ERRATA

Computer Science XI

Due to Printing eror, a few typographical mistakes occurred in this edition, please refer to the errata table below for corrections.

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Page No. 99

Figure 3.11 Simple Python Program

Incorrect

SimpleProgram.py X

SimpleProgram.py

```
1  # Tiju ju b ujornf P{viqp rtqhtbo
2  rtjpv("Hfnnq, Wqtne!·)
3  rtjpv("Wfndqof vq P{viqp·)
4  rtjpv(100)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS Python

Correct

SimpleProgram.py X

SimpleProgram.py

```
1  # This is a simple Python program
2  print("Hello, World!")
3  print("Welcome to Python")
4  print(100)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS Python

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Page No. 101

Figure 3.15 print() function syntax

Incorrect

```
# gqnnqyjph rtjpv gwpdvjqp vblfu qpn{ uvtjph ofuubhf
rtjpv("ofuubhf")

# gqnnqyjph rtjpv gwpdvjqp vblfu uvtjph ofuubhf bpe xbtjbcnf
rtjpv("ofuubhf",xbtjbcnf)

# gqnnqyjph rtjpv gwpdvjqp vblfu ownvjrnf uvtjph ofuubhf bpe xbtjbcnf
rtjpv("ofuubhf",xbtjbcnf1," ofuubhf ,xbtjbcnf2)

# gqnnqyjph rtjpv gwpdvjqp vblfu uvtjph ofuubhf yjvi xbtjbcnf pbofu~
rtjpv(g"ofuubhf }xbtjbcnfpbof  ofuubhf }xbtjbcnfpbof  )
```

Correct

```
# following print function takes only string message
print("message")

# following print function takes string message and variable
print("message",variable)

# following print function takes multiple string message and variable
print("message",variable1,"message",variable2)

# following print function takes string message with variable names|
print(f"message {variablename} message {variablename}")
```

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Page No. 102

Incorrect

Example 1: Printing multiple values:

```
pbof = ‡Anj·
bhf = 16
rtjpv(‡Nbof:·, pbof, ‡Ahf:·, bhf)
```

Example 2: Advance output using f-strings:

```
pbof = ‡Anj·
bhf = 16
rtjpv(g‡M{ pbof ju }pbof  bpe I bo }bhf  {fbtu qne.·)
```

```
M{ pbof ju Anj bpe I bo 16 {fbtu qne.
```

```
xbtjbcnf = jprwv(‡Ptqorv ofuubhf: ·)
```

Example 1 - taking name as input and print:

```
pbof = jprwv(‡Epvft {qwt pbof: ·)
rtjpv(‡Hfnnq,·, pbof)
```

Example 2 - taking numeric input and print:

```
bhf = jpv(jprwv(‡Epvft {qwt bhf: ·))  # converting input to integer
ifjhiv = gnqbv(jprwv(‡Epvft {qwt ifjhiv jp ofvftu: ·)) # converting input to float

rtjpv(‡Yqwt bhf ju·, bhf)
rtjpv(‡Yqwt ifjhiv ju·, ifjhiv)
```

Correct

Example 1: Printing multiple values:

```
name = “Ali”
age = 16
print(“Name:”, name, “Age:”, age)
```

Example 2: Advance output using f-strings:

```
name = “Ali”
age = 16
print(f“My name is {name} and I am {age} years old.”)
```

```
My name is Ali and I am 16 years old.
```

```
variable = input(“Prompt message: ”)
```

Example 1 - taking name as input and print:

```
name = input(“Enter your name: ”)
print(“Hello,”, name)
```

Example 2 - taking numeric input and print:

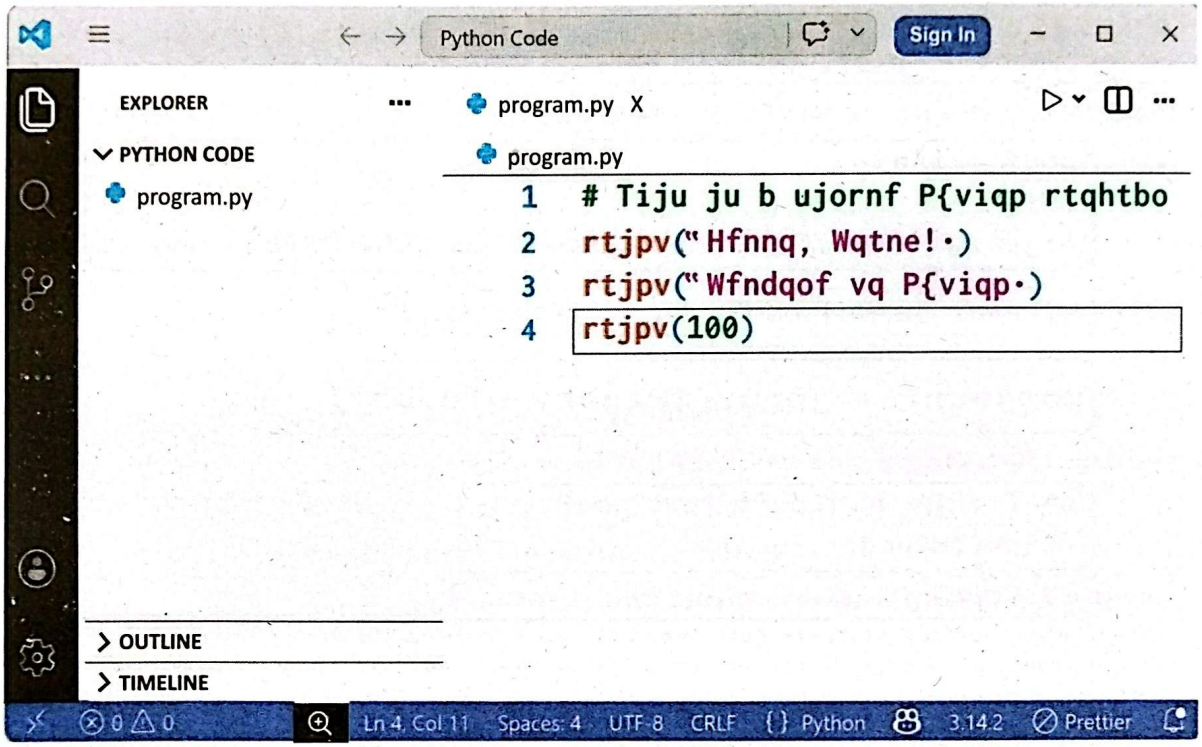
```
age = int(input(“Enter your age: ”))    # converting input to integer
height = float(input(“Enter your height in meters: ”))   # converting input to float

print(“Your age is”, age)
print(“Your height is”, height)
```


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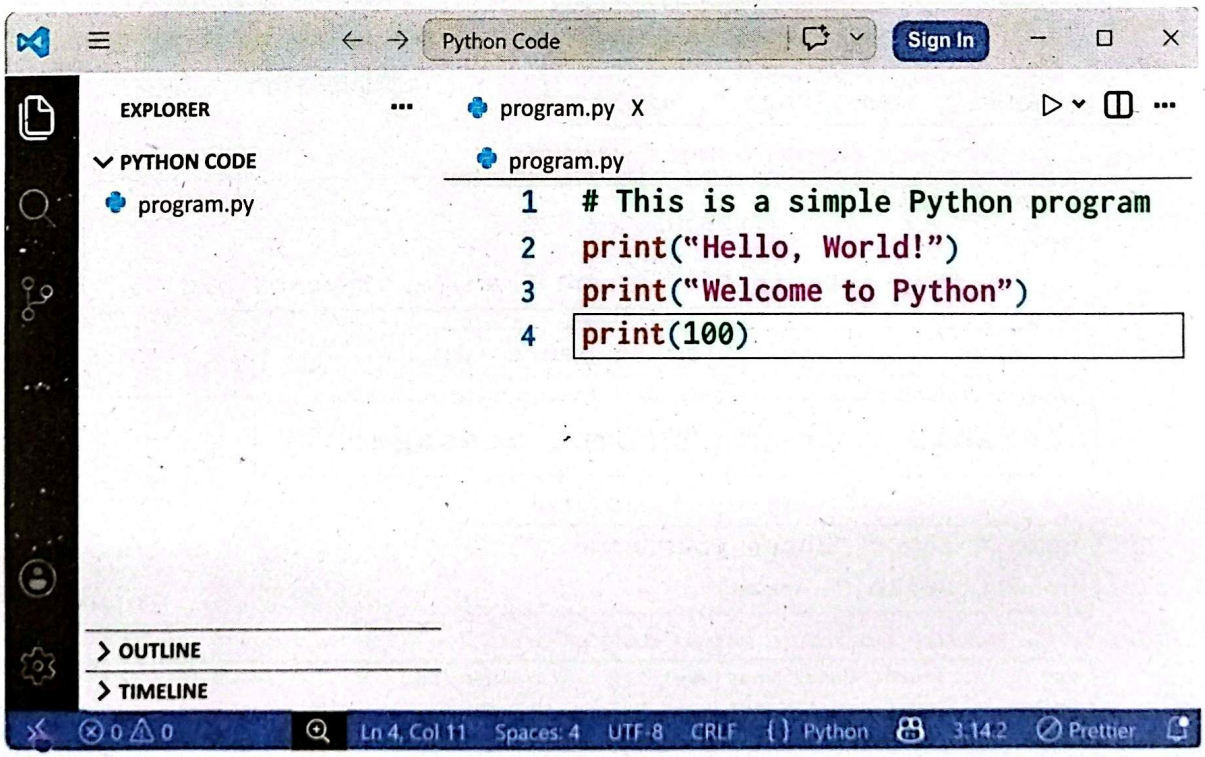
Page No. 103

