

3: Basic Building Blocks: Multiway Selection Worksheet

Aim:

The aim of this worksheet is to:

- understand multiway selection control structure
- create a working Javascript program that contains a multiway selection

Control structure - Multiway Selection

If a series of options are required you can use Multiway Selection Control Structure.

```

BEGIN
    CASEWHERE expression evaluates to
        A: Process A
        B: Process B
        C: Process C
        .....
    OTHERWISE
        Process...
    ENDCASE
END
  
```

Problem Statement

Create a program that will input users Name and Age (integer) and output their Name and School Level including Infants(5-7), Primary(8-12), Middle(13-16) and Senior(17-18) schools.

Solution – IPO chart

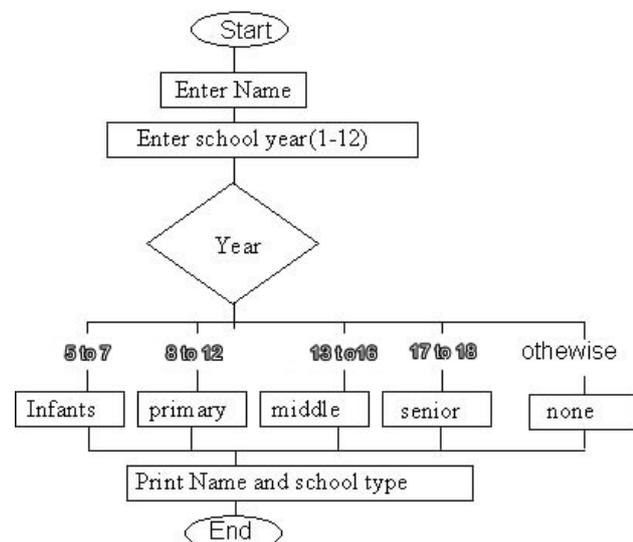
Input	Process	Output
Name Age	Check age to determine school level Between 5-7: infant Between 8-12: primary Between 13-16: middle school Between 17-18: senior school Otherwise no school	Name and school level

Solution - Algorithm

Pseudocode and flowchart

```

BEGIN
    Enter Name
    Enter Age
    CASEWARE age
    CASE 5 to 7
        PRINT 'Name is in infants school'
    CASE 8 to 12
        PRINT 'Name is in primary school'
    CASE 13 to 16
        PRINT 'Name is in middle school'
    CASE 17 to 18
        PRINT 'Name is in senior school'
    OTHERWISE
        PRINT 'None'
    ENDCASE
END
  
```



Activity 1: Draw flowchart

Draw the flowchart for the CASEWHERE control structure on the top of the previous page.

Activity 2: Create the JavaScript program code

Create the JavaScript code for the Example Problem above and save it to the appropriate Solutions folder in your mobile website.

1. Copy the code in Figure 1 into the section tag of the **multiwaySolAct2.html** file
2. **Add the comments** to the top of the pages including your name and detail of the page/code

Figure 1: HTML and JavaScript code

```

Example Multiway Selection: from Worksheet 3<br>
What schools level should you be?<br>

<form name="form">
  Enter Name: <input name="name" type="text" id="name"/><br>
  Enter Age<input name="age" type="text" id="age" /><br>
  <input type="button" value="submit" onClick="process()" />
</form> <br>

Answer <div id="answer"> </div>

<script type="text/javascript">
  function process(){
    var name = new String(document.form.name.value);
    var age = new Number(document.form.age.value);
    var school = String;
    switch (true) {
      case (age >= 5 && age <= 7):
        school = "infants";
        break;
      case (age >= 8 && age <= 12):
        school = "primary";
        break;
      case (age >= 13 && age <= 16):
        school = "middle";
        break;
      case (age >= 17 && age <= 18):
        school = "senior";
        break;
      default:
        school = "no school";
        break;
    } //end casewhere
    document.getElementById('answer').innerHTML = name + "
whose age is " + age+ " is in " + school;
  } //end of function
</script>

```

Activity 3: Test the program

Test the Javascript program from Activity 2, complete the table below and answer the question using following test data.

input (age)	Expected Output	Actual Output
5	"name" is in infants	
9	"name" is in primary	
13	"name" is in middle	
18	"name" is in senior	
1	"no school"	
24	"no school"	

Does the program produce the expected output? If no, why?

What do the break statements do in the JavaScript multiway selection code? What will happen if you do not have them?

Activity 4: Add other selections

Modify the pseudocode algorithm below to add the following conditions:

- an age of 0 to 4 is entered then the output is - "name" to young for school
- an age of greater than 18 is entered then the output is - "name" has left school.

```

BEGIN
  Enter Name; Name
  Enter Age; age
  CASEWHERE age

    CASE 5 to 7
      PRINT 'Name is in infants school'
    CASE 8 to 12
      PRINT 'Name is in primary school'
    CASE 13 to 16
      PRINT 'Name is in secondary school'
    CASE 17 to 18
      PRINT 'Name is in senior school'

    OTHERWISE
      PRINT 'None'
  END CASE
END

```

Activity 5: Modify the Javascript code

- Modify your JavaScript code (from Activity 1) to include the changes from the above activity 4 and get it running in put the section tag of the **multiwaySolAct5.html** file in the Solutions Folder
- Add the comments** to the top of the pages including your name and detail of the page/code

Activity 6 Extension: Convert multiway to nested if

Investigate other problems could be written using the multiway control structure?

Convert the above Multiway Solution **to** "Nested IF". Save solution in **multiwaySolExt6.html** file in the Solutions Folder