

Key Vocabulary...

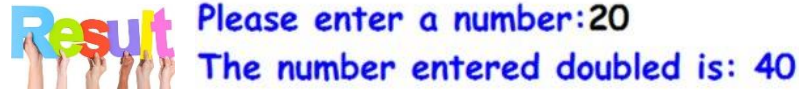


Picture This...

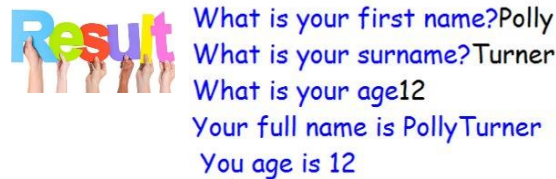
Always Remember...

Term	Definition
Variable	A value that can change while the program is running.
Algorithm	A step by step set of rules in order to solve a problem.
String	A data type for text e.g., hello.
Boolean	A logic system using the operators AND, OR and NOT. The Boolean data can take one of two values, either true or false.
Float	A data type for numbers with a decimal point. e.g., 23.6
Integer	A data type for whole numbers. e.g., 30
Sequencing	Instructions arranged in a specific order.
Iteration	Looping or repeating sections of a program.
Input Output	Requires the user to enter something. Prints something for the user to see.
Selection	Decisions or questions used to make algorithms more realistic.
Debugging	Identifying and fixing errors within the program.

```
num = input ("Please enter a number:")
answer = int (num) * 2
print ("The number entered doubled is: " + str(answer))
```



```
#Variable that stores the day of the week
firstName = input ("What is your first name?")
surName = input ("What is your surname?")
age = input ("What is your age")
id = (firstName + surName)
print ("Your full name is" , id, "\n You age is" , age)
```



There are four data types: Boolean, Integer, Float and String.

A float is used when a number needs a decimal point, and an integer is used when a whole number is needed.

There are three different types of loops: FOR, WHILE and INFINITE.

Variables are like boxes. They store values.

Bugs are errors in the code. There are two types of error a syntax error and a run time error.

If, Elif and Else commands are used to make decisions in a program.



Questions

1. Define the term variable.
2. What data type is the following piece of data 'hello'?
3. What data type is the following piece of data '23'?
4. Explain the purpose of commenting.
5. Define the term debugging.
6. Which command is used to create a decision?
7. Which command is used to get an output?
8. Which command is used to create a loop?

Deeper Learning...

Escape characters can be used to make an exception to a rule.

\t = Tabs items across  
 \n = Gets things to appear on a new line



Concatenation puts items side by side and merges them into one. For example, The words 'hot' and 'dog' are put together to make 'hotdog'. These skills are used in code by professionals to create applications that are used in companies such as NASA.

Activity – Write a program in pseudocode that works out the circumference of any circle.

## Key Vocabulary...

Term	Definition
Function	A module of code that is used for a specific task. Functions can be used over and over again in a program.
Parameter	The information required for a function to run.
Concatenation	The operation of joining two string together.
Import	Loading external functions ready to be used in a program.
Declaration	Assigning a value to a variable.
Typecasting	Casting a variable as a String, Integer, Float and Boolean.
Arrays	A data structure that stores value of the same data type.
Conditional	Branching steps that checks if something is True or False and carries out a set of instructions depending on the result.
Program Control	Selection of code to be executed based on the results of prior operations.

## Picture This...

We can see the data type by using the below code.

```
num_int = 456
num_string = "456"

print("num_int is the data type:", type(num_int))
print("num_string is the data type:", type(num_string))
```

Below is the result of the above code.

```
num_int is the data type: <class 'int'>
num_string is the data type: <class 'str'>
```

Below is an example of concatenation. If the two values are a numeric value, the + symbol will add the two numbers together. If it is a string it joins the string together.

### Code

```
x = "My "
y = "name "
z = "is "
a = x + y + z
print(a)

q = 10
w = 20
e = q + w
print(e)
```

### Result

```
My name is
30
```

## Always Remember...

We use functions in a lot of programs we create in Python. len(a) and print() are functions that are used when we first start using Python.

Python allows you to put multiple functions within a file called a module. Modules can be import into scripts and programs.

If you run this code in IDLE something unusual will happen.

```
from __future__ import braces
```



## Questions

1. Define the term variable.
2. Explain the purpose of commenting.
3. Define the term debugging.
4. Which command is used to create a decision?
5. Which command is used to create a loop?
6. Explain the difference between a function and a procedure.
7. Which type of brackets are used when creating a list in Python?

## Deeper Learning...

Strings and Integers in Python cannot be concatenated unless we convert the data type. This is called casting.

Python is used for Artificial Intelligence, Web Development and Game Development.

Arrays can be more than 2D lists. Programming makes use of 3D, 4D all the way up to 32 dimensional arrays.



**Activity** – Write a program in pseudocode that works out the area of a trapezium.

## Key Vocabulary...

Term	Definition
Database	A collection of data or information which is held together in an organised or logical way.
SQL	SQL stands for Structured Query Language. It is used to allow database developers to interrogate the data held in a database. SQL is used to generate queries.
Record	Is one row of detail about a single thing (entity).
Field	The columns names are called Fields. These are normally these are the top of the rows (headers).
Primary key	This is one field that is unique to every user.
Foreign key	A key used to link to tables together.
Table	Databases store data in tables.
Column	Hold a specific type of data, such as dates, numeric, or textual data. In the simplest of definitions, a column is defined by its name and data type.
Row	Holds data, usually unique to one record.
SELECT	This statement retrieves rows from the database. This is the mostly commonly used command.
FROM	This is used to list all the tables in any statement.
WHERE	Is used to filter results, only those records that match the statement will be displayed.

## Picture This...

This is an example of a simple database table.

First Name	Last Name	Address	City	Age
Mickey	Mouse	123 Fantasy Way	Anaheim	73
Bat	Man	321 Cavern Ave	Gotham	54
Wonder	Woman	987 Truth Way	Paradise	39
Donald	Duck	555 Quack Street	Mallard	65
Bugs	Bunny	567 Carrot Street	Rascal	58
Wiley	Coyote	999 Acme Way	Canyon	61
Cat	Woman	234 Purrfect Street	Hairball	32
Tweety	Bird	543	Itotitaw	28

```

1 SELECT [E-mail Address], Company
2 FROM Contacts
3 WHERE City='Seattle';
    
```

```

SELECT
    customer_id
FROM
    sales.customers
WHERE
    city = 'New York'
    
```

## Always Remember...

- 1.Data is a value with no obvious meaning.** eg 9.
- 2.Information is data with meaning.** The average man's shoe size is 9.
- 3.Knowledge is making use of information.** Should I stock plenty of size 9 shoes for men.

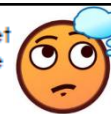


## Questions

1. Define the term data.
2. Define the term information.
3. Give the three SQL commands that make up a query.
4. Explain the purpose of data validation.
5. What is the main purpose of the data protection act?
6. What happens if a company breaks the data protection act?

## Deeper Learning...

Normalisation is used in relational databases to get rid of data redundancy. This means that the same data is not repeated in another table that is unlinked. The aim of this is to prevent human error when updating files. For example, your doctors share the same database at all hospitals, this is how they know your medical history. If they had separate files, treatment could be disastrous. If you had an allergy that either the doctor or the hospital was not aware of due to files not being updated and available to both parties, there could be serious consequences.



**Activity:** What is the difference between a flat file and a relational database?