Only questions... for the first to sixth slides (1-6).” programming fundamentals"

LEC 2

Example (1): Design an algorithm and the corresponding flowchart for input two number and output their addition (summation).

Example (2): Design an algorithm and the corresponding flowchart for input three number and output their average.

Example (3): Design an algorithm for input two number and computes the arithmetic operators.

Example (4): Write an algorithm and the corresponding flowchart to read length in feet and convert to centimeter.

Example (5): Write an algorithm and the corresponding flowchart to read temperature in Fahrenheit and convert to Celsius.

Example (6): Write an algorithm and the corresponding flowchart to read length of slide and compute area and circumference (perimeter) of square.

Example (7): Write an algorithm and the corresponding flowchart to read number and check if it's even or

Example (8): Write an algorithm and the corresponding flowchart to read number and check if it's positive or negative

Example (9): write an algorithm to find the greater number between two numbers

Example (10): Write an algorithm enter the marks for student and print the student grade.

Mark	Grade
>=85	Excellent
>=75<85	Very good
>=65<75	Good
>=50<65	Pass
<50	Fail

WORK SHEET (1)

Q1- Write an algorithm and draw a flowchart to read length in millimeter and convert to centimeter.

Q2- Write an algorithm and draw a flowchart to read length of width and height and compute area and circumference (perimeter) of rectangle.

Q3- Write an algorithm to read length of radios and compute area and circumference (perimeter) of circle.

Q4- Write an algorithm and draw a flowchart that will calculate the roots of a quadratic equation: $ax2 + bx + c = 0$ Hint: $d = \sqrt{b}\ 2 - 4ac$, and the roots are: x1 = (–b + d)/2a and x2 = (–b – d)/2a

Q5- write an algorithm to find the result of equation

$$f(x) = \begin{cases} -x, & x < 0 \\ x, & x \geq 0 \end{cases}$$

Q6- Write algorithm and draw a flowchart to read a city of Iraq as number and print the estimation to refer it. Hint: 1 Baghdad, 2 Basra, 3 Mosul, 4 Erbil

LEC 3

Example (1): Write an algorithm and the corresponding flowchart for print numbers between 1 to 5.

Example (2): Write an algorithm and the corresponding flowchart for print even numbers between 0 to 10.

Example (3): Design an algorithm and the corresponding flowchart which asks the user for a number N and prints the sum of the numbers 1 to N?

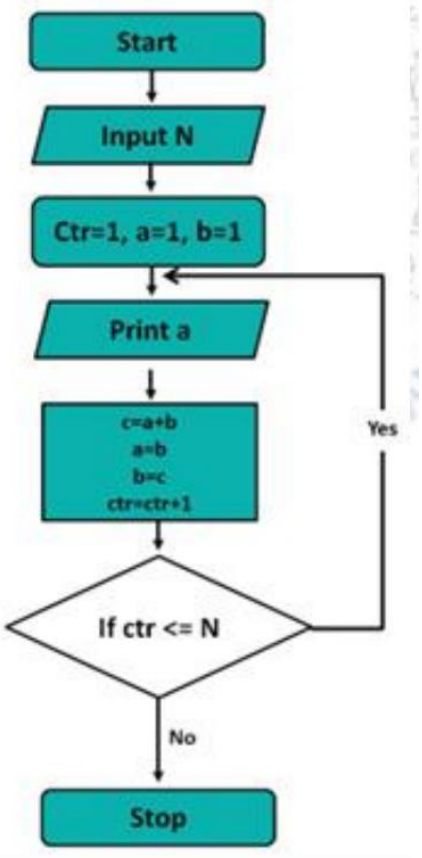
Example (4): Write algorithm and the corresponding flowchart to read n numbers and print the largest number of them.

Example (5): Write an algorithm and the corresponding flowchart to find $X\ Y$ i.e. power (X, Y).

Example (6): Write an algorithm with number n as input which calculates following formula:

$$S = ½ + ¼ + \ldots + 1/n$$

Example (7): Draw a Flowchart to generate Fibonacci series as 1,1,2,3,5, 8… where number N as input of terms:



WORK SHEET (2)

Q1- Write an algorithm for print odd numbers between 5 to 20.

Q2- Draw Flowchart for the calculate average from 5 exam scores.

Q3- Write an algorithm and corresponding flowchart to read number and check if it's prime or not prime

Q4- Write an algorithm to find factorial X! Hint: x! = x * x-1 * x-2 * x-3 * ... * 2 * 1

Q5- Write an algorithm and the corresponding flowