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PYTHON HANDOUT

Welcome to the world of Python programming! Python is one of the easiest programming languages to learn and is used by professionals in many industries, from web development to artificial intelligence.

Let's dive into the basics and learn how to code in Python.

What is Python?

- Python is a high-level programming language.
- It is known for its simplicity and readability.
- Python is widely used for creating games, websites, apps, and even robots!

Why Learn Python?

1. **Easy to Understand**: Python uses simple words and symbols, making it beginner-friendly.
2. **Powerful**: Python can be used for small tasks as well as big projects.
3. **Popular**: Learning Python opens up many opportunities as it is one of the most in-demand programming languages.

Program Requirements:

Before you run a program, you need to know the program requirements. The requirements tell you what the program is expected to do. A programmer makes sure that the code meets the requirements.

Programming:
Programming is writing a computer code to solve a particular problem.

Programming Language:
A Programming Language has a set of instructions, keywords and a syntax. Examples are Python, C++, Java etc.

Operators:
Operators are symbols and terms used in programming. Operators are used to change values. Arithmetic operators are used to perform mathematical calculations. For example add,multiply,divide and subtract. (+,*,/,-)

Algorithm:
An algorithm is a plan to solve a problem. It is the sequence of steps needed to perform a specific task.

Syntax:
Syntax is specific rules and structure used for writing code in a particular programming language.

Interface:
An interface is how the user interacts with the program. Every program has an interface. It allows the user to enter the inputs and provides the outputs.

Variable & Constants:
A variable is a value that can change while a constant is a fixed value.

Data type:
A data type is the type of value that can be stored in a computer program. There are three main data types namely integers(whole numbers), float(decimal numbers) and string(text).

Colors in Python programming:

- Variables shown in black color
- print/input is in purple
- String is in green
- Error is in red

- Output is in blue

Remainder or Modulus operator:
% is the remainder or modulus operator. This operator returns the number left over when a number is divided by another number.

Difference between Source Code and Machine Code

Source Code	**Machine Code**
Commands written in a programming language that is in a human readable form is called a source code. It needs to be translated into binary instructions for a computer to understand.	Machine Code is another name for binary code. It is in a form which is directly understood by the computer. It does not need to be translated. It consists of 0s and 1s. Human beings cannot understand it.

Difference between Compiling and Compiler

Compiling	**Compiler**
Compiling is the process of translating a source code into machine code. It converts a program written in a programming language to an executable file.	A Compiler is a software that is used to translate source code into machine code. It compiles a program and converts it into an executable file.

Difference between a program and a command

Program	**Command**
A program is a set of instructions or commands given to the computer to perform a particular task.	A single instruction given to the computer is called a command

Conditional Structure:
A conditional structure also known as a decision structure is a programming construct that allows you to execute a sequence of code based on whether a set of given conditions are met or not. A conditional structure statement in python always ends with a colon.

Logical Test:
A logical test usually compares two values. The result of a logical test can be true or false. It uses relational operators to compare the two values.

Relational Operators:
The relational operators are used to compare two values to understand what relationship the pairs of values share. For example, equal to, greater than, less than, etc. <, >, <=,>=,!=,==

Keywords:
Keywords are predefined, reserved words used in programming that have special meanings to the compiler. Keywords are part of the syntax and they cannot be used as a variable name.

Exit Condition:
Every Loop has an exit condition. An exit condition is how you stop the loop.

Counter Loop:
A counter loop or a fixed loop repeats a set of instructions a number of times then stops.

Conditional Loop:
A conditional loop repeats a set of instructions until a specific condition is true. It is controlled by a logical test.

Syntax Errors:
Every programming language has rules. The specific rules that define the structure of a programming language is called syntax.If you break the rules of a programming language, you make a syntax error. The syntax errors are identified when you

Translating:
The computer turns the commands into machine code

Running:
The computer executes the machine code commands

Indentation in Python:
In Python, you must indent each line of code by the same amount of spaces to indicate a block of code. Python usually adds indentation automatically with a conditional structure. If you skip indentation, Python compiler usually gives an error message ”expected an indented block”

Logical Errors:
A logical error means that the logic of the program is wrong. The program runs but it does not perform the required task properly.

Interface:
It is the part of the program that allows the user to interact with the program. The interface allows the user to enter inputs and it provides output.

Readable Program:
It is a program that is easy for other programmers to read and understand-used to describe program code. Two things that make a program easy to read are:
- Well-chosen variable names that are relevant to the program
- Clear Comments given explaining each step of program

Chapter 3 programs
Simple I/O codes

Q1. Create a program that asks the user to input 4 numbers, add the first two numbers, multiply the third number and divide by the fourth number. Display the answer.

