

A **Variable** is a memory location in RAM, with a name, the value of it may change as the program runs.

A **Constant** is memory location in RAM, with a unique identifier, the value of a constant remains the same during the running of a program.

An **array** is a memory location in RAM, that stores a collection of values of same data type under one name.

Initialising an array `students=["Ann","Jo","Bob",Sam"]`

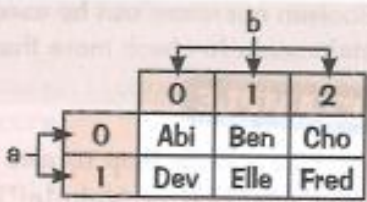
Command	Output
<code>print(students[0])</code>	<code>['Ann']</code>
<code>print (students[:3])</code>	<code>["Ann","Jo","Bob"]</code>
<code>Print(students[1:])</code>	<code>["Jo","Bob","Sam"]</code>
<code>print students[1:3]</code>	<code>["Jo","Bob"]</code>
<code>print (students[-1])</code>	Sam
<code>print (students[-2])</code>	Bob
<code>students.insert(2,"Hugo")</code> <code>print (students)</code>	<code>["Ann","Jo","Hugo","Bob",Sam"]</code>
<code>students.append("Billy")</code> <code>print (students)</code>	<code>["Ann","Jo","Hugo","Bob",Sam,"Billy"]</code>
<code>"Bob" in students</code>	True
<code>print (len(students))</code>	6
<code>students.remove("Bob")</code> <code>print (students)</code>	<code>["Ann","Jo","Hugo",Sam,"Billy"]</code>
<code>students.reverse()</code> <code>print (students)</code>	<code>["Billy","Sam","Hogo", "Jo", "Ann"]</code>
<code>students.sort()</code> <code>print (students)</code>	<code>["Ann","Billy","Hugo","Jo","Sam"]</code>
<code>students.count("Jo")</code>	1

Initialise an array called fruits

Two-Dimensional Arrays

A 2D array is like a table. You can also think of them as a 1D array where each element is a 1D array.

Positions of elements are written like `[a, b]` or `[a][b]`.



EXAMPLE

The 2D array 'runs' is used to store the number of runs scored by two cricketers in their last four matches. E.g. `runs[2, 0]` returns 65.

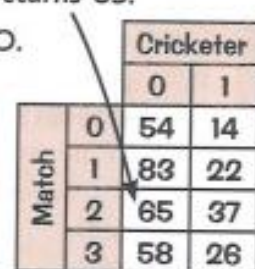
Write an algorithm to set all values in the array back to 0.

The i FOR loop goes through the 4 rows.

The j FOR loop goes through the 2 columns.

```

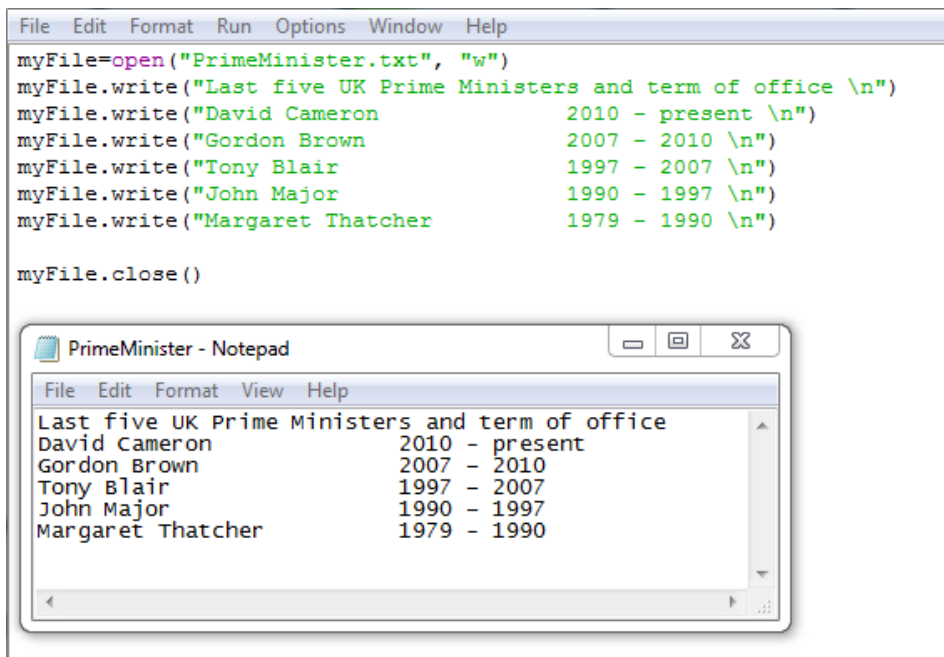
for i = 0 to 3
  for j = 0 to 1
    runs[i, j] = 0
  next j
next i
                    
```



Python > Arrays and Files Exercise

File Handling

Create a text file in the current working directory that creates and stores the text file (*UKPrimeMinister.txt*) that shows a list of the last five prime ministers of the United Kingdom.



