CPSC 1045: Inputs, if...else

Code blocks

Statements between curly braces, {...}, is called a code block. The first place that code blocks are introduced is in conditional statement.

Control Statements

So far our programs have been list of instructions. This applies to both the HTML files and the JavaScript you wrote in the last lab. Conditional statements is what we call a control structure, it's also the first thing that causes our program not to run strictly from beginning to end.

if, else if, and else statement

The first condition is always an if, followed by a Boolean expression

```
if(condition1){
    //Runs if condition 1 is true
} else if(condition2){
  //Runs if condition 2 is true
  //And condition 1 is false
}else{
  //Only runs if all the previous conditions are false
}
```

In the above example only one code block executes. An alternative interpretation is that blocks of code have been skipped.

Example 1:

```
var question = 4;
var answer;

if(question === 6){
    answer = 2;
} else {
  answer = 9;
}
```

In the above example `answer` will have the value of 9 after the code executes, because the value of the Boolean expression after the if statement is false.

Inputs: Prompt

In this lab we will use the **prompt** to get input. Note that we only use prompt in two situations. One is for debugging and the second is for learning. We shall see how to get input directly from the webpage in future labs.

Prompt brings up a **modal dialog** box, that does not go away until the user enters some input.

What is a **modal dialog** box?

To explain modal dialog boxes, we need to a simple code example and utilize our knowledge of expression evaluation.

```
var userInput = "";
userInput = prompt("Enter some sentence please");
```

How do we interpret the statement?

```
userInput = prompt("Enter some sentence please");
```

We break it down like any other statement. Here we have a function call, where the function is named **prompt**.   A function is a separate piece of code that we don't know exactly what it is doing, but we can use through its name. In this case **prompt**.

First we evaluate the arguments. Since it's just a string we don't have to do much. But we can imagine more complex evaluations can also go here. Next we evaluate the function call.

```
prompt("Enter some sentence please");
```

What does **prompt** do?

Prompt brings up a dialog that presents the user with the string, in this case "Enter some sentence please" and then waits for input.
You program does not continue running, until the user types in some input and press enter.

```
prompt("Enter some sentence please");
```
Evaluates to whatever the user typed in.

Once we have the value, it is assigned to our variable and our program continues executing. We can then do some meaningful things with the value.

Example:

```javascript
var userResponse1 ="";
userResponse1 = prompt("Do you wish to continue yes/no");

if (userResponse1 === "yes") {
    console.log("You wish to continue");
} else if( userResponse === "no"){
    console.log("you do not wish to continue");
} else {
    console.log("I do not understand");

}
```

The above example asks if the user wishes to continue, and waits for their response.
Since there are three possibilities for the response, we have 3 blocks of code. They
can enter "yes", "no", or something else entirely. Depending what the user entered,
a different action is taken.

Sometimes we want to convert the input to a number so that we can use the result.

```javascript
var userResponse1 = prompt("Enter a number:");
var enteredNumber = Number(userRsponse1);

if(!isNaN(enteredNumber)){
   if(enteredNumber > 5){
     console.log("You number is bigger than 5!");
   } else if (enteredNumber < 4){
      console.log("Your number is less than 4");
   } else{
      console.log("You number is 4 or 5");
   }
}
else{
   console.log("You did not enter a number!!!");
}
```

When we convert to a number, sometimes it will fail. If the user did not enter a
number, the **Number** function will return or evaluate to **NaN**. So we have to check if
the user actually entered a number that JavaScript understands. If it is a number,
then we use it to execute some logic, in this case we check if it's 4 or 5.

It's good practice to convert a string to a number first, because of the '+' operator.

Example1 : Simple Prompt program
promtExample.html:
```html
<!DOCTYPE html>
```

```
<head>
      <title>Example using prompt</title>
</head>
<body>
      <h1> Prompt and if Example!</h1>
      <section id="outputSection"></section>
      <script src="promptExample.js"></script>
</body>
```

promptExample.js:
```
//Get a string
var userInput = prompt("Please enter a number between 1 and 5");
var inputNum = Number(userInput);   // Convert the string to a number
var outputSection = document.getElementById("outputSection");

if(isNaN(inputNum)){
    outputSection.innerHTML = "You did not enter a number!"
}else{
   if(inputNum >=1 && inputNum <=5){
      outputSection.innerHTML = "Your number was " + inputNum;
   } else {
      outputSection.innerHTML = "Number out of range";
   }
}
```

The above example asks the user to enter a number from 1 to 5. It then changes the webpage according to what the user has entered.

Example 2: Using prompt and if to check for specific input.

filename:IfPrompt.html
```
<!DOCTYPE html>
<head>
   <title>If statement example</title>
   <meta charset="UTF-8">
   <script src="IfPrompt.js" defer></script>
</head>
<body>
   <h1>If example</h1>
    <div id="output"></div>
</body>
```

filename: IfPrompt.js
```
var outputSection = document.getElementById("output");

//Get some input from the user.
var word1 = prompt("Enter a word that begins with A.");
var word2 = prompt("Enter a word that begins with B.");
var numberString = prompt("Enter a number.");
var num = Number(numberString);

if(word1.toLocaleUpperCase().substring(0,1) === "A" &&
   word2.toLocaleUpperCase().substring(0,1) === "B" &&
   !isNaN(num)){
   outputSection.innerHTML = "A word :" + word1 + "<br>" +
           "B word:" + word2 + "<br>" +
```

```
            "number :" +num;
} else {
    outputSection.innerHTML = "One or more of your"+
            " inputs were incorrect";
}
```

Example 3: Math quiz with visual aid.

filename:IfMathTest.html

```
<!DOCTYPE html>
<head>
    <title>If statement example 2</title>
    <meta charset="UTF-8">
    <script src="IfMathTest.js" defer></script>
</head>
<body>
    <h1>Math question: Pythagoras</h1>
    <div id="output" ></div>
    <canvas id="picture" width="200px" height="200px"
        style="border : solid"></canvas>
</body>
```

filename:IfMathTest.js

```
var answerString=prompt("What is the length of the hypotenuse of a "+
                        "triangle with sides 3m and 4 m");
var answer = Number(answerString);
const realAnswer = 5;
const scale = 20;
var canvas = document.getElementById("picture");
var ctx = canvas.getContext("2d");
var output = document.getElementById("output");

ctx.strokeStyle = "blue";
ctx.save();
ctx.translate(10,190);

//draw the 3m and 4m sides
ctx.beginPath();
ctx.lineTo(4*scale,0);
ctx.lineTo(4*scale,-3*scale);
ctx.stroke();
ctx.beginPath();
ctx.lineTo(0,0);
ctx.lineTo(4*scale,0);
ctx.stroke();

//Choose color and display message to the user.
if( answer === realAnswer){
  output.innerHTML = "Correct!";
  ctx.strokeStyle = "blue";
} else if( answer < realAnswer) {
  output.innerHTML = "Answer is too small";
  ctx.strokeStyle = "red";
} else if ( answer > realAnswer) {
  output.innerHTML = "Answer is too big";
  ctx.strokeStyle = "red";
}
```

```
//draw the hypotenuse the use guessed.
ctx.beginPath();
ctx.lineTo(0,0);
ctx.lineTo(answer/realAnswer*(4*scale), answer/realAnswer*(-3*scale));
ctx.stroke();

ctx.restore();
```