Incorrect



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Correct

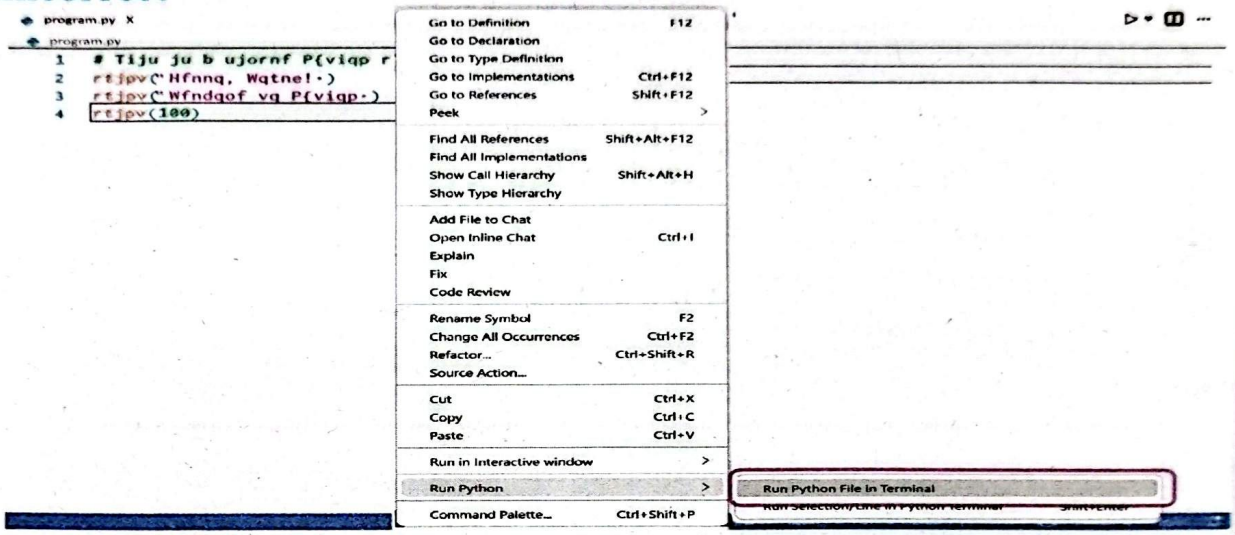


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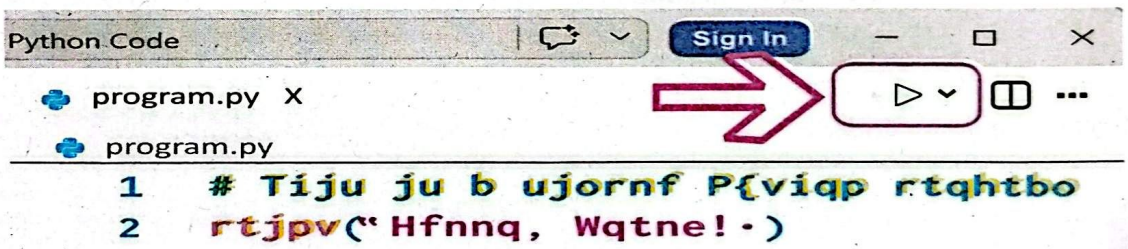
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Page No. 104

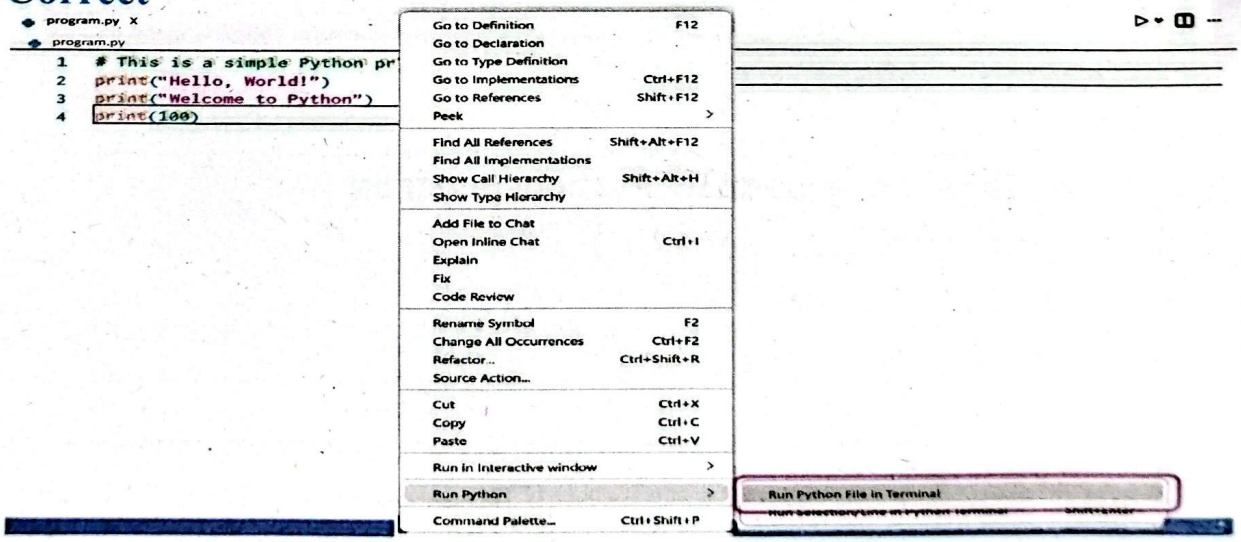
Incorrect



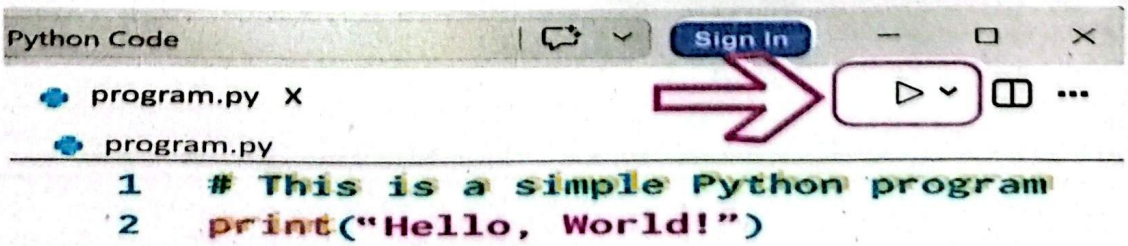
2) Click the **Play** button located at the top-right corner of the VS Code window to execute the program.



Correct



2) Click the **Play** button located at the top-right corner of the VS Code window to execute the program.



