Outline

Expressions

Flow of Control

  Selective Control (if statement)

  Loop

Project 2
Logical Operators

&&: AND
- true and false =

||: OR
- false and true =
- true or false =
- false or true =
- not true =
- not false =
Logical Operators

&&: AND
- true and false = false

| |: OR
- false and true = false

!: NOT
- true or false = true
- false or true = true
- not true = false
- not false = true
Example

Valid Expressions?

\[ x < 5 \land \land > 3 \]
Example

Valid Expressions?

\[ x < 5 \land x > 3 \]

\[ x < 5 \land x > 3 \]
Example

Valid Expressions?

3 < x < 5
Example

Valid Expressions?

3 < x < 5

(3 < x) && (x < 5)
If-else Statement

```c
if (<expr>) {
    // stmts
} else if (<expr>) {
    // stmts
} else if (<expr>) {
    // stmts
} else {
    // stmts
}
```
Example

```cpp
int x = 0;
if (x == 0)
    cout << "here\n";
else
    cout << "there\n";
```
Example

```cpp
int x = 0;
if (x == 0)
    cout << "here\n";
else
    cout << "there\n";
```
Example

```cpp
int x = 5;
int y = 1;
if (5 == (x && !y))
    cout << "here\n";
else
    cout << "there\n";
```
Example

```cpp
int x = 5;
int y = 1;
if (5 == (x && !y))
    cout << "here\n";
else
    cout << "there\n";
```
Switch Statement

```
switch (<expr>) {
    case <const1>:
        // stmts
        break;
    case <const2>:
        // stmts
        break;
    default:
        // stmts
}
```
Example: Grading Program

Output:

You passed
Your grade is D
Example

Output?

```c++
int x=0;

switch(x)
{
    case 1: cout<<"One";
    case 0: cout<<"Zero";
    case 2: cout<<"Hello World";
}
```
Example

Output?

ZeroHello World

```cpp
int x=0;
switch(x)
{
    case 1: cout<<"One";
    case 0: cout<<"Zero";
    case 2: cout<<"Hello World";
}
```
Loop: While Statement

while (<expr>)
    // stmt

while (<expr>) {
    /* code block */
}

Diagram:
- Enter While loop
- Check test expression
- Execute loop statement
- Exit loop
- If False, go back to Check test expression
Loop: Do-While Statement

do {
    /* code block */
} while (<expr>);
Loop: Do-While Statement

Difference from while loop:

1. The code block gets executed at least once, no matter if the condition is satisfied or not.
2. Don’t forget the semicolon at the end.

```plaintext
do {
    /* code block */
} while (<expr>);
```
Example

Output?

```cpp
int x = 3;
while (x > 0) {
    cout << "hello\n";
    x--;  
}
```
Example

Output?

```cpp
int x = 3;
while (x > 0) {
    cout << "hello\n";
    x--;}
```
Example

Output?

```c
int x = 3;
do {
    cout << "hello\n";
x--;
} while (x > 0);
```
Example

Output?

```cpp
int x = 3;
do {
    cout << "hello\n";
    x--;    
} while (x > 0);
```
Example

Output?

```cpp
int x = 3;
do {
    cout << "hello\n";
} while (x-- > 0);
```
Example

Output?

```cpp
int x = 3;
do {
    cout << "hello\n";
} while (x-- > 0);
```
Example

Output?

```cpp
int x = 3;
do {
    cout << "hello\n";
} while (--x > 0);
```
Example

Output?

```cpp
int x = 3;
do {
    cout << "hello\n";
} while (--x > 0);
```
Loop: For Statement

```c
for (initialization; cond; de/increase)
    // stmt
```

```c
for (initialization; cond; de/increase) {
    /* code block */
}
```

Three parts:

1. Initialization; 2. Condition; 3. Decrease or increase
Loop: For Statement

```cpp
for (int x = 3; x > 0; x--) {
    cout << x << endl;
}
```

Output:

3
2
1
Iterate strings

Output:

```cpp
string s = "Hello";
char c = s[4]; // 'o'
for (int k = 0; k != s.size(); k++)
    cout << s[k] << endl;
```
Project 2: Cell Phone Fee Calculator

The program you write must accept as input the customer's name, the number of talking minutes used during the month and whether unlimited texting, unlimited web surfing and unlimited wifi hotspots should be included in the cell plan.
Project 2: Cell Phone Fee Calculator

Here is an example of a dialog with the program:

Customer Name: Howard Stahl
Want unlimited texting? Yes
Want unlimited web? No
Want wifi hotspots? No
How many minutes talking did you use this month? 10
Howard Stahl, your charges this month are $41.00.
Project 2: Cell Phone Fee Calculator

- If the texting answer is not "Yes" or "No":
  
  Your texting answer must be either Yes or No.

- If an empty string was provided for the customer name:
  
  You must enter a valid name.

- If the web answer is not "Yes" or "No":
  
  Your web answer must be either Yes or No.

- If the wifi answer is not "Yes" or "No":
  
  Your wifi answer must be either Yes or No.

- If the minutes talking is less than zero:
  
  Your minutes talking must not be negative.

- If the input is valid and none of the preceding situations holds:
  
  name, your charges this month are $amount.
Project 2: Cell Phone Fee Calculator

Due: Thursday, 12 July 2018, 9:00 PM

Submit a zip file named Project2.zip containing these three files:

1. cellphone.cpp
2. report.doc / report.docx / report.txt
3. hw.doc / hw.docx / hw.txt

Do not include anything else in the zip file