Solution:
```
number1=input(“Enter first number”)
number1=int(number1)
number2=input(“Enter second number”)
number2=int(number2)
number3=input(“Enter third number”)
number3=int(number3)
number4=input(“Enter fourth number”)
number4=int(number4)
sum=number1+number2
product=sum*number3
```

```
div=product/number4
print(div)
```

Q2. Create a program of three variables num1 ,num2 and num3 having values 60, 40 and 100. Find the addition of the first two numbers and subtract the third number. Display "the answer is" answer.

Solution:

```
num1=input("enter a number")
num1=60
num2=input("enter a number")
num2=40
num3=input("enter a number")
num3=100
Answer=num1+num2-num3
print("the answer is", Answer)
```

Q3. Enter a number and convert it into an integer value.

Solution :

```
number=input("enter a number")
number=int(number)
```

Q4. Enter a number and convert it into a float value.

```
number=input("enter a number")
number=float(number)
```

Q5 Ask the user to enter an email and assign the value "abcd@yahoo.com". Display your email is <email>. Ask the user to enter password and assign value"ABCD", ask user to please confirm your password. Display account created successfully.

Solution:

```
email=input("enter email")
email="abcd@yahoo.com"
print("your email is",email)
password1=input("enter your password")
password1="ABCD"
password2=input("confirm your password")
print("account created successfully")
```

Q6. Create a program that asks the user to enter 2 numbers. Multiply the first number by 5 and display the answer. Divide the second number by 2 and display the answer.

Solution:

```
num1=input("enter a number")
num1=int(num1)
num2=input("enter another number")
num2=int(num2)
ans1=num1*5
print("the answer is",ans1)
ans2=num2/2
print("the second answer is",ans2)
```

Q7. Create a program that asks the user to enter length and width. Calculate the area and display the answer in the form "the area is" <area>.

Solution :

```
length=input("enter length")
width=input("enter width")
length=int(length)
width=int(width)
area=length*width
print(" the area is",area)
```

Q8. Create a program that asks the user to enter a number. Multiply the number by 20 and subtract 100. Display the answer in the form "the answer is", <answer>.

Solution :

```
num1=input("enter a number")
num1=int(num1)
answer=num1*20-100
print("the answer is",answer)
```

Q9. Create a program that asks the user to enter 2 numbers. Divide the first number by the second number. Display the answer in the form "answer of dividing no1 by no2 is" <answer>.

Solution :

```
num1=input("enter a number")
num1=int(num1)
num2=input("enter another number")
num2=int(num2)
```

```
answer=num1/num2
print("answer of dividing num1 by num2 is",answer)
```

Q10. Create a program that asks the user to enter 2 numbers having value 60 and 75. Multiply the numbers and display the answer in the form "the answer is" <answer>.

```
num1=input("enter a number")
num1=60
num2=input("enter another number")
num2=75
answer=num1*num2
print("the answer is",answer)
```

Q11. Create 2 variables and assign them the values of 234 and 65. Add them.Display the result in float data type.

```
Num1=234
Num2=65
Result=Num1+Num2
Result=float(Result)
print(Result)
```

Q12. Display the following pattern using python commands.

#########

WELCOME EVERYONE

2024

****

Solution:

```
print("#"*9)
print("\n")
print("WELCOME EVERYONE")
print("\n")
print(2024)
print("*"*11)
```

Q13. Write the python commands for the following:-

1. **create a variable month and assign it a value “march”. Display the month.**
   month=”march”
   print(month)
2. **display the “ mobile_network”**
   Print(“mobile_network”)
3. **create a variable digit ,assign it a value 750. Add 100 to the digit and divide it by 10. Display the result.**
   digit=750
   sum=digit+100
   div=sum/10
   print(div)
4. **display 78945**
   print(78945)
5. **display “ have a good day” and variable school.**
   print(“have a good day”)
   print(school)
6. **Make a variable called city with the value “Paris”**
   city=”Paris”
7. **Output the variable age**
   print(age)
8. **Ask the user “How old are you”, get user input and store the user input as the variable age.**
   age=input(“How old are you”)
9. **Assign the value 9.99 to a float data type variable called price**
   price=9.99
10. **Declare a variable called points and increase its value by 10**
    points=points+10
11. **Write a print statement to leave a line space**
    print(“\n”)
12. **Write a print statement to display this output “@” 10 times**
    print(“@” *10)

Chapter:4 Programs
If-Else statement, For Loop

Q1.Create a program that enters 2 numbers having values 100 and 60. Ask the user ("do you want to add? (Y/N)") if it is yes then add the two numbers else subtract the numbers and display the result.