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Incorrect

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program.py X

program.py

```
1  # Tiju ju b ujornf P{viqp rtqhtbo
2  rtjpv("Hfnnq, Wqtne!·)
3  rtjpv("Wfndqof vq P{viqp·)
4  rtjpv(100)
```

TERMINAL

```
PS E:\Python Code> & "C:/Users/Hassan Zaidi/AppData/Local/Programs/Python/Python314/python.exe" "e:/Python Code/program.py"
Hello, World!
Welcome to Python
100
PS E:\Python Code>
```

Correct

program.py X

program.py

```
1  # This is a simple Python program
2  print("Hello, World!")
3  print("Welcome to Python")
4  print(100)
```

TERMINAL

```
PS E:\Python Code> & "C:/Users/Hassan Zaidi/AppData/Local/Programs/Python/Python314/python.exe" "e:/Python Code/program.py"
Hello, World!
Welcome to Python
100
PS E:\Python Code>
```


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Page No. 106

Incorrect

Code Example:

ArithmeticOperatorProgram.py

```
# Sjornf Atjviofvjd Orftbvjqp Ptqhtbo
b = 10
c = 3

rtjpv(g‡Aeejvjqp:  }b  + }c  =•,b + c)        # 13   → Aeejvjqp
rtjpv(g‡Swcvtbdvjqp:  }b  - }c  =•,b - c)     # 7    → Swcvtbdvjqp
rtjpv(g‡Mwnvjrnjdbvjqp:  }b  * }c  =•,b * c)  # 30   → Mwnvjrnjdbvjqp
rtjpv(g‡Djxjujqp:  }b  / }c  =•,b / c)        # 3.33 → Djxjujqp
rtjpv(g‡Fnqqt Djxjujqp:  }b  // }c  =•,b // c)# 3    → Fnqqt Djxjujqp
rtjpv(g‡Mqewnwu:  }b  % }c  =•,b % c)         # 1    → Mqewnwu
rtjpv(g‡Ezrqpfpv:  }b  ** }c  =•,b ** c)      # 1000 → Ezrqpfpv
```

TERMINAL

```
PS D:\P{viqp Cqef> & D:\Ptqhtbou\P{viqp\P{viqp314\r{viqp.fzf ‡e:/P{viqp Cqef/AtjviofvjdOrftbvqtPtqhtbo.r{•
Aeejvjqp:  10 + 3 = 13
Swcvtbdvjqp:  10 - 3 = 7
Mwnvjrnjdbvjqp:  10 * 3 = 30
Djxjujqp:  10 / 3 = 3.3333333333333335
Fnqqt Djxjujqp:  10 // 3 = 3
Mqewnwu:  10 % 3 = 1
Ezrqpfpv:  10 ** 3 = 1000
```

Correct

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Code Example:

ArithmeticOperatorProgram.py

```
# Simple Arithmetic Operation Program
a = 10
b = 3

print(f"Addition:  {a} + {b} =",a + b)          # 13   → Addition
print(f"Subtraction:  {a} - {b} =",a - b)       # 7    → Subtraction
print(f"Multiplication:  {a} * {b} =",a * b)    # 30   → Multiplication
print(f"Division:  {a} / {b} =",a / b)          # 3.33 → Division
print(f"Floor Division:  {a} // {b} =",a // b)  # 3    → Floor Division
print(f"Modulus:  {a} % {b} =",a % b)           # 1    → Modulus
print(f"Exponent:  {a} ** {b} =",a ** b)        # 1000 → Exponent
```

TERMINAL

```
PS D:\Python Code> & D:\Programs\Python\Python314\python.exe "d:/Python Code/ArithmeticOperatorProgram.py"
Addition:  10 + 3 = 13
Subtraction:  10 - 3 = 7
Multiplication:  10 * 3 = 30
Division:  10 / 3 = 3.3333333333333335
Floor Division:  10 // 3 = 3
Modulus:  10 % 3 = 1
Exponent:  10 ** 3 = 1000
```


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Page No. 107
Incorrect

Code Example:

AssignmentOperatorProgram.py

```
# Sjornf Auujhpofpv Orftbvjqp Ptqhtbo
b = 10          # Auujhp 10
rtjpv(b)
b += 5          # b = b + 5  → 15
rtjpv(b)
b -= 3          # b = b - 3  → 12
rtjpv(b)
b *= 2          # b = b * 2  → 24
rtjpv(b)
b /= 4          # b = b / 4  → 6.0
rtjpv(b)
b //= 2         # b = b // 2 → 3.0
rtjpv(b)
b **= 3         # b = b ** 3 → 27.0
rtjpv(b)
b %= 5          # b = b % 5  → 2.0
rtjpv(b)        # 2.0
```

Correct

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Code Example:

AssignmentOperatorProgram.py

```
# Simple Assignment Operation Program
a = 10          # Assign 10
print(a)
a += 5          # a = a + 5  → 15
print(a)
a -= 3          # a = a - 3  → 12
print(a)
a *= 2          # a = a * 2  → 24
print(a)
a /= 4          # a = a / 4  → 6.0
print(a)
a //= 2         # a = a // 2 → 3.0
print(a)
a **= 3         # a = a ** 3 → 27.0
print(a)
a %= 5          # a = a % 5  → 2.0
print(a)        # 2.0
```


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Incorrect

Example:

ComparisonOperatorProgram.py

```
# Sjornf Cqorbtjuqp Orftbvjqp Ptqhtbo
b = 10
c = 20

rtjpv(b == c)     # Fbnuf → Eswbn vq
rtjpv(b != c)     # Ttwf  → Nqv fswbn vq
rtjpv(b > c)      # Fbnuf → Gtfbvft vibp
rtjpv(b < c)      # Ttwf  → Lfuu vibp
rtjpv(b >= 10)    # Ttwf  → Gtfbvft qt fswbn
rtjpv(b <= 9)     # gbnuf → Lfuu qt fswbn
```

TERMINAL — Python

```
Fbnuf
Ttwf
Fbnuf
Ttwf
Ttwf
Fbnuf
```

Correct

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Example:

ComparisonOperatorProgram.py

```
# Simple Comparison Operation Program
a = 10
b = 20

print(a == b)     # False → Equal to
print(a != b)     # True  → Not equal to
print(a > b)      # False → Greater than
print(a < b)      # True  → Less than
print(a >= 10)    # True  → Greater or equal
print(a <= 9)     # false → Less or equal
```

TERMINAL — Python

```
False
True
False
True
True
False
```


CamScanner

Page No. 109

Incorrect

Example:

LogicalOperatorProgram.py

```
1  # Sjornf Lqhjdbn Orftbvqt Ptqhtbo
2  b = Ttwf
3  c = Fbnuf
4
5  rtjpv(b bpe c)       # Fbnuf → Bqvi owuv cf Ttwf
6  rtjpv(b qt  c)       # Ttwf  → Av nfbuv qpf Ttwf
7  rtjpv(pqv b)         # Fbnuf → tfxftuf vif tfuwnv qg xbtjbcnf b
8  rtjpv(pqv (b qt c)) # Fbnuf → tfxftuf vif tfuwnv qg (b qt c)
```

TERMINAL

```
Fbnuf
Ttwf
Fbnuf
Fbnuf
```

Example:

MembershipOperatorProgram.py

```
1  # Sjornf Mfocftuijr Orftbvqt Ptqhtbo
2  pbof = ‡P{viqp·
3  rtjpv(‡P· jp pbof)              # Ttwf
4  rtjpv(‡|· pqv jp pbof)          # Ttwf
```

TERMINAL

```
Ttwf
Ttwf
```

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Correct

Example:

LogicalOperatorProgram.py

```
1  # Simple Logical Operator Program
2  a = True
3  b = False
4
5  print(a and b)       # False → Both must be True
6  print(a or  b)       # True  → At least one True
7  print(not a)         # False → reverse the result of variable a
8  print(not (a or b)) # False → reverse the result of (a or b)
```

TERMINAL

```
False
True
False
False
```

Example:

MembershipOperatorProgram.py

```
1  # Simple Membership Operator Program
2  name = "Python"
3  print("P" in name)              # True
4  print("z" not in name)          # True
```

TERMINAL

```
True
True
```


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Page No. 110
Incorrect

Bitwise AND Program.py ×

Bitwise AND Program.py > ...

```
1   # Bjvyjuf AND Orftbvqt Ptqhtbo
2   b = 10     # Bjpbt{: 1010
3   c = 6      # Bjpbt{: 0110
4   rtjpv(‡Bjpbt{ qg b  ·,cjp(b))
5   rtjpv(‡Bjpbt{ qg c  ·,cjp(c))
6
7   tfuwnv = b & c
8
9   rtjpv(‡Rfuwnv = ·,tfuwnv)        # 2
10  rtjpv(‡Bjpbt{ qg Rfuwnv =·,cjp(tfuwnv))  # 0c0010
```

TERMINAL

```
Bjpbt{ qg b   0c1010
Bjpbt{ qg c   0c110
Rfuwnv =  2
Bjpbt{ qg Rfuwnv = 0c10
```

Step by step explain

```
a = 10 →  1 0 1 0
b =  6 →  0 1 1 0
          -------
a & b  →  0 0 1 0  =  2
```

Correct

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Bitwise AND Program.py ×

Bitwise AND Program.py > ...

```
1   # Bitwise AND Operator Program
2   a = 10     # Binary: 1010
3   b = 6      # Binary: 0110
4   print("Binary of a  ",bin(a))
5   print("Binary of b  ",bin(b))
6
7   result = a & b
8
9   print("Result = ",result)        # 2
10  print("Binary of Result =",bin(result))  # 0b0010
```

TERMINAL

```
Binary of a   0b1010
Binary of b   0b110
Result =  2
Binary of Result = 0b10
```

