Developing Computer Programs using the Python Programming Language (Unit 8-7)

Python is a **high-level programming language**. It can be used by beginners to create computer programs.

Many people use **IDLE** to create Python code. This is an **Integrated Development Environment**. It contains a **text-editor** for writing Python code and other tools that are helpful to programmers.

When you **save** a new Python program, the filename needs to end in **.py** so the computer knows it can be executed using Python.

If you make a mistake or type an error in your program, the code may not make sense when Python tries to execute it.
Python will stop running your program and try to show you **where** the error is in your code so you can fix it.
This is called a **syntax error**.

A **comment** is a line of text in your program code that the computer **will not execute**. It will be used by the computer when running a Python program. It is used as a **reminder** or as an **explanation** to someone about how your code works.
To make text into a comment, type in the the **#** symbol at the start of the line of text e.g. **# Main menu starts here**

Your programs can work with different **kinds** of data values. We call these **data-types**.

Integer	a **whole number**	e.g. **32**, **-7**, **0**
Real	a number that can contain a **decimal point**, these are called "float" values in Python	e.g. **3.14**
Boolean	a value that can only hold one of two possible states, either **True** or **False**	
Character	a **SINGLE character symbol**.	e.g. one **letter**, one **digit**, a **punctuation mark**. **'?'**
String	a **sequence** of **characters**.	e.g. **'This cheese smells.'**

Most Python programs use **variables**. A variable is a named value that can be **changed** during the execution of a program.
When we set the value for a variable, we call this **assignment** (we are assigning a value).
Use the **= assignment operator** to **set a value**   e.g.   **password = '$ecRet123'**

A **print** statement **displays a line of text on the screen**. This is an **output**.
Text enclosed by **' '** quotes will literally be displayed. Anything without quotes will display the value of a variable.

```
print( 'Hello' )
print( password )
```

An **input** statement allows people to type useful data **into** a program once it is running.
Whenever you type a data value into the computer, the value must be **stored** in a **variable** (so the computer does not lose it).

```
surname = input( 'Type in your surname... ' )
```

A program can make **decisions** while it is running to **choose** what should happen next. This is called **selection**.
It can **decide** whether or not something should happen, depending on whether a **condition** is found to be **True** or **False**.

```
if guesses <= 5 :                    if guesses <= 5 :
    print( 'Try again.' )                print( 'Try again.' )
                                     else :
                                         print( 'No guesses left.' )
```

When making **comparisons** to **select** what should happen, you can also use these **operators** to **compare values**:

==   means **equal to**, "**the same as**"
!=   means **not equal to** , "**not the same as**"

Iteration means to carry out instructions **more than once**.
You can carry them out a certain, definite number of times using a **for** loop.

```
for loop in range( 1, 6 )  :
```

You can also carry out a sequence of instructions only while a certain condition holds **True**, using a **while** loop.

```
while messageToRead == True :
```