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Batch – C2

Exp 1: Write programs to demonstrate variables, data types, operators, and type casting in Python.

1. Create variables to store your name, age, height, and whether you are a student. Print all variables and their data types.

```
name = "Abhishek"
age = 21
height = 166.5
student = True print(name,
type(name)) print(age,
type(age)) print(height,
type(height)) print(student,
type(student))
# Output:
#Abhishek <class 'str'>
# 21 <class 'int'>
# 166.5 <class 'float'>
# True <class 'bool'>
```

2. Take two integer inputs from the user and perform addition, subtraction, multiplication, division, floor division, modulus, and exponentiation. Print the results.

```
a = int(input()) b =
int(input()) print("Sum :
", a + b) print("Diff : ", a
- b) print("Div : ", a / b)
print("Multi : ", a * b)
print("Mod : ", a % b)
print("Expo : ", a ** b)
print("floor div : ", a // b)
# Input:
# 12 # 5
# Output:
# Sum : 17
# Diff : 7
# Div : 2.4
# Multi : 60
# Mod : 2
# Expo : 248832
# floor div : 2
```

3. Take two numbers as input and compare them using all comparison operators (>, <, ==, !=, >=, <=). Print the boolean results.

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```
a = int(input("a : ")) b
= int(input("b : "))
print(a > b)
print(a < b)
print(a == b)
print(a != b)
print(a >= b)
print(a <= b) #
Output:
# True
# False
# False
# True
# True
# False
```

4. Check logical operators: Create two boolean variables and apply and, or, and not operators. Print the results.

```
a = True b = False
print("AND : ", a and b)
print("OR : ", a or b)
print("NOT : ", not b)
print("NOT : ", not a) #
Output:
# AND :  False
# OR :  True
# NOT :  True
# NOT :  False
```

5. Type casting from string to integer and float: Take a numeric string from the user, convert it to integer and float, and print their types.

```
a = input() b
= int(a)
c = float(a)

print(a, type(a))
print(b, type(b))
print(c, type(c))
# Input: 123 #
Output:
# 123 <class 'str'>
# 123 <class 'int'>
# 123.0 <class 'float'>
```

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6. Type casting from float to integer: Take a float input from the user and convert it to an integer. Print both values and types.

```
a = 12.34 b
= int(a)
print(a,
type(a))
print(b,
type(b)) #
Output:
# 12.34 <class 'float'>
# 12 <class 'int'>
```

7. Type casting from integer to string: Take an integer input and convert it to a string. Print the result and its type.

```
a = int(input("a : ")) b
= str(a)

print(a, type(a))
print(b, type(b))
# Input: 43 #
Output:
# 43 <class 'int'>
# 43 <class 'str'>
```

8. Perform arithmetic operations on variables of different data types (int + float, int + string after casting, etc.) and print results.

```
a = "12"
b = 12.45
c = 11

print(b + c)
print(c + int(a)) #
Output:
# 23.45
# 23
```

9. Swap two numbers using a temporary variable and print the result before and after swapping.

```
a = 1
b = 0
print("Before swapping, a : ", a)
print("Before swapping, b : ", b)
c = a a = b b = c
```

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```
print("After swapping, a : ", a)
print("After swapping, b : ", b)
# Output:
# Before swapping, a :  1
# Before swapping, b :  0
# After swapping, a :  0
# After swapping, b :  1
```

10. Use input to calculate the area of a rectangle: Take length and width as input, calculate area, and print. Ensure inputs are properly converted to float.

```
a = float(input())
b = float(input())

area = a * b print("Area
is : ", area) # Input:
# 23.4
# 44.1 #
Output:
# Area is :  1031.94
```

11. Calculate the average of three numbers entered by the user. Use type casting if necessary.

```
a = float(input("a : ")) b
= float(input("b : "))
c = float(input("c : "))

avg = (a + b + c) / 3
print("Average : ", avg) #
Input:
# a : 2.3
# b : 4.1 #
c : 1.6
# Output:
# Average :  2.6666666666666665
```

12. Convert temperature: Take temperature in Celsius as input and convert it to Fahrenheit. Print both values.

```
cel = 233.1
fah = (cel * 1.8) + 32
```

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```
print("Fahrenheit : ", fah) #
```
Output:
Fahrenheit : 451.58

13. Check if a number is even or odd using the modulus operator and print the result.

```
a = int(input("a : ")) if a % 2 == 0:     print("Even")
  else:
   print("Odd") #
```
Input: 4
Output: Even

14. Perform a series of calculations: Take two numbers, calculate sum, difference, product, quotient, and remainder. Then cast all results to strings and print them concatenated in a single sentence.

```
a = int(input("a : "))
b = int(input("b : "))

sum = a + b
diff = a - b
pro = a * b
quo = a / b
rem = a % b

print(str(sum) + " " + str(diff) + " " + str(pro) + " " + str(quo) + " " + str(rem)) #
```
Input:
a : 12
b : 2
Output:
14 10 24 6.0 0

15. User input for personal details: Take name, age, and height as input, cast age to int and height to float, and print a formatted string showing all details.

```
 name = input("Name : ") age
= input("Age : ")
h = input("Height : ")

print(f"\n\nName : {name}\nAge : {int(age)}\nHeight : {float(h)}") #
```
Input:
Name :Arjun
Age : 21
Height : 166.2
Output:
Name :Arjun
Age : 21
Height : 166.2