Step by step explain

```
a = 10 →  1 0 1 0
b =  6 →  0 1 1 0
          -------
a & b  →  0 0 1 0  =  2
```


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Incorrect

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Bitwise OR Program.py

```
# Bjvyjuf OR Orftbvqt Ptqhtbo
b = 10     # Bjpbt{: 1010
c = 6      # Bjpbt{: 0110

tfuwnv = b ~ c

rtjpv(tfuwnv)        # 14
rtjpv(cjp(tfuwnv)) # 0c1110
```

TERMINAL

```
14
0b1110
```

Step by step explain

```
a = 10 →  1 0 1 0
b =  6 →  0 1 1 0
          -------
a | b  →  1 1 1 0  =  14
```

Correct

Bitwise OR Program.py

```
# Bitwise OR Operator Program
a = 10     # Binary: 1010
b = 6      # Binary: 0110

result = a | b

print(result)        # 14
print(bin(result))  # 0b1110
```

TERMINAL

```
14
0b1110
```

Step by step explain

```
a = 10 →  1 0 1 0
b =  6 →  0 1 1 0
          -------
a | b  →  1 1 1 0  =  14
```


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Incorrect

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Bitwise XOR Program.py

```
# Bjvyjuf XOR Orftbvqt Ptqhtbo
b = 10     # Bjpbt{: 1010
c = 6      # Bjpbt{: 0110

tfuwnv = b ^ c

rtjpv(tfuwnv)        # 12
rtjpv(cjp(tfuwnv)) # 0c1100
```

TERMINAL

```
12
0b1100
```

Step by step explain

```
a = 10  →  1 0 1 0
b =  6  →  0 1 1 0
           ---------
a ^ b   →  1 1 0 0  =  12
```

Correct

Bitwise XOR Program.py

```
# Bitwise XOR Operator Program
a = 10     # Binary: 1010
b = 6      # Binary: 0110

result = a ^ b

print(result)        # 12
print(bin(result))   # 0b1100
```

TERMINAL

```
12
0b1100
```

Step by step explain

```
a = 10  →  1 0 1 0
b =  6  →  0 1 1 0
           ---------
a ^ b   →  1 1 0 0  =  12
```


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Incorrect

Bitwise NOT Program.py ×

Bitwise NOT Program.py > ...

```
1   # Bjvyjuf NOT Orftbvqt Ptqhtbo
2   b = 10     # Bjpbt{: 0000 1010
3
4   tfuwnv = ib
5
6   rtjpv(tfuwnv)          # -11
7   rtjpv(i5)              # -6
8   rtjpv(i0)              # -1
9   rtjpv(i(-1))           # 0
```

TERMINAL Python

```
-11
-6
-1
0
```

Step by step explain

```
a = 10  → 1 0 1 0
~a      → 0 1 0 1  =  -11
```

Correct

Bitwise NOT Program.py ×

Bitwise NOT Program.py > ...

```
1   # Bitwise NOT Operator Program
2   a = 10     # Binary: 0000 1010
3
4   result = ~a
5
6   print(result)          # -11
7   print(~5)              # -6
8   print(~0)              # -1
9   print(~(-1))           # 0
```

TERMINAL Python

```
-11
-6
-1
0
```

Step by step explain

```
a = 10  → 1 0 1 0
~a      → 0 1 0 1  =  -11
```


CamScanner

Incorrect

Bitwise Shift left Program.py

```
# Bjvyjuf Sijgv LEFT Orftbvqt Ptqhtbo
b = 5     # Bjpbt{: 0000 0101

rtjpv(b << 1)    # 10   → 0000 1010
rtjpv(b << 2)    # 20   → 0001 0100
rtjpv(b << 3)    # 40   → 0010 1000
```

TERMINAL

```
10
20
40
```

Step by step explain

```
a = 5   →  0 0 0 0  0 1 0 1

a << 1  →  0 0 0 0  1 0 1 0  =  10
                      ↑
                (0 beefe qp tjhiv)

a << 2  →  0 0 0 1  0 1 0 0  =  20
                    ↑ ↑
                (vyq 0u beefe qp tjhiv)
```

Bitwise Shift Right Program.py

```
# Bjvyjuf Sijgv RIGHT Orftbvqt Ptqhtbo
b = 20    # Bjpbt{: 0001 0100

rtjpv(b >> 1)    # 10  → 0000 1010
rtjpv(b >> 2)    # 5   → 0000 0101
rtjpv(b >> 3)    # 2   → 0000 0010
```

TERMINAL

```
10
5
2

PS E:\Python Code>
```

Step by step explain

```
a = 20  →  0 0 0 1  0 1 0 0

a >> 1  →  0 0 0 0  1 0 1 0  =  10
              ↑
        (0 beefe qp nfgv)

a >> 2  →  0 0 0 0  0 1 0 1  =  5
              ↑ ↑
        (vyq 0u beefe qp nfgv)
```

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Page No. 114

Correct

Bitwise Shift left Program.py

```
1  # Bitwise Shift LEFT Operator Program
2  a = 5      # Binary: 0000 0101
3
4  print(a << 1)     # 10   → 0000 1010
5  print(a << 2)     # 20   → 0001 0100
6  print(a << 3)     # 40   → 0010 1000
```

TERMINAL

```
10
20
40
```

Step by step explain

```
a = 5   →  0 0 0 0  0 1 0 1

a << 1  →  0 0 0 0  1 0 1 0  =  10
                             ↑
                    (0 added on right)

a << 2  →  0 0 0 1  0 1 0 0  =  20
                           ↑ ↑
                  (two 0s added on right)
```

Bitwise Shift Right Program.py

```
1  # Bitwise Shift RIGHT Operator Program
2  a = 20     # Binary: 0001 0100
3
4  print(a >> 1)     # 10  → 0000 1010
5  print(a >> 2)     # 5   → 0000 0101
6  print(a >> 3)     # 2   → 0000 0010
```

TERMINAL

```
10
5
2

PS E:\Python Code>
```

Step by step explain

```
a = 20  →  0 0 0 1  0 1 0 0

a >> 1  →  0 0 0 0  1 0 1 0  =  10
           ↑
    (0 added on left)

a >> 2  →  0 0 0 0  0 1 0 1  =  5
           ↑ ↑
    (two 0s added on left)
```

Page No. 115

Incorrect

```
rtjpv(‡Epvft vyq pwocftu·)
b = jpv(jprwv(‡Epvft gjtuv pwocft: ·))
c = jpv(jprwv(‡Epvft ufdqpe pwocft: ·))
uwo = b + c
rtjpv(‡uwo =·, uwo)
```

Correct

```
print("Enter two numbers")
a = int(input("Enter first number: "))
b = int(input("Enter second number: "))
sum = a + b
print("sum =", sum)
```


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Incorrect

if statement program.py

```
1  # Tiju ju b jg uvbvfofpv rtqhtbo
2  bhf = jpv(jprwv(‡Epvft {qwt bhf: ·))
3
4  jg bhf >= 18:
5      rtjpv(‡Yqw btf bp Aewnv.·)
6      rtjpv(‡Yqw btf fnjhjcnf vq xqvf.·)
7  rtjpv(‡Ptqhtbo dqpvjpwfu...·)
```

TERMINAL

```
PS E:\P{viqp Cqef> & "python.exe" "e;/Python Code/if statement program.py"
Epvft {qwt bhf: 18
Yqw btf bp Aewnv bpe fnjhjcnf vq xqvf.
Yqw btf fnjhjcnf vq xqvf.
Ptqhtbo Cqpvjpwfu...
```

Condition is true

```
PS E:\P{viqp Cqef> & "python.exe" "e;/Python Code/if statement program.py"
Epvft {qwt bhf: 10
Ptqhtbo Cqpvjpwfu...
PS E:\P{viqp Cqef> ~
```

Condition is false

Correct

if statement program.py

```
1  # This is a if statement program
2  age = int(input("Enter your age: "))
3
4  if age >= 18:
5      print("You are an Adult.")
6      print("You are eligible to vote.")
7  print("Program continues...")
```

TERMINAL

```
PS E:\Python Code> & "python.exe" "e;/Python Code/if statement program.py"
Enter your age: 18
You are an Adult and eligible to vote.
You are eligible to vote.
Program Continues...
```

Condition is true

```
PS E:\Python Code> & "python.exe" "e;/Python Code/if statement program.py"
Enter your age: 10
Program Continues...
PS E:\Python Code> |
```

Condition is false

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Incorrect

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```
jg dqpejvjqp:
    # twpu yifp dqpejvjqp ju Ttwf
fnuf:
    # twpu yifp dqpejvjqp ju Fbnuf
```

if else statement program.py

