

Topic 2.2 Programming (1)

Variables and constants are used to store values in algorithms and programs. Variables and constants are defined as 'a named memory location'.

Variables' values can change while a program is running.

Constants' values must not change while a program is running.

Rules for naming variables/constants:

- Identifiers are the name of the variable or constant.
- They should 'describe' the data being stored.
- Short identifiers are quick/easy to write.
- Long identifiers are more descriptive.
- Identifiers cannot contain spaces must be consistent throughout the program.

CamelCaseUsesUpperAndLowerCaseLetters Snake case links all the words with an underscore.

Operators are special characters that perform certain functions.

The assignment operator is =

It is used to assign values to constants or variables.

Comparison operators compare the value or expression on their left hand side to the value or expression on the right hand side and produce a Boolean value (True or False)

INPUT: Data that is put into the algorithm or program by the user.

OUTPUT:

- Data that is taken out of the program or algorithm and displayed to the user.
- This is usually done using a print statement.

SEQUENCE: Instructions are followed, one after the other in the order they are written.

SELECTION: Used in algorithms or programs to choose between two or more options.

Selection usually uses a combination of IF, ELSE and ELSE-IF statements.

IF/ ELSE statements are used when there are only 2 options.

- IF = QUESTION, followed by what to do if the answer is
- ELSE, what to do if the answer is False

true.

If there are more than 2 options, ELSE-IF is used.

Switch-case statements can also be used in selection:

• They are used when you want to perform different actions based on the value of ONE variable's value.

'IF usertype == "Teacher" THEN 👞

Allow unrestricted access.

"ELSEIF usertype == "Parent" THEN 🗢

ELSEIF usertype == "Pupil" THEN

Allow level 1 restricted access.

Allow level 2 restricted access.

INT johnvote = 0, suevote = 0, alanvote = 0

Converts to an integer

Converts into a real number

Converts into Boolean

Converts to a string

Converts into ASCII code

Converts into ASCII character

int()

float()

bool()

str()

ASC()

CHR()

ELSE

ENDIF

→ Denv all access.

a fixed number of times OR until there is a desired outcome. Iteration is carried out using a programming construct called 'loops'.

ITERATION: The process of repeating a set of instructions for

COUNT CONTROLLED loops repeat code a fixed number of times.

The number of iterations is known before the loop is started.

CONDITION CONTROLLED: loops are used when the

number of iterations needed is not known.

The code is iterated while or until a condition is met. **Arithmetic operators:** Characters that perform arithmetic functions.

Addition

Subtraction

DATA TYPE: A category or classification of data. Used to make programs more robust and memory efficient.

- INTEGER: A negative or positive WHOLE number.
- REAL: A negative or positive decimal number.
- CHARACTER: A SINGLE number, letter or symbol.
- STRING: A collection of characters enclosed in speech marks.
- **BOOLEAN: True or False**

CASTING: A function which converts an item of data into a different data type.

* Multiplication Division (decimal answer)

** To the power of...

// Division (integer answer) DIV

% Divides and returns the MOD remainder.



GCSE Computer Science - Topic 2.2 Programming (1)

What I need to know:

Chata hayyyariahlar and asystanta are yeard in	U
State how variables and constants are used in	
programming.	-
Define variable.	
Define constant.	
Outline the rules for naming constants/variables.	
State what is meant by an operator	4
State what the assignment operator is used for in programming.	
State the function of comparison operators.	
Define the terms input / output.	
Define the term sequence.	
Outline what selection is used for in programming.	
Define the term 'iteration'.	
Describe the difference between count-controlled and condition controlled iteration.	
Define the term data type.	
Outline the 5 main data types.] L]
Define the term casting.	
Outline the function of the 6 main casting commands.	
Define the term arithmetic operator.	
	1 1

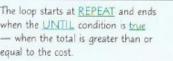
List the 7 main arithmetic operators and their

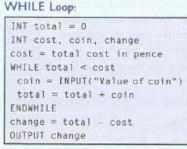
mathematic function.

```
REPEAT Loop:

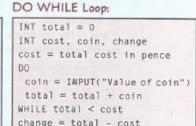
INT total = 0
INT cost, coin, change cost = total cost in pence REPEAT coin = INPUT("Value of coin") total = total + coin
UNTIL total ≥ cost change = total - cost OUTPUT change

The loop starts at REPEAT and ends
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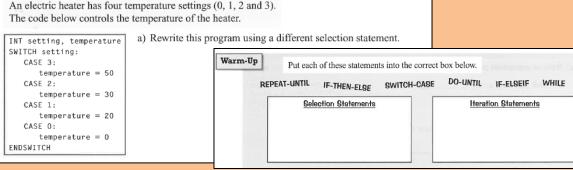
The loop starts by checking the WHILE condition is true and keeps repeating until it is false — when the total is greater than or equal to the cost.



The loop starts at DQ and repeats until the WHILE condition is false—when the total is greater than or equal to the cost.

OUTPUT change

Describe the differences between **repeat**, **while** and **do while** iteration.



[1]

Jasminda has written the following program to convert minutes into hours and	minutes.	
<pre>INT minutes, hours, mins minutes = INPUT("Enter a number of minutes") hours = minutes DIV 60 mins = minutes MOD 60 print(str(hours) + " hours and " + str(mins) + " minutes")</pre>		
a) Is this an example of a sequence, selection or iteration? Tick the correct box.		
Sequence Selection Iterati	on	[1]
b) What would the program print if the input was 150?		

State what the code will do in each of the following
a) int("76423")
b) ASC("T")
c) 12 MOD 5