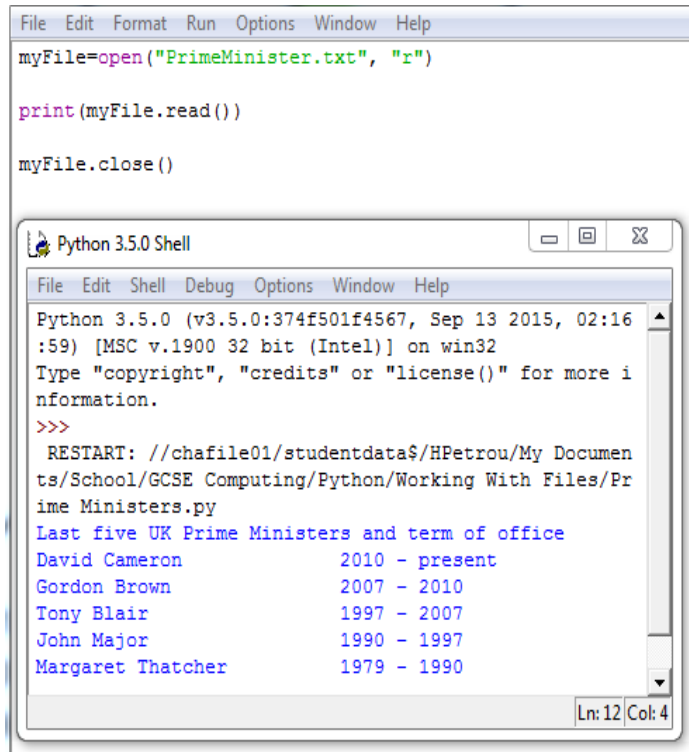
```
File Edit Format Run Options Window Help
myFile=open("PrimeMinister.txt", "w")
myFile.write("Last five UK Prime Ministers and term of office \n")
myFile.write("David Cameron          2010 - present \n")
myFile.write("Gordon Brown          2007 - 2010 \n")
myFile.write("Tony Blair          1997 - 2007 \n")
myFile.write("John Major          1990 - 1997 \n")
myFile.write("Margaret Thatcher    1979 - 1990 \n")

myFile.close()
```

PrimeMinister - Notepad

```
File Edit Format View Help
Last five UK Prime Ministers and term of office
David Cameron          2010 - present
Gordon Brown          2007 - 2010
Tony Blair          1997 - 2007
John Major          1990 - 1997
Margaret Thatcher    1979 - 1990
```

Now write a program that will read the file called *UKPrimeMinister.txt* and print the content to the screen.



```
File Edit Format Run Options Window Help
myFile=open("PrimeMinister.txt", "r")

print(myFile.read())

myFile.close()
```

Python 3.5.0 Shell

```
File Edit Shell Debug Options Window Help
Python 3.5.0 (v3.5.0:374f501f4567, Sep 13 2015, 02:16
:59) [MSC v.1900 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more i
nformation.
>>>
RESTART: //chafile01/studentdata$/HPetrou/My Documen
ts/School/GCSE Computing/Python/Working With Files/Pr
ime Ministers.py
Last five UK Prime Ministers and term of office
David Cameron          2010 - present
Gordon Brown          2007 - 2010
Tony Blair          1997 - 2007
John Major          1990 - 1997
Margaret Thatcher    1979 - 1990
Ln:12 Col:4
```

Amend the program code, so that the program reads and prints one line at a time using a *for* loop.

```
>>>
RESTART: //chafile01/studentdata$/HPetrou/My Documen
thon/Working With Files/Prime Ministers.py
Last five UK Prime Ministers and term of office

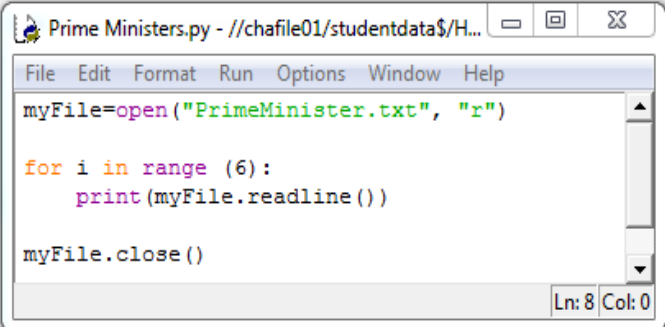
David Cameron          2010 - present

Gordon Brown          2007 - 2010

Tony Blair          1997 - 2007

John Major          1990 - 1997

Margaret Thatcher    1979 - 1990
```



```
Prime Ministers.py - //chafile01/studentdata$/H...
File Edit Format Run Options Window Help
myFile=open("PrimeMinister.txt", "r")

for i in range (6):
    print(myFile.readline())

myFile.close()
Ln: 8 Col: 0
```