```
# Tiju ju b jg-fnuf uvbvfofpv rtqhtbo
bhf = jpv(jprwv(‡Epvft {qwt bhf:·))

jg bhf >= 18:
    rtjpv(‡Yqw btf bp Aewnv.·)
    rtjpv(‡Arrn{ gqt CNIC.·)
fnuf:
    rtjpv(‡Yqw btf b Mjpqt.·)
    rtjpv(‡Arrn{ gqt CRC·)

rtjpv(‡Cifdl dqornfvf.·)
```

TERMINAL

```
PS E:\P{viqp Cqef> & "C:/python.exe" "e:/Python Code/if else statement program.py"
Epvft {qwt bhf:18
Yqw btf bp Aewnv.
Arrn{ gqt CNIC.
Cifdl dqornfvf.
PS E:\P{viqp Cqef> & "C:/python.exe" "e:/Python Code/if else statement program.py"
Epvft {qwt bhf:12
Yqw btf b Mjpqt.
Arrn{ gqt CRC
Cifdl dqornfvf.
PS E:\P{viqp Cqef> ~
```

Condition True

Condition False

Correct

```
if condition:
    # runs when condition is True
else:
    # runs when condition is False
```

if else statement program.py

```
# This is a if-else statement program
age = int(input("Enter your age:"))

if age >= 18:
    print("You are an Adult.")
    print("Apply for CNIC.")
else:
    print("You are a Minor.")
    print("Apply for CRC")

print("Check complete.")
```

TERMINAL

```
PS E:\Python Code> & "C:/python.exe" "e:/Python Code/if else statement program.py"
Enter your age:18
You are an Adult.
Apply for CNIC.
Check complete.
PS E:\Python Code> & "C:/python.exe" "e:/Python Code/if else statement program.py"
Enter your age:12
You are a Minor.
Apply for CRC
Check complete.
PS E:\Python Code> |
```

Condition True

Condition False

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Incorrect

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```
jg dqpejvjqp1:
    # twpu jg dqpejvjqp1 ju Ttwf
fnjg dqpejvjqp2:
    # twpu jg dqpejvjqp2 ju Ttwf
fnjg dqpejvjqp3:
    # twpu jg dqpejvjqp3 ju Ttwf
fnuf:
    # twpu jg ALL dqpjejvjqpu btf Fbnuf
```

if elif else statement program.py

```
# Tiju ju b jg-fnjg-fnuf uvbvfofpv rtqhtbo
bhf = jpv(jprwv(‡Epvft {qwt bhf: ‡))

jg bhf <= 0:
    rtjpv(‡Ipxbnje bhf!·)
fnjg bhf <= 12:
    rtjpv(‡Cijne·)
fnjg bhf <= 17:
    rtjpv(‡Tffpbhft·)
fnjg bhf <= 35:
    rtjpv(‡Yqwph Aewnv·)
fnjg bhf <= 60:
    rtjpv(‡Mjeenf-Ahfe Aewnv·)
fnuf:
    rtjpv(‡Sfpjqt Cjvj|fp·)
```

TERMINAL

```
PS E:\P{viqp Cqef> & "C:/Hassan Zaidi/Python/Python314/python.exe" "e:/Python Code/if elif else statement program.py"
Epvft {qwt bhf: 17
Tffpbhft
PS E:\P{viqp Cqef>
```

Correct

```
if condition1:
    # runs if condition1 is True
elif condition2:
    # runs if condition2 is True
elif condition3:
    # runs if condition3 is True
else:
    # runs if ALL coniditions are False
```

if elif else statement program.py

```
# This is a if-elif-else statement program
age = int(input("Enter your age: "))

if age <= 0:
    print("Invalid age!")
elif age <= 12:
    print("Child")
elif age <= 17:
    print("Teenager")
elif age <= 35:
    print("Young Adult")
elif age <= 60:
    print("Middle-Aged Adult")
else:
    print("Senior Citizen")
```

TERMINAL

```
PS E:\Python Code> & "C:/Hassan Zaidi/Python/Python314/python.exe" "e:/Python Code/if elif else statement program.py"
Enter your age: 17
Teenager
PS E:\Python Code>
```


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Incorrect

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```
jg dqpejvjqp1:
    # qwvft jg cnqd1
    jg dqpejvjqp2:
        # jppft jg cnqd1
        jg dqpejvjqp3:
            # effrn{ pfuvfe cnqd1
        fnuf:
            # jppft fnuf
    fnuf:
        # jppft fnuf
fnuf:
    # qwvft fnuf
```

Nested if statement program.py

```
# Tiju ju b pfuvfe jg uvbvfofpv rtqhtbo
bhf     =jpv(jprwv(‡Epvft {qwt bhf:·))
ubnbt{ = jpv(jprwv(‡Epvft {qwt oqpvin{ Sbnbt{:·))

jg bhf >= 18:
    rtjpv(‡Ahf tfswjtfofpv ofv·)
    jg ubnbt{ >= 30000:
        rtjpv(‡Sbnbt{ tfswjtfofpv ofv·)
        rtjpv(‡Lqbp APPROVED!·)
    fnuf:
        rtjpv(‡Sbnbt{ vqq nqy·)
        rtjpv(‡Lqbp REJECTED!·)
fnuf:
    rtjpv(‡Ahf tfswjtfofpv pqv ofv·)
    rtjpv(‡Lqbp REJECTED!·)
```

TERMINAL

```
PS E:\P{viqp Cqef> & "C:/Hassan Zaidi/AppData/Local/Programs/Python/Python314/python.exe" "e:/Python Code/Nested if statement program.py"
Epvft {qwt bhf:24
Epvft {qwt oqpvin{ Sbnbt{:35000
Ahf tfswjtfofpv ofv
Sbnbt{ tfswjtfofpv ofv
Lqbp APPROVED!
PS E:\P{viqp Cqef> & "C:/Hassan Zaidi/AppData/Local/Programs/Python/Python314/python.exe" "e:/Python Code/Nested if statement program.py"
Epvft {qwt bhf:24
Epvft {qwt oqpvin{ Sbnbt{:18000
Ahf tfswjtfofpv ofv
Sbnbt{ vqq nqy
Lqbp REJECTED!
```

Correct

```
if condition1:
    # outer if block
    if condition2:
        # inner if block
        if condition3:
            # deeply nested block
        else:
            # inner else
    else:
        # inner else
else:
    # outer else
```

Nested if statement program.py

```
# This is a nested if statement program
age     =int(input("Enter your age:"))
salary = int(input("Enter your monthly Salary:"))

if age >= 18:
    print("Age requirement met")
    if salary >= 30000:
        print("Salary requirement met")
        print("Loan APPROVED!")
    else:
        print("Salary too low")
        print("Loan REJECTED!")
else:
    print("Age requirement not met")
    print("Loan REJECTED!")
```

TERMINAL

```
PS E:\Python Code> & "C:/Hassan Zaidi/AppData/Local/Programs/Python/Python314/python.exe" "e:/Python Code/Nested if statement program.py"
Enter your age:24
Enter your monthly Salary:35000
Age requirement met
Salary requirement met
Loan APPROVED!
PS E:\Python Code> & "C:/Hassan Zaidi/AppData/Local/Programs/Python/Python314/python.exe" "e:/Python Code/Nested if statement program.py"
Enter your age:24
Enter your monthly Salary:18000
Age requirement met
Salary too low
Loan REJECTED!
```


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Page No. 120

Incorrect

```
gqt xbtjbcnf jp ufswfpdf:
    # cqe{ qg nqqr
```

Correct

```
for variable in sequence:
    # body of loop
```

Page No. 121

Incorrect

FOR Loop program.py

```
1  # Tiju ju b Fqt Lqqr uvbvfofpv rtqhtbo
2
3  gqt j jp tbphf(5):
4      rtjpv (j)
```

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```
PS E:\P{viqp Cqef> & "C:/Python/Python314/python.exe" "e:/Python Code/FOR Loop program.py"
0
1
2
3
4
```

```
tbphf(uvqr)
tbphf(uvbtv, uvqr)
tbphf(uvbtv, uvqr, uvfr)
```

start: The beginning value of the sequence. Default value is 0
stop: The ending value
step: The increment between each number. Default is 1.

i) **range (stop):**
Generates numbers from 0 up to (but not including) stop.

```
gqt j jp tbphf(5):
    rtjpv(j)

# Output: 0 1 2 3 4
```

ii) **range (start , stop):**
Generates numbers from start up to (but not including) stop.

```
gqt j jp tbphf(2, 8):
    rtjpv(j)

# Output: 2 3 4 5 6 7
```

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FOR Loop program.py

```
1  # This is a For Loop statement program
2
3  for i in range(5):
4      print (i)
```

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```
PS E:\Python Code> & "C:/Python/Python314/python.exe" "e:/Python Code/FOR Loop program.py"
0
1
2
3
4
```

```
range(stop)
range(start, stop)
range(start, stop, step)
```

start: The beginning value of the sequence. Default value is 0
stop: The ending value
step: The increment between each number. Default is 1.

i) **range (stop):**
Generates numbers from 0 up to (but not including) stop.

