

PYTHON BASIC PROGRAMS

Quick Notes & Practical Programs

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1. Sum of Two Numbers

→ Accepts two numbers from the user and calculates their sum.

Python Code

```
# Program to find the sum of two numbers
a = int(input("Enter value of a: "))
b = int(input("Enter value of b: "))
c = a + b
print("Sum of given two numbers is:", c)
```

How It Works

input() gets values, int() converts them to integers, + performs addition, and print() displays the result.

► Sample Output

```
Enter value of a: 25
Enter value of b: 15
Sum of given two numbers is: 40
```

...

2. Area of a Square

→ Accepts the side length of a square and calculates its area.

Python Code

```
# Program to find the area of a square
L = int(input("Enter length of square L: "))
area = L * L
print("Area of square is:", area)
```

Formula

$\text{Area} = L \times L$

How It Works

The area is calculated by multiplying the side length by itself.

► Sample Output

```
Enter length of square L: 12
Area of square is: 144
```

...

3. Area of a Rectangle

→ Accepts the length and breadth of a rectangle and calculates its area.

Python Code

```
# Program to find the area of a rectangle
a = int(input("Enter side length a: "))
b = int(input("Enter side length b: "))
area = a * b
print("Area of rectangle is:", area)
```

Formula

$\text{Area} = \text{Length} \times \text{Breadth}$

How It Works

Here a represents the length and b represents the breadth; $a * b$ gives the area.

► Sample Output

```
Enter side length a: 8
Enter side length b: 5
Area of rectangle is: 40
```

...

4. Area of a Triangle Using Heron's Formula

→ Calculates the area of a triangle when all three side lengths are known.

Python Code

```
# Program to find the area of a triangle using Heron's Formula
import math
a = float(input("Enter side a: "))
b = float(input("Enter side b: "))
c = float(input("Enter side c: "))
s = (a + b + c) / 2
area = math.sqrt(s * (s - a) * (s - b) * (s - c))
print(f"Area of triangle is: {area:.2f}")
```

Formula

$s = (a + b + c) / 2$
 $\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$

How It Works

`float()` allows decimal side lengths. `math.sqrt()` calculates the square root. The result is formatted to two decimal places.

► Sample Output

```
Enter side a: 5
Enter side b: 8
Enter side c: 10
Area of triangle is: 19.81
```

...

5. Area and Perimeter of a Square

→ Calculates both the area and perimeter of a square from its side length.

Python Code

```
# Program to find the area and perimeter of a square
L = int(input("Enter length of a square L: "))
A = L * L
P = 4 * L
print("Area =", A)
print("Perimeter =", P)
```

Formula

$\text{Area} = L \times L$
 $\text{Perimeter} = 4 \times L$

How It Works

The program uses two expressions: `L * L` for area and `4 * L` for perimeter.

► Sample Output

```
Enter length of a square L: 8
Area = 64
Perimeter = 32
```

...

6. Average of Three Numbers

→ Accepts three numbers and calculates their average.

Python Code

```
# Program to calculate the average of three numbers
A = float(input("Enter value of A: "))
B = float(input("Enter value of B: "))
C = float(input("Enter value of C: "))
average = (A + B + C) / 3
print("Average of given 3 numbers is:", average)
```

Formula

Average = $(A + B + C) \div 3$

How It Works

float() is used because an average can be a decimal value.

► Sample Output

```
Enter value of A: 10
Enter value of B: 20
Enter value of C: 30
Average of given 3 numbers is: 20.0
```

...

7. Greatest of Two Numbers

→ Compares two numbers and displays which one is greater.

Python Code

```
# Program to find the greatest of two numbers
A = int(input("Enter value of A: "))
B = int(input("Enter value of B: "))
if A > B:
    print("A is Larger")
else:
    print("B is Larger")
```

Key Logic

If $A > B \rightarrow A$ is larger
Otherwise $\rightarrow B$ is larger

How It Works

This program introduces if-else decision making. The statements inside the if and else blocks are indented.

