

Class 04

Decisions, Relational Operators, If, If-Else, Code Blocks

Truth

- In computer programming, truth is black and white
 - 1 or 0
 - true or false
- Any non-zero value can be interpreted as true, while 0 is interpreted as false
- An expression that can be evaluated as true or false involve comparing two things

Relational Operators

Table 2.1 Relational Operators

Operator	Meaning	Sample Expression	Evaluates To
==	equal to	5 == 5	true
		5 == 8	false
!=	not equal to	5 != 8	true
		5 != 5	false
>	greater than	8 > 5	true
		5 > 8	false
<	less than	5 < 8	true
		8 < 5	false
>=	greater than or equal to	8 >= 5	true
		5 >= 8	false
<=	less than or equal to	5 <= 8	true
		8 <= 5	false

If Statements

- An if statement tests a condition to see if it is true
- If the condition is true, a statement or block of statements is executed
- If the condition is not true, the code branches to the statement after the if block

- Model:

```
if (true/false question) {  
    statement(s); // executes only if question evaluates to true  
}
```

Example: Score Rater Program

- Demonstrates the if statement
- Plan:
 - Ask the user to enter their score
 - Read the score into a variable
 - Tell the user “You did your best!”
 - If the score is greater than or equal to 1000, tell the user “Impressive score!”

If-Else Blocks

- An else statement can follow an if statement to execute code when the if condition is false
- Model:

```
if (true/false question) {  
    statement(s)1; // executes if condition is true  
} else {  
    statement(s)2; // executes if condition is false  
}
```

Example: Score Rater 2.0

- Plan:
 - Ask the user to enter their score
 - Read the score into a variable
 - If the score is greater than or equal to 1000, tell the user “Impressive score!”
 - If the score is less than 1000, tell the user “You need some practice.”

Multiple Ways to Branch

- If there are more than two ways to branch, you can chain if statements together that get tested in order
- The statement associated with the first if condition that evaluates to true is executed
- If no if condition is true, the final (optional) else statement is executed

Model:

```
if (true/false question1) {  
    statement(s)1;  
}  
else if (true/false question2) {  
    statement(s)2;  
}  
...  
else if (true/false questionN) {  
    statement(s)N;  
}  
else {  
    statement(s)N+1;  
}
```


Example: Score Rater 3.0

- Plan:
 - Ask the user to enter their score
 - Read the score into a variable
 - If the score is greater than 1000, tell the user “Impressive score!”
 - If the score greater than 500, tell the user “Nice job.”
 - If the score is greater than 250, tell the user “Decent.”
 - Otherwise tell the user “You need some practice.”