Conditional Statements part 2

Interesting points:

> What is an SWITCH?

> Why do we need it?

> When do we need it?

> Examples

Conditional constructs... What are these?

Conditional constructs are structures consisted of commands. These commands/actions will be executed upon a condition (meaning a logic test) that evaluates to true or false. Conditional constructs are engineered through IF instructions. Let us be more detailed:

A SWITCH instruction is a conditional statement which checks the value of a variable and triggers an action according to it, with one action available for each possible value of the variable . **If** the variable is worth a certain value, **then** a set of related actions will be executed.
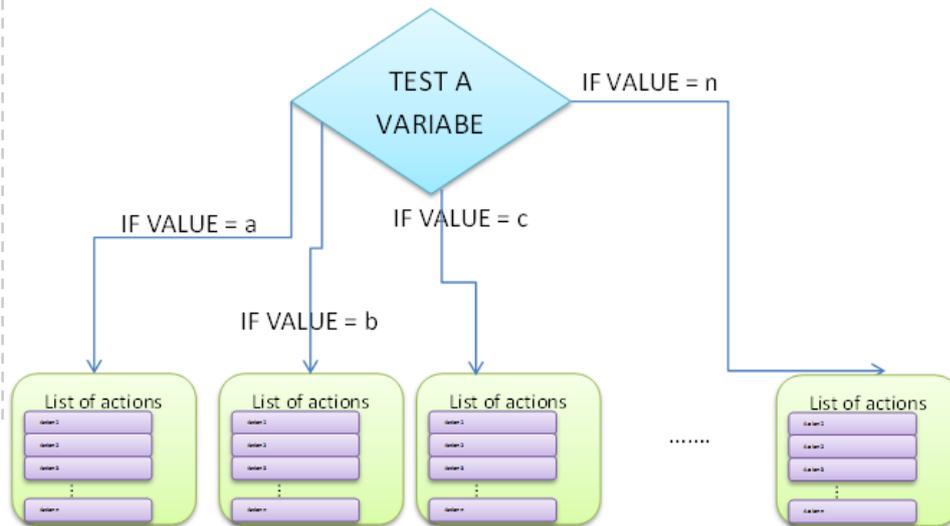
A SWITCH instruction be represented by the pseudo code below :

```
SWITCH
(test)
CASE test=a
(list of actions)
CASE test=b
(list of actions)
CASE test=c
(list of actions)
CASE test=d
(list of actions)
CASE test=e
(list of actions)
. . .
```

The consequent action and the alternative action are not limited to one and only one action. The user can give several actions. For this reason we are usually use the term **'set of actions'.** There is a limitation n the cMinds demonstrator to only one action per possible value of the tested variable.

Conditional Statements part 2
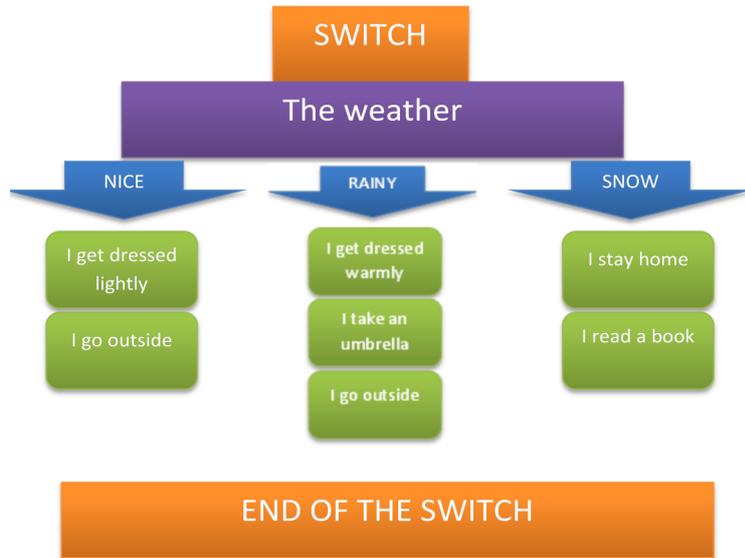
Why do we need conditional statements?