```
for i in range(5):
    print(i)

# Output: 0 1 2 3 4
```

ii) **range (start , stop):**
Generates numbers from start up to (but not including) stop.

```
for i in range(2, 8):
    print(i)

# Output: 2 3 4 5 6 7
```

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iii) range (start , stop , step):

Generates numbers from start to stop, incrementing by step.

(1) Positive step (count up)

```
gqt j jp tbphf(0, 10, 2):
    rtjpv(j)

# Output: 0 2 4 6 8
```

(2) Negative step (count down):

```
gqt j jp tbphf(10, 0, -2):
    rtjpv(j)

# Output: 10 8 6 4 2
```

Example: Even & Odd number program

FOR Loop program2.py

```
1  # Tiju ju b Fqt Lqqr uvbvfofpv rtqhtbo
2
3  gqt j jp tbphf(0,10,2):
4      rtjpv (‡Exfp ·,j)
5
6  gqt j jp tbphf(1,10,2):
7      rtjpv (‡Oee ·,j)
```

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```
Exfp 0
Exfp 2
Exfp 4
Exfp 6
Exfp 8
Oee  1
Oee  3
Oee  5
Oee  7
Oee  9
```

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iii) range (start , stop , step):

Generates numbers from start to stop, incrementing by step.

(1) Positive step (count up)

```
for i in range(0, 10, 2):
    print(i)

# Output: 0 2 4 6 8
```

(2) Negative step (count down):

```
for i in range(10, 0, -2):
    print(i)

# Output: 10 8 6 4 2
```

Example: Even & Odd number program

FOR Loop program2.py

```
1  # This is a For Loop statement program
2
3  for i in range(0,10,2):
4      print ("Even ",i)
5
6  for i in range(1,10,2):
7      print ("Odd ",i)
```

TERMINAL

```
Even 0
Even 2
Even 4
Even 6
Even 8
Odd  1
Odd  3
Odd  5
Odd  7
Odd  9
```

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Incorrect

```
yijnf dqpejvjqp:
    # cqe{ qg nqqr
```

Example:

```
dqwpv = 1
yijnf dqwpv <= 5:
    rtjpv(dqwpv)
    dqwpv += 1
# Output: 1 2 3 4 5
```

```
gqt j jp tbphf(6):
    jg j == 3:
        ctfbl
    rtjpv(j)
# Output: 0 1 2
```

```
gqt j jp tbphf(6):
    jg j % 2 == 0:
        Cqpvjpwf
    rtjpv(j)
# Output: 1 3 5
```

Correct

```
while condition:
    # body of loop
```

Example:

```
count = 1
while count <= 5:
    print(count)
    count += 1
# Output: 1 2 3 4 5
```

```
for i in range(6):
    if i == 3:
        break
    print(i)
# Output: 0 1 2
```

```
for i in range(6):
    if i % 2 == 0:
        Continue
    print(i)
# Output: 1 3 5
```


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Page No. 124
Incorrect

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```
gqt qwvft jp tbphf(...):
    gqt jppft jp tbphf(...):
        # code block
```

Nested Loop program.py

```
1  # Tiju ju b Nfuvfe Lqqr uvbvfofpv rtqhtbo
2
3  gqt j jp tbphf(1, 4):
4      gqt k jp tbphf(1, 4):
5          rtjpv(‡j =·, j, ‡k =·, k)
6      rtjpv(‡·)
```

Correct

```
for outer in range(...):
    for inner in range(...):
        # code block
```

Nested Loop program.py

```
1  # This is a Nested Loop statement program
2
3  for i in range(1, 4):
4      for j in range(1, 4):
5          print("i =", i, "j =", j)
6      print("")
```

Page No. 125
Incorrect

```
gqt j jp tbphf(3):                          # Repetition
    pwocft = jpv(jprwv(‡Epvft b pwocft: ·)) # Sequence
    jg pwocft % 2 == 0:                     # Selection
        rtjpv(‡Exfp·)
    fnuf:
        rtjpv(‡Oee·)
```

Correct

```
for i in range(3):                          # Repetition
    number = int(input("Enter a number: "))  # Sequence
    if number % 2 == 0:                     # Selection
        print("Even")
    else:
        print("Odd")
```


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2. Program Shopping Bill Calculator:

Combine program.py ×

Combine program.py > ...

```
#   Siqrrjph Bjnn Cbndwnbvqt

rtjpv(‡===== SHOPPING BILL CALCULATOR =====·)
vqvbn    = 0.0    # gnqbv - vqvbn cjnn boqwpv
dqwpv    = 0      # jpv   - pwocft qg jvfou
uiqrrjph = Ttwf   # cqqn  - dqpvtqnu vif nqqr

# REPETITION: Kffr beejph jvfou
yijnf uiqrrjph:
    jvfo  = jprwv(‡\pEpvft Ivfo Nbof (qt "eqpf„ vq gjpjui): ·)
    # SELECTION: Cifdl jg wuft ybpvu vq uvqr
    jg jvfo.nqyft() == ‡eqpf·:
        uiqrrjph = Fbnuf
    fnuf:
        rtjdf = gnqbv(jprwv(g‡Epvft Ptjdf qg }jvfo : Ru. ·))
        # SELECTION: Vbnjebvf rtjdf
        jg rtjdf <= 0:
            rtjpv(‡Ipxbnje rtjdf! Tt{ bhbjp.·)
        fnuf:
            vqvbn = vqvbn + rtjdf
            dqwpv = dqwpv + 1
            rtjpv(g‡}jvfo  beefe - Ru. }rtjdf:.2g ·)

# — Swoobt{ —
rtjpv(‡\p======== BILL SUMMARY ========·)
jg dqwpv == 0:
    rtjpv(‡Nq Ivfou rwtdibufe.·)
fnuf:
    rtjpv(g‡Tqvbn Ivfou  : }dqwpv ·)
    rtjpv(g‡Tqvbn Bjnn   : Ru. }vqvbn:.2g ·)

    # SELECTION: Arrn{ ejudqwpv cbufe qp vqvbn
    jg vqvbn >= 5000:
        ejudqwpv = vqvbn * 0.20
        nbcfn    = ‡20% Djudqwpv·
    fnjg vqvbn >= 2000:
        ejudqwpv = vqvbn * 0.10
        nbcfn    = ‡10% Djudqwpv·
    fnuf:
        ejudqwpv = 0
        nbcfn    = ‡Nq Djudqwpv·

    gjpbn = vqvbn - ejudqwpv
    rtjpv(g‡Djudqwpv     : }nbcfn   (-Ru. }ejudqwpv:.2g )·)
    rtjpv(g‡Fjpbn Bjnn   : Ru. }gjpbn:.2g ·)
rtjpv(‡================================·)
```


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2. Program Shopping Bill Calculator:

Combine program.py

```
#   Shopping Bill Calculator

print("===== SHOPPING BILL CALCULATOR =====")
total    = 0.0    # float - total bill amount
count    = 0      # int   - number of items
shopping = True   # bool  - controls the loop

# REPETITION: Keep adding items
while shopping:
    item = input("\nEnter Item Name (or 'done' to finish): ")
    # SELECTION: Check if user wants to stop
    if item.lower() == "done":
        shopping = False
    else:
        price = float(input(f"Enter Price of {item}: Rs. "))
        # SELECTION: Validate price
        if price <= 0:
            print("Invalid price! Try again.")
        else:
            total = total + price
            count = count + 1
            print(f"{item} added - Rs. {price:.2f}")

# — Summary —
print("\n======== BILL SUMMARY ========")
if count == 0:
    print("No Items purchased.")
else:
    print(f"Total Items  : {count}")
    print(f"Total Bill   : Rs. {total:.2f}")

    # SELECTION: Apply discount based on total
    if total >= 5000:
        discount = total * 0.20
        label    = "20% Discount"
    elif total >= 2000:
        discount = total * 0.10
        label    = "10% Discount"
    else:
        discount = 0
        label    = "No Discount"

    final = total - discount
    print(f"Discount     : {label}  (-Rs. {discount:.2f})")
    print(f"Final Bill   : Rs. {final:.2f}")
print("================================")
```


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Page No. 127

Incorrect

1. **import module:**
   Import the **entire module**. Access functions using module.function()

```
jorqtv obvi

tfuwnv = obvi.ustv(25)
rtjpv(tfuwnv)          # Output: 5.0

tfuwnv = obvi.rj
rtjpv(tfuwnv)          # Output: 3.141592653589793
```

2. **import module as alias:**
   Import module with a short nickname (alias).

