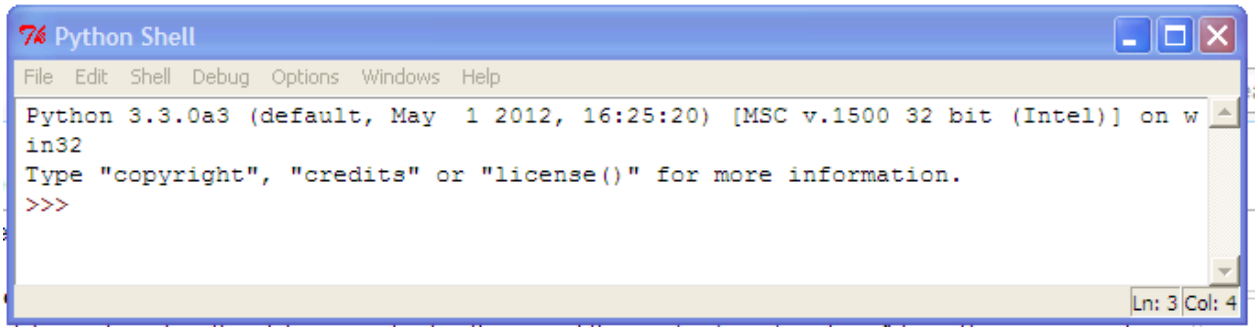
# Python - Getting Started

## Introduction to Python

- Python is a programming language, which is easy to learn even for the beginners.
- The latest version of Python is Python 3.9 which can be freely downloaded from official website of Python www.Python.org
- Once installed, go to the start menu, find Python, and run the program labeled '**IDLE**' (Stands for Integrated DeveLopment Environment).

When it opens, it looks something like following.




Now you are in the IDLE environment. This is the place where you will be spending most time in. ">>>" is known as the prompt which is the starting point of your commands.

- Python IDLE is a Computer program which is used to develop python programs
- You can also use mobile applications such as Qpython3 to run python commands
- https://www.python.org/shell/ provides an online shell for this exercise

## Exercise 01: Hello world Example

- Open Python IDLE or Qpython3 or online shell then type print('Hello World') and press enter:

```
>>> print('Hello World')
Hello World
```

✓ You just identified ……., …… …….. , …….. In python shell.

## Exercise 02: Case sensitivity

- Try each of the following python code and observe the output.

| Python Command (විධානය) | Output (ප්‍රතිඵලය) |
|---|---|
| `>>> print('Hello World')` | |
| `>>> print("Hello World")` | |

| | |
|---|---|
| >>> print("HELLO WORLD") | |
| >>> Print('Hello World') | |

✓ You just learnt that print() is a …… Which is used to print a message on the screen

✓ Python is a …….. programming language

- Modify >>> print('Hello World') to print your name on the screen.

## Exercise 03: Python as a Calculator

- Try following commands and fill the table with your results

| Command | Name | Examples | Output |
|---|---|---|---|
| + | Addition | 14+5<br>14+5.2 | |
| - | Subtraction | 48-5<br>48-5.0 | |
| * | Multiplication | 4*15 | |
| / | Division | 19/2<br>6/1 | |
| // | Quotient | 19//7<br>1//1<br>0//1 | |
| % | Remainder | 19%7<br>1%1<br>0%1 | |
| ** | Exponent | 2**4<br>25**0.5 | |

✓ Python has seven ……..

## Exercise 04:

- Write down the suitable Python commands to calculate following expressions. Also obtain the result of each operation

| Expression | Python Command | Result |
|---|---|---|
| 234+543 | 234+543 | |
| 234*23-34 | | |
| 123/34 | | |
| Remainder of 3940/31 | 3930%31 | |

| | | |
|---|---|---|
| Quotient of 1234/23 | 1234//23 | |
| $2^{12}$ | | |
| (12+34)/23 | | |
| $\frac{12}{3*2}$ | 12/(3*2) | |
| $(4^5 - 5^3) + 23$ | | |
| 12+34/23-3 | 12+34/23-3 | |
| Remainder of $\frac{7^{11}+48}{8^7}$ | (7**11+48)%(8**7) | |

✓ Brackets (parenthesis) can be used as usual to maintain the order of calculations.

## Exercise 05: Integers and Floats

- Try following python command and observe the outputs

```
>>> 5
>>> 5.0
>>> 4+1
>>> 6-1
>>> 4+1.0
>>> 4.1+0.9
```

```
>>> 5*1
>>> 5*1.0
>>> 5/1
>>> 5/1.0
>>> 6//2
>>> 6//2.0
```

✓ Python has two numeric data types. They are …… and ……. ……..…… numbers.

✓ The result of division is always ……..

✓ In other operations, If at least one of the operands is floating point then the result is also ……

## Exercise 06: int(), float() and round() Functions

| Function | Operation | Example | Output |
|---|---|---|---|
| **int(x)** | | `int(6.7)`<br>`int(6.1)`<br>`int(22/7)` | |
| **float(x)** | | `float(6)`<br>`float(276)` | |
| **round(x,n)** | | `round(22/7,4)`<br>`round(2/3,4)`<br>`round(1/3,4)`<br>`round(2/3)` | |

## Exercise 07:

- Write down the suitable Python commands to perform each of the following operations

| Operation | Python Command |
|---|---|
| 1/3 up to 3 decimal places | |
| 2/3 up to 4 decimal places | |
| 22/7 to nearest integer | |
| Integer part of (131/34) | |

## Exercise 08: Math Library

- Python has a lot of libraries for additional supports. Try following coding to find value of pi accuracy up to 15 decimal places

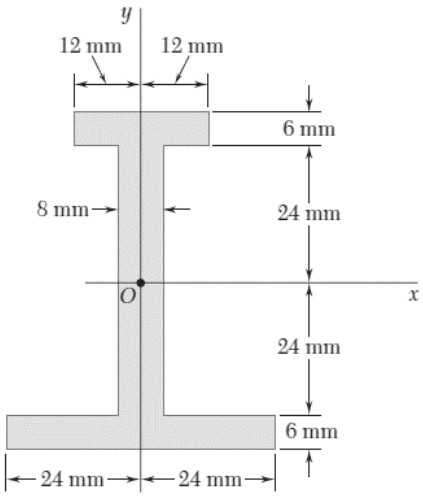
```
>>> import math
>>> math.pi
3.141592653589793
```

| Command | Description |
|---|---|
| **math.pi** | An approximation of pi |
| **math.e** | An approximation of the base of the natural logarithm. |
| **math.fabs(x)** | Returns the absolute value of x. |
| **math.factorial(x)** | Returns x factorial, which is 1 * 2 * 3 * ... *x. |
| **math.exp(x)** | Returns $e^x$. |
| **math.log(x)** | Returns ln(x). |
| **math.log(x, base)** | Returns $\log_{base}(x)$. |
| **math.sqrt(x)** | Returns the square root of x. |
| **math.cos(x)** | Returns the cosine of x radians. |
| **math.sin(x)** | Returns the sine of x radians. |
| **math.tan(x)** | Returns the tangent of x radians. |

- Calculate the value by using math library.
  - $e^{10}$
  - $132!$
  - $e^{\pi}$
  - ${}^{17}C_{12}$

✓ You just learnt, usage of a ……..…….....

## Exercise 09: Calculate $A, C(\bar{x}, \bar{y}), I_x, I_y$ and $I_{xy}$ of the plane area given.




## Exercise 10: pythonanywhere.com

Create a pythonanywhere.com user account, try some coding examples, add **asanka** as your teacher, and share your code for exercise 8 with your teacher.