

8.3 Programming with python

Variables and constants are used to store values in algorithms and programs.

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.

SEQUENCE EXAMPLE:

```
print ("Hello World")
Weather = input ("What is the weather like today?")
print ("Enjoy the",Weather,"today")
```

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.

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

- IF = QUESTION, followed by what to do if the answer is true.
- ELSE, what to do if the answer is False
- If there are more than 2 options, ELIF is used.

ITERATION: The process of repeating a set of instructions for a fixed number of times OR until there is a desired outcome.

Iteration is carried out using a programming construct called 'loops'.

ITERATION EXAMPLE: Using While True will loop to ask the age of the user.

```
while True:
    age = int(input("Enter your age: "))
```

```
    if age < 13:
        print("You are a child.")
    else:
        print("You are a teenager.")
```

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

- **INTEGER (INT):** A negative or positive WHOLE number.
- **STRING:** A collection of characters enclosed in speech marks. "Hello World"
- **BOOLEAN:** True or False

Arithmetic operators: Characters that perform arithmetic functions.

+	Addition
-	Subtraction
*	Multiplication
/	Division (decimal answer)
>=	Greater Than or Equal to
<=	Less Than or Equal to

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What I need to know:

What are variables / constants used for in programming?			
Define variable.			
Define constant.			
What is an operator?			
What is the = operator used for?			
What is the function of comparison operators?			
Define the terms input / output.			
Define the term sequence.			
Practically use sequence coding in your programming			
Outline what selection is used for in programming.			
Practically use selection coding in your programming			
Define the term 'iteration'.			
Practically use selection coding in your programming			
Define the use of INT/ Integers in coding.			
Define arithmetic operators and their mathematic functions.			