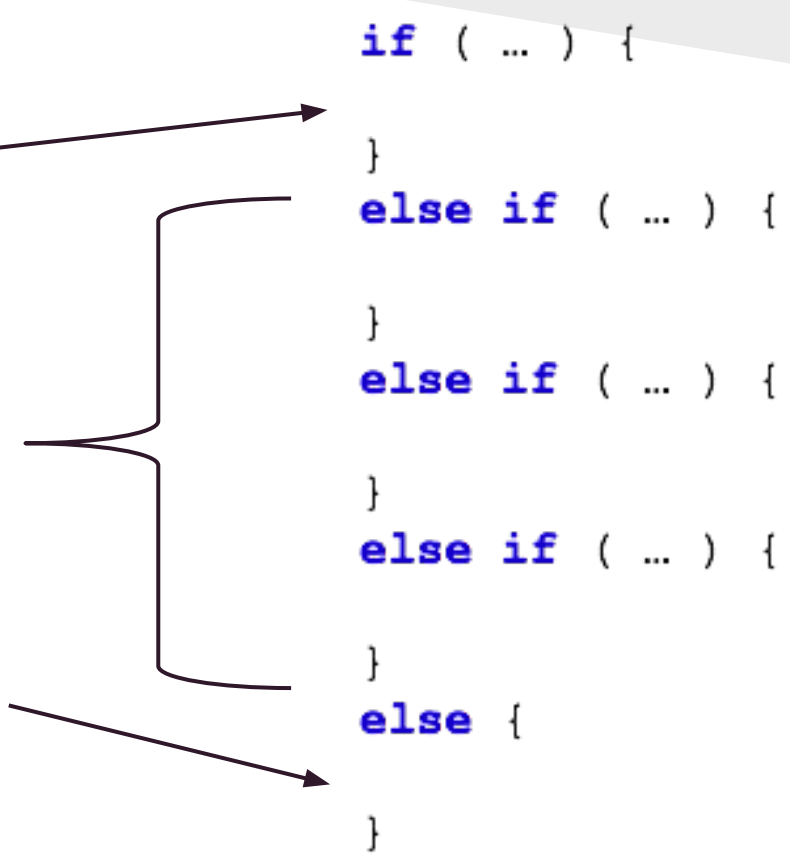
Allow the user to enter a grade (0-100)

- Assign a letter grade using if/else if statements

Note, without if/else (just if) we'd have a very difficult time doing this… unless we use logical operators (next module)

If / Else if / Else control flow

- When using else if:
  - The first test is always tested
  - The remaining else if tests are only tested if none of the previous succeeded
  - The else clause only executes if none of the conditions have been true



Common errors

```
if ( … ) {

}
else if ( … ) {

}
else {

}
else if ( … ) {

}
else {

}
```

```
if ( … ) {

}
else ( … ) {

}
else if ( … ) {

}
else if ( … ) {

}
else {

}
```

```
if ( … ) {

}
else if ( … ) {

}
else if ( … ) {

}
if ( … ) {

}
else {

}
```

Common errors

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else ( … ) {

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else if ( … ) {

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else if ( … ) {

}
else {

}
```

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if ( … ) {

}
else if ( … ) {

}
else if ( … ) {

}
if ( … ) {

}
else {

}
```

Common errors

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if ( … ) {

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else if ( … ) {

}
else {

}
else if ( … ) {

}
else {

}
```

```
if ( … ) {

}
else ( … ) {

}
else if ( … ) {

}
else if ( … ) {

}
else {

}
```

```
if ( … ) {

}
else if ( … ) {

}
else if ( … ) {

}
if ( … ) {

}
else {

}
```

Common errors

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if ( … ) {

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else if ( … ) {

}
else {

}
else if ( … ) {

}
else {

}
```

```
if ( … ) {

}
else ( … ) {

}
else if ( … ) {

}
else if ( … ) {

}
else {

}
```

```
if ( … ) {

}
else if ( … ) {

}
else if ( … ) {

}
if ( … ) {

}
else {

}
```

Indentation and Scope

```
if (  <boolean expression> ) {
     if ( <boolean expression> ) {
               ...
     }
     else {
               ...
     }
}
else {
     if ( <boolean expression> ) {
               ...
     }
}
```

Notice the growing value of indentation….

Watch where you declare variables!

You MUST learn to keep your code well formatted.