```
jorqtv obvi bu o

rtjpv(o.ustv(16))      # Output: 4.0
rtjpv(o.rj)            # Output: 3.141592653589793
```

Correct

1. **import module:**
   Import the **entire module**. Access functions using module.function()

```
import math

result = math.sqrt(25)
print(result)          # Output: 5.0

result = math.pi
print(result)          # Output: 3.141592653589793
```

2. **import module as alias:**
   Import module with a short nickname (alias).

```
import math as m

print(m.sqrt(16))      # Output: 4.0
print(m.pi)            # Output: 3.141592653589793
```

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Incorrect

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```
gtqo obvi jorqtv ustv

rtjpv(ustv(36))      # Output: 6.0
# No need to write math.sqrt()
```

4. **from module import function 1, function 2:**
Import multiple specific functions at once.

```
gtqo obvi jorqtv ustv, rj, gbdvqtjbn

rtjpv(ustv(49))      # Output: 7.0
rtjpv(rj)            # Output: 3.141592653589793
```

5. **from module import *:**
Import everything from a module.

```
gtqo obvi jorqtv *

rtjpv(ustv(64))      # Output: 8.0
rtjpv(rj)            # Output: 3.141592653589793
rtjpv(dfjn(4.3))     # Output: 5
```

Correct

```
from math import sqrt

print(sqrt(36))      # Output: 6.0
# No need to write math.sqrt()
```

4. **from module import function 1, function 2:**
Import multiple specific functions at once.

```
from math import sqrt, pi, factorial

print(sqrt(49))      # Output: 7.0
print(pi)            # Output: 3.141592653589793
```

5. **from module import *:**
Import everything from a module.

```
from math import *

print(sqrt(64))      # Output: 8.0
print(pi)            # Output: 3.141592653589793
print(ceil(4.3))     # Output: 5
```


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Math Library program.py

```
1   jorqtv obvi
2
3   rtjpv(obvi.rj)              # Pj xbnwf      → 3.14159...
4   rtjpv(obvi.dfjn(4.3))       # Rqwpe wr      → 5
5   rtjpv(obvi.gnqqt(4.9))      # Rqwpe eqyp    → 4
6   rtjpv(obvi.rqy(2, 4))       # Pqyft 2^4     → 16.0
7   rtjpv(obvi.ustv(81))        # Sswbtf tqqv   → 9.0
```

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```
PS E:\P{viqp Cqef>& "C:/Python/Python314/python.exe" "e:/Python Code/Math Library program.py"
3.141592653589793
5
4
16.0
9.0
PS E:\P{viqp Cqef>~
```

- random: library is used for generating random numbers or making random selections.

random program.py

```
2   jorqtv tbpeqo
3
4   # Gfpftbvjph b tbpeqo pwocft cfvyffp 1 vq 10
5   tbpeqo_pwo = tbpeqo.tbpejpv(1,10)
6   rtjpv(‡Rbpeqo Nwocft: ·,tbpeqo_pwo)
7   rtjpv(tbpeqo.tbpeqo())          # Rbpeqo gnqbv
8   rtjpv(tbpeqo.wpjgqto(1.5, 9.5))  # Rbpeqo gnqbv jp tbphf
9
```

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```
PS E:\P{viqp Cqef>& "C:/Python/Python314/python.exe" "e:/Python Code/random program.py"
Rbpeqo Nwocft:  8
0.5689448558030233
4.15758310615087

PS E:\P{viqp Cqef>~
```

Correct

Math Library program.py

```
1   import math
2
3   print(math.pi)              # Pi value      → 3.14159...
4   print(math.ceil(4.3))       # Round up      → 5
5   print(math.floor(4.9))      # Round down    → 4
6   print(math.pow(2, 4))       # Power 2^4     → 16.0
7   print(math.sqrt(81))        # Square root   → 9.0
```

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```
PS E:\Python Code>& "C:/Python/Python314/python.exe" "e:/Python Code/Math Library program.py"
3.141592653589793
5
4
16.0
9.0
PS E:\Python Code>|
```

- random: library is used for generating random numbers or making random selections.

random program.py

```
2   import random
3
4   # Generating a random number between 1 to 10
5   random_num = random.randint(1,10)
6   print("Random Number: ",random_num)
7   print(random.random())          # Random float
8   print(random.uniform(1.5, 9.5))   # Random float in range
9
```

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```
PS E:\Python Code>& "C:/Python/Python314/python.exe" "e:/Python Code/random program.py"
Random Number:  8
0.5689448558030233
4.15758310615087

PS E:\Python Code>|
```


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- datetime: library provides classes for working with dates and time.

datetime prog.py

C: > Users > Hassan Zaidi > Python Program > datetime prog.py > ...

```
jorqtv ebvfvjof

# Gfvvjph dwttfpv ebvf bpe vjof
dwttfpv_ebvfvjof = ebvfvjof.ebvfvjof.pqy()
rtjpv(‡Cwttfpv Dbvf bpe Tjof: ·, dwttfpv_ebvfvjof)


                                                    # Fqtobvvjph b ebvf
gqtobvvfe_ebvf = dwttfpv_ebvfvjof.uvtgvjof(‡%e-%o-%Y·)  #  %Y ofbpu {fbt rbtv,
rtjpv (‡Fqtobvvfe Dbvf: ·,gqtobvvfe_ebvf)               #  %o ofbpu oqpvi rbtv
                                                    #  %e ofbpu ebvf rbtv
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Uuftu\Hbuubp Zbjej> r{viqp.fzf ‡d:/Uuftu/Hbuubp Zbjej/P{viqp Ptqhtbo
/ebvfvjof rtqh.r{·
Cwttfpv Dbvf bpe Tjof:  2026-01-19 21:47:00.099923
Fqtobvvfe Dbvf:  19-01-2026
PS C:\Uuftu\Hbuubp Zbjej>
```

Activity: Program that generate student report card by using library functions

student report program.py

student report program.py > ...

```
#   Svwefpv Rfrqtv Cbte Gfpftbvqt
#   Ljctbtjfu: obvi, tbpeqo, ebvfvjof

jorqtv obvi        # Fqt obvifobvjdbn dbndwnbvjqpu
jorqtv tbpeqo      # Fqt hfpftbvjph tqnn pwocft
jorqtv ebvfvjof    # Fqt tfrqtv ebvf bpe vjof

rtjpv(‡       STUDENT REPORT CARD GENERATOR·)
# — ebvfvjof njctbt{ —
# Gfv dwttfpv ebvf bpe vjof gqt vif tfrqtv dbte
pqy     = ebvfvjof.ebvfvjof.pqy()
ebvf    = pqy.uvtgvjof(‡%e-%o-%Y·)   # Fqtobv: Db{-Mqpvi-Yfbt
vjof    = pqy.uvtgvjof(‡%I:%M %r·)   # Fqtobv: Hqwt:Mjp AM/PM
rtjpv(g‡Dbvf : }ebvf  Tjof : }vjof ·)

# — tbpeqo njctbt{ —
# Gfpftbvf b tbpeqo Rqnn Nwocft
tqnn_pq = tbpeqo.tbpejpv(100, 999)

```


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- datetime: library provides classes for working with dates and time.

datetime prog.py

C: > Users > Hassan Zaidi > Python Program > datetime prog.py > ...

```
1   import datetime
2
3   # Getting current date and time
4   current_datetime = datetime.datetime.now()
5   print("Current Date and Time: ", current_datetime)
6
7                                                    # Formatting a date
8   formatted_date = current_datetime.strftime("%d-%m-%Y")    #  %Y means year part,
9   print ("Formatted Date: ",formatted_date)                 #  %m means month part
10                                                           #  %d means date part
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\Hassan Zaidi> python.exe "c:/Users/Hassan Zaidi/Python Program
/datetime prog.py"
Current Date and Time:  2026-01-19 21:47:00.099923
Formatted Date:  19-01-2026
PS C:\Users\Hassan Zaidi>
```

Activity: Program that generate student report card by using library functions

student report program.py

student report program.py > ...

```
1   #   Student Report Card Generator
2   #   Libraries: math, random, datetime
3
4   import math         # For mathematical calculations
5   import random       # For generating roll number
6   import datetime     # For report date and time
7
8   print("       STUDENT REPORT CARD GENERATOR")
9   # — datetime library —
10  # Get current date and time for the report card
11  now     = datetime.datetime.now()
12  date    = now.strftime("%d-%m-%Y")     # Format: Day-Month-Year
13  time    = now.strftime("%I:%M %p")     # Format: Hour:Min AM/PM
14  print(f"Date : {date} Time : {time}")
15
16  # — random library —
17  # Generate a random Roll Number
18  roll_no = random.randint(100, 999)
19
```