A conditional statement is actually a structure that provides a deep level of control over what happens when the program is being executed.

In this sense, the main function of a conditional statement is to give the programmer a level of control of the flow of statements executing when an application runs.

A SWITCH instruction can be compared can be compared to an open question: there are many possible answers to the statement tested and each answer triggers a certain amount of consequent actions.

For example, the sentence: ''*I wonder what the weather is like outside. If it's sunny I should get dressed lightly and go outside, if it's raining I should take an umbrella and dress more warmly and if it's snowing I can stay home and read a book'* can be summed up into this schema :

When do we need conditional statements?

If we want to **control the flow of code execution** depending on

- what the program has already done or
- what it has just emerged

we need to use conditional constructs.

As we have previously mentioned, conditions that evaluate to true or false are used to test what has the program already done, what has just emerged etc.

But such conditions might be insufficient when some variables can take more than simply two values. When we want to tell our program to execute a certain section of code according to all the possible values of a particular test, we use a SWITCH statement.

To sum up, when we want to decide which action to perform in reaction to many different possible situations , we can take this decision by using a conditional SWITCH construct and evaluating a variable.

> **The SWITCH statement is used to test a given variable for many different value and act accordingly to which value the variable actually has.**
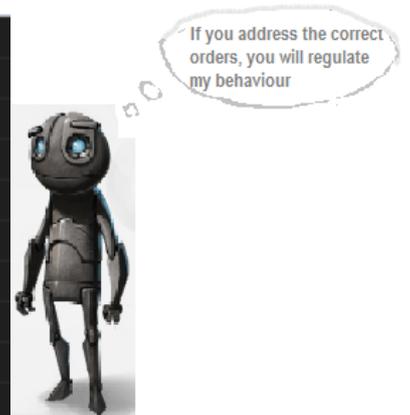
Conditional Statements in cMinds…

In the cMinds demonstrator, the SWITCH code automatically adapts to its environment.

When the SWITCH is dragged and dropped, a field to put the tested variable appears immediately, guiding the user. A little upside-down SWITCH appears also, to signal the end of this piece of code.

Once the tested variable is dragged in place, automatically a new field appears to put the first possible value of the test.

Once a value is dragged, a blue arrow image appears with a field to put the consequent action. Once the action is put in, a new field for another value of the test appears and this continues as long as the user needs.

Can you now give us an example from the tutorial area?
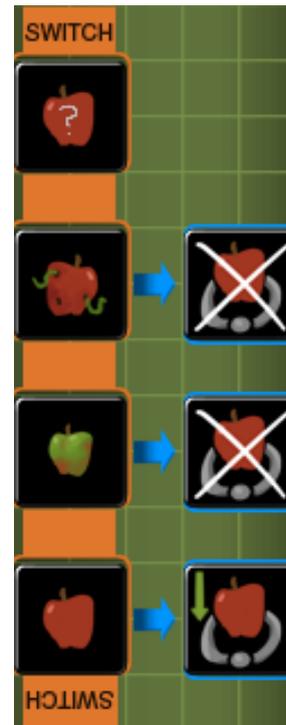
Tutorial area

The script ► ►

Let's consider the case where the user wants to instruct the robot to pick an apple. But an apple can have several possible states: it can be just ripe, or not ripe enough or too ripe and have some worms. The robot should only pick the apple if it is ripe.
To give this instruction to the robot, the user can use a SWITCH construct.

Which is the variable that is evaluated ?
The apple degree of maturation

Graphical representation ▼

SWITCH

The apple on top of the robot

RIPE

NOT RIPE

CONTAINS WORMS

The robot picks the apple

The robot doesn't pick the apple

The robot doesn't pick the apple

END OF THE SWITCH