Title: Off to the movies

## Summary

Create a simple program using a text-based programming language to generate an output based on two possible input options. This is a simple Boolean (true/false) application where its asks the user’s age - if you are over 15 then you can watch G and M rated movies - if you are under 15, then you can only watch G rated movies. This lesson was designed in collaboration with Jason Vearing QSITE (Gold Coast Chapter).

## Description

In this example we are using JavaScript but the same task can be completed in Python. While considered simple, the program draws on fundamental programming concepts such as creating an event, defining a function, declaring and assigning a variable, creating a string, using if-else statements.

Australian Curriculum

* Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors (ACTDIP029)
* Students design user experiences and algorithms incorporating branching and iterations, and test, modify and implement digital solutions. (ACTDIP030)

Keywords

Algorithms, Branching, User input, JavaScript, Text based programming, General purpose programming, Code, Code editor, W3Schools, Functions, Variables, String

## Learning hook

Imagine an online kiosk that provides a selection of tickets for the movies. The start of the program is to know the user’s age and provide a simple message.

We want to build a simple program that welcomes you to the movie theatre and asks your age. If you **enter** your age as under 15, then you can only watch G movies. If you enter your age as 15 or over then you can watch G and M rated movies. The program starts by the user clicking a button.

## Learning map and outcomes

In this task students will use and develop some important programming skills.

To build the end program a useful approach is to build in stages and encourage students to test as they go. They check for errors as they run the program and trace any errors and modify the code as necessary. Ask them to keep a record of how they have used this approach to build their program.

Before starting to build their program using a text based programming language, ask them to create an algorithm in Pseudocode. This will help them think about the programming requirements and the logical flow.

## Learning input

Model and share how to create the Pseudocode with the class. Discuss the types of code they expect to use in their JavaScript program.

Pseudocode (example)

START: Select ‘Click here’ button

OUTPUT: Welcome to the movies. How old are you?

IF INPUT: less than 15

THEN OUTPUT: You can only watch G rated movies.

ELSE IF INPUT: 15 or greater

THEN OUTPUT: You can watch G and M rated movies.

END

Provide students with the link to W3Schools code editor to create and run their JavaScript program. For any students unfamiliar with this code editor demonstrate or ask a student with expertise how to create a simple string, add a button, change text onscreen etc.

## Learning construction

Provide a list of steps in building the program to which students can refer, for example:

This can be provided in an online space where students add to this document as required.

|  |  |  |
| --- | --- | --- |
| **Stages**  | JavaScript (JS) code examples | Comments  |
| **Create a button** | <button> </button><button>start</button><button>click here</button> | // empty button// start button // click here button |
| **Create an event**Turn ‘click here’ button into ‘onclick’ | <**button** *onclick*="myFunction();"> Click here</**button**><button onclick="howOld();">Click here</button> | // general code example // code example with function named as howOld |
| **Create myfunction and use myfunction** | function howOld() | // howOld function defined  |
| **Output** | alert(“test”)prompt(“test”) | // use to test function and show alert box// use to test function and show prompt box |
| **Declare a variable/Assign a variable** | var answerid=userInputdocument.getElementbyId | // variable// define id as user input// look from start of program for id |
| **String** | “text + var + test” “you are + answer + years of age” | // string using a variable// string using a variable for user input of age |
| **Use if/else**  | **if** (answer is <= 15) {document.getElementbyId (‘userInput’).innerHTML = ‘you can only watch G rated movies”;} **else** { document.getElementbyId (‘userInput’).innerHTML = ‘you can watch G and M rated movies”;} | // logical condition// executed if condition is true// else is executed if condition is false |

## Learning input

For students that require support

[Refer to this completed code](https://www.w3schools.com/code/tryit.asp?filename=FUP35MLCU1FI) to assist students that require support to get the code to function as intended.

Compare their code to this code and provide guidance as to what they have entered incorrectly.

To trace errors, check for:

* incorrect use of brackets { and }
* including opening a script and closing the script <script> </script>
* exact use of variable ID in function (sometimes students mistype)
* make sure onclick has an associated function
* include an answer = prompt
* semi colons at end

### Challenge

1. Continue to build the program and offer a third age option ‘18 and over’.
2. Continue to build the program and offer a selection of movies based on the user’s age. The user selects the movie and the correct movie is ‘printed’ onscreen.
3. Reuse and modify the code for another purpose. For example, choose a different question which requires two options for an answer, create a function, declare and assign the variables, show output as a string.

## Resources

Teacher background

* View this [YouTube video tutorial](https://www.youtube.com/watch?v=NAZvNAZo3QU) created by Jason Vearing showing how to build the program using Scratch first then showing how to build in stages in JavaScript.

Code editor and programming resources

* Use this website [W3Schools My First JavaScript](https://www.w3schools.com/js/tryit.asp?filename=tryjs_myfirst) to use the code editor to create and run your program built in JavaScript:
* This [JS CheatSheet](https://htmlcheatsheet.com/js/) provides a comprehensive list of example code that can be used to implement a JavaScript program.

Assessment: Self-assessment

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_

Project

Algorithm written in pseudocode

I can *(circle the skills you have demonstrated or write in any other skills)*

|  |  |
| --- | --- |
| **Create a simple button**- click here button to start | **Create an event**‘onclick’ button to find a function |
| **Define a function** -for how old the user is | **Use a string** - welcome text- response to user input |
| **Declare and assign a variable** - variable for user input of age | **Use if/else statements**- two options depending on user input for age |
|  |  |

A screen capture of my code and what displays onscreen selecting ‘Run’

Read the following rubric.

Circle the description that best describes your programming on this project.

|  |  |  |  |
| --- | --- | --- | --- |
| 1 point | 2 points | 3 points | 4 points |
| I created the program but needed a lot of guidance and help from others. I have learned up to 2 new programming skills and identified these skills using the ‘I can’ statements. | I created the program with a little help from others. I have learned up to 3 new programming skills and identified these skills using the ‘I can’ statements. | I created my own program following suggested steps. When I got stuck I sought help. I have described clearly the challenges I had and how I overcame them. I have learned up to 5 new programming skills and identified these skills using the ‘I can’ statements. | I created my own program. When I got stuck I sought help. I also helped others when they got stuck. I have described clearly any challenges I had and how I overcame them. I have learned or used more than 5 programming skills and identified these skills using the ‘I can’ statements. |

What three things have learned about programming with JavaScript?