► Sample Output

```
Enter value of A: 25
Enter value of B: 18
A is Larger
```

...

8. Swap Two Numbers Using a Temporary Variable

→ Swaps the values of two numbers using an extra temporary variable.

Python Code

```
# Program to swap two numbers using a temporary variable
a = int(input("Enter value of a: "))
b = int(input("Enter value of b: "))
c = a
a = b
```

```
b = c
print("Values of a & b after swapping:")
print("a =", a)
print("b =", b)
```

Key Logic

c = a → save the original value of a
a = b → put b into a
b = c → put the saved value into b

How It Works

The temporary variable c stores the original value of a so that it is not lost during the swap.

► Sample Output

```
Enter value of a: 15
Enter value of b: 25
Values of a & b after swapping:
a = 25
b = 15
```

...

9. Swap Two Numbers Without a Temporary Variable

→ Uses Python's multiple assignment feature to swap two values without an extra variable.

Python Code

```
# Program to swap two numbers without a temporary variable
a = int(input("Enter value of a: "))
b = int(input("Enter value of b: "))
a, b = b, a
print("Values of a & b after swapping:")
print("a =", a)
print("b =", b)
```

Key Logic

a, b = b, a

How It Works

Python exchanges the two values in a single statement using multiple assignment.

► Sample Output

```
Enter value of a: 15
Enter value of b: 25
Values of a & b after swapping:
a = 25
b = 15
```

...

10. Calculate Simple Interest

→ Calculates Simple Interest using the principal amount, number of years, and rate of interest.



Python Code

```
# Program to calculate Simple Interest
P = float(input("Enter Principal Amount (P): "))
N = float(input("Enter Number of Years (N): "))
R = float(input("Enter Rate of Interest (R): "))
SI = (P * N * R) / 100
print(f"Simple Interest is: {SI:.2f}")
```



Formula

$$SI = (P \times N \times R) / 100$$

P = Principal, N = Number of Years, R = Rate of Interest



How It Works

float() allows decimal input, and :.2f displays the calculated interest with two decimal places.

► Sample Output

```
Enter Principal Amount (P): 10000
Enter Number of Years (N): 2
Enter Rate of Interest (R): 8
Simple Interest is: 1600.00
```

...

11. Convert Fahrenheit to Celsius

→ Converts a temperature from Fahrenheit to Celsius.



Python Code

```
# Program to convert Fahrenheit to Celsius
F = float(input("Enter temperature in Fahrenheit: "))
C = (F - 32) * 5 / 9
print(f"Temperature in Celsius is: {C:.2f}")
```



Formula

$$\text{Celsius} = (\text{Fahrenheit} - 32) \times 5 / 9$$



How It Works

float() allows decimal temperatures such as 98.6. The :.2f format displays the result to two decimal places.

► Sample Output

```
Enter temperature in Fahrenheit: 98.6
Temperature in Celsius is: 37.00
```

...

Quick Revision

Remember These

- `input()` → accepts user input
- `int()` → converts input to an integer
- `float()` → converts input to a floating-point number
- `+`, `-`, `*`, `/` → basic arithmetic operators
- `if` / `else` → decision making
- `math.sqrt()` → square root
- `a, b = b, a` → swaps two values without a temporary variable
- `f" {value:.2f}"` → displays a number with two decimal places

 **Happy Coding! • Keep Learning • Keep Building • Keep Exploring**



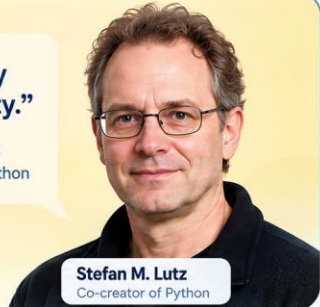
"Beautiful is better than ugly."
— Guido van Rossum
Creator of Python

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Happy Coding!

Keep Learning • Keep Practicing • Keep Growing



"Practicality beats purity."
— Stefan M. Lutz
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