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Page No. 131
Incorrect

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```
# — Iprwv uvwefpv jpgqtobvjqp —
pbof = jprwv(‡\pEpvft Svwefpv Nbof    : ·) # \p ju wufe gqt pfy njpf
rtjpv(‡\pEpvft Mbtlu gqt Ebdi Swckfdv (Owv qg 100):·)
obtlu1 = gnqbv(jprwv(‡   Mbvifobvjdu : ·))
obtlu2 = gnqbv(jprwv(‡   Sdjfpdf     : ·))
obtlu3= gnqbv(jprwv(‡   Cqorwvft    : ·))

# Cbndwnbvf vqvbn bpe rftdfpvbhf
vqvbn      = obtlu1 + obtlu2 + obtlu3
rftdfpvbhf = (vqvbn / 300) * 100

# — Sfnfdvjqp: Pbuu qt Fbjn —
jg rftdfpvbhf >= 50:
    uvbvwu = ‡PASS ·
fnuf:
    uvbvwu = ‡FAIL ·

#   Djurnb{ Rfrqtv Cbte
rtjpv(‡\p            OFFICIAL REPORT CARD·)
rtjpv(g‡  Rqnn Nq       : }tqnn_pq ·)
rtjpv(g‡  Nbof          : }pbof ·)
rtjpv(g‡  Dbvf          : }ebvf ·)     Tjof: }vjof ·)
rtjpv(g‡  Mbvifobvjdu\v Owv qg 100 \v }obtlu1  ·)   # \v ju wufe gqt vbc
rtjpv(g‡  Sdjfpdf\v Owv qg 100 \v }obtlu2 ·)
rtjpv(g‡  Cqorwvft\v Owv qg 100 \v }obtlu3:<10 ·)
rtjpv(g‡  Tqvbn Mbtlu\v Owv qg 300 \v }vqvbn:<10 ·)
rtjpv(g‡  Pftdfpvbhf\v }rftdfpvbhf:.2g %·)
rtjpv(g‡  Svbvwu\v }uvbvwu ·)
rtjpv(‡       *** Epe qg Rfrqtv Cbte ***·)
```

```
TERMINAL                                                    Python

● PS E:\P{viqp Cqef>& "C:/Programs/Python/Python314/python.exe" "e:/Python Code/student report program.py"
        STUDENT REPORT CARD GENERATOR
  Dbvf : 13-04-2026 Tjof : 01:41 AM

  Epvft Svwefpv Nbof   : Hbuubp Rb|b

  Epvft Mbtlu gqt Ebdi Swckfdv (Owv qg 100):
     Mbvifobvjdu : 77
     Sdjfpdf     : 84
     Cqorwvft    : 92

              OFFICIAL REPORT CARD
    Rqnn Nq       : 105
    Nbof          : Hbuubp Rb|b
    Dbvf          : 13-04-2026       Tjof: 01:41 AM
    Mbvifobvjdu     Owv qg 100       77.0
    Sdjfpdf         Owv qg 100       84.0
    Cqorwvft        Owv qg 100       92.0
    Tqvbn Mbtlu     Owv qg 300       253.0
    Pftdfpvbhf      84.33%
    Svbvwu          PASS
        *** Epe qg Rfrqtv Cbte ***
○ PS E:\P{viqp Cqef>~
```

Page No. 132
Incorrect

```
rjr jpuvbnn njctbt{_pbof

rtjpv(‡Hfnnq Wqtne·  # Missing closing parenthesis

z = 10 / 0   # Division by zero

j = 1
yijnf j < 6:
  rtjpv(j)
  j -= 1  #nqhjdbn fttqt: - ojpwu uiqwne cf tfrnbdf yjvi + rnwu ujhp
```


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Page No. 131
Correct

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```
# — Input student information —
name = input("\nEnter Student Name    : ") # \n is used for new line
print("\nEnter Marks for Each Subject (Out of 100):")
marks1 = float(input("   Mathematics : "))
marks2 = float(input("   Science     : "))
marks3= float(input("   Computer    : "))

# Calculate total and percentage
total      = marks1 + marks2 + marks3
percentage = (total / 300) * 100

# — Selection: Pass or Fail —
if percentage >= 50:
    status = "PASS "
else:
    status = "FAIL "

#   Display Report Card
print("\n            OFFICIAL REPORT CARD")
print(f"  Roll No       : {roll_no}")
print(f"  Name          : {name}")
print(f"  Date          : {date}")     Time: {time}")
print(f"  Mathematics\t Out of 100 \t {marks1} ")   # \t is used for tab
print(f"  Science\t Out of 100 \t {marks2}")
print(f"  Computer\t Out of 100 \t {marks3:<10}")
print(f"  Total Marks\t Out of 300 \t {total:<10}")
print(f"  Percentage\t {percentage:.2f}%")
print(f"  Status\t {status}")
print("       *** End of Report Card ***")
```

```
TERMINAL                                                    Python

● PS E:\Python Code>& "C:/Programs/Python/Python314/python.exe" "e:/Python Code/student report program.py"
        STUDENT REPORT CARD GENERATOR
  Date : 13-04-2026 Time : 01:41 AM

  Enter Student Name    : Hassan Raza

  Enter Marks for Each Subject (Out of 100):
     Mathematics : 77
     Science     : 84
     Computer    : 92

            OFFICIAL REPORT CARD
    Roll No       : 105
    Name          : Hassan Raza
    Date          : 13-04-2026       Time: 01:41 AM
    Mathematics     Out of 100       77.0
    Science         Out of 100       84.0
    Computer        Out of 100       92.0
    Total Marks     Out of 300       253.0
    Percentage      84.33%
    Status          PASS
         *** End of Report Card ***
○ PS E:\Python Code>
```

Page No. 132
Correct

```
pip install library_name
```

```
print("Hello World"   # Missing closing parenthesis
x = 10 / 0   # Division by zero
i = 1
while i < 6:
  print(i)
  i -= 1  #logical error: - minus should be replace with + plus sign
```


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Example 1:

```
debug program.py ×
debug program.py > ...
1   z= jpv(‡bcd·)

TERMINAL                                                    Python
PS E:\P{viqp Cqef> & "C:/Users/Hassan Zaidi/AppData/Local/Programs/Python/Python314/python.exe
" "e:/Python Code/debug program.py"
Ttbdfcbdl (oquv tfdfpv dbnn nbuv):
  Fjnf ‡f:\P{viqp Cqef\efcwh rtqhtbo.r{·, njpf 1, jp <oqewnf>
    z= jpv(‡bcd·)
VbnwfEttqt: jpxbnje njvftbn gqt jpv() yjvi cbuf 10: "bcd„
PS E:\P{viqp Cqef>~
```

Example 2:

```
debug program.py 1 ×
debug program.py > ...
1   b = 33
2   c = 200
3
4   jg c > b:
5   rtjpv(‡c ju htfbvft vibp b·)

TERMINAL                                                    Python
PS E:\P{viqp Cqef> & "C:/Users/Hassan Zaidi/AppData/Local/Programs/Python/Python314/python.exe
" "e:/Python Code/debug program.py"
  Fjnf ‡f:\P{viqp Cqef\efcwh rtqhtbo.r{·, njpf 5
    rtjpv(‡c ju htfbvft vibp b·)
    ^^^^^
IpefpvbvjqpEttqt: fzrfdvfe bp jpefpvfe cnqdl bgvft "jg„ uvbvfofpv qp njpf 4
PS E:\P{viqp Cqef>~
```

Correct

Example 1:

```
debug program.py ×
debug program.py > ...
1   x= int("abc")

TERMINAL                                                    Python
PS E:\Python Code> & "C:/Users/Hassan Zaidi/AppData/Local/Programs/Python/Python314/python.exe
" "e:/Python Code/debug program.py"
Traceback (most recent call last):
  File "e:\Python Code\debug program.py", line 1, in <module>
    x= int("abc")
ValueError: invalid literal for int() with base 10: 'abc'
PS E:\Python Code>|
```

Example 2:

```
debug program.py 1 ×
debug program.py > ...
1   a = 33
2   b = 200
3
4   if b > a:
5   print("b is greater than a")

TERMINAL                                                    Python
PS E:\Python Code> & "C:/Users/Hassan Zaidi/AppData/Local/Programs/Python/Python314/python.exe
" "e:/Python Code/debug program.py"
  File "e:\Python Code\debug program.py", line 5
    print("b is greater than a")
    ^^^^^
IndentationError: expected an indented block after 'if' statement on line 4
PS E:\Python Code>|
```


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