Solution:

```
Num1=100
Num2=60
answer =input ("do you want to add? (Y/N)")
if  answer== "Y":
        result=Num1+Num2
else:
        result=Num1-Num2
        print(result)
```

Q2. Create a program that enters 2 numbers having values 40 and 80. Ask the user ("do you want to multiply? (Y/N)") if it is yes then multiply the two numbers else divide the numbers and display the result.

Solution:

```
Num1=40
Num2=80
answer =input ("do you want to MULTIPLY? (Y/N)")
if  answer== "Y":
        result=Num1*Num2
else:
        result=Num1/Num2
        print(result)
```

Q3. Take input of 2 numbers having values 500 and 250. Ask the user whether he would like to add the numbers. If the answer is yes then, add the 2 numbers else subtract the 2 numbers. Display the answer.

Solution:

```
Num1=input(“enter number”)
Num2=input(“enter number”)
Num1=500
Num2=250
Question=input(“would you like to add the numbers”)
if Question==”yes”:
        ans=Num1+Num2
else:
        ans=Num1-Num2
        print(ans)
```

Q4. Take input of 2 numbers having values 500 and 250. Ask the user whether he would like to add the numbers. If the answer is yes then, add the 2 numbers else subtract the 2 numbers. Display the answer.

Solution:

```
Num1=input(“enter number”)
Num2=input(“enter number”)
Num1=500
Num2=250
Question=input(“would you like to add the numbers”)
if Question==”yes”:
        ans=Num1+Num2
else:
        ans=Num1-Num2
        print(ans)
```

Q5. Take input of 2 numbers having values 500 and 250. Ask the user whether he would like to add the numbers. If the answer is yes then, add the 2 numbers else subtract the 2 numbers. Display the answer.

Solution:

```
Num1=input(“enter number”)
Num2=input(“enter number”)
Num1=500
Num2=250
Question=input(“would you like to add the numbers”)
```

```
if Question==”yes”:
        ans=Num1+Num2
else:
        ans=Num1-Num2
        print(ans)
```

Q6. Input 10 numbers and display the largest and smallest numbers.

Solution :

```
largest=0
smallest=0
for i in range(10):
        num=input(“enter a number”)
        num=int(num)
        if num>largest:
                largest=num
        if num<smallest:
                smallest=num
         print(“ The largest number is”,largest)
         print(“The smallest number is”,smallest)
```

Q7. Write a program where the user enters 10 numbers to each number, add 50 and display “the number is” and then the answer. Also display “the counter is” and then the counter. Use a for loop for this.

Solution :

```
total=0
for i in range(10):
        num=input(“enter a number”)
        num=int(num)
        total=num+50
        print(“the number is”,total)
        print(“the counter is”,i)
```

Q8. Create a program that asks the user to enter 2 numbers. Add the two numbers, repeat it 10 times and display the result.

Solution:

```
for i in range (10):
                num1=input(“enter a  number”)
                num2=input(“enter a number”)
                result=num1+num2
```

```
print(result)
```

Q9. Create a program that asks the user to enter 2 numbers with the values 50 and 38. Subtract the two numbers, repeat it 20 times and display the answer.

Solution:

```
for i in range (20):
    num1=input("enter a  number")
    num2=input("enter a number")
    num1=50
    num2=38
    answer=num1-num2
    print(answer)
```

Q10. Write a program where the user enters 10 numbers to each number, add 50 and display "the number is" and then the answer. Also display "the counter is" and then the counter. Use a for loop for this.

Solution :

```
total=0
for i in range(10):
    num=input("enter a number")
    num=int(num)
    total=num+50
    print("the number is",total)
    print("the counter is",i)
```

Q11. Create a program that asks the user to enter 2 numbers with the values 50 and 38. Subtract the two numbers, repeat it 20 times and display the answer.

Solution:

```
for i in range (20):
    num1=input("enter a  number")
    num2=input("enter a number")
    num1=50
    num2=38
    answer=num1-num2
    print(answer)
```

Q12. Create a program that takes 10 numbers input from user and displays the sum of the 10 numbers

Solution:

```
total=0
For i in range(10):
        number=input(“enter a number”)
        number=int(number)
        total=total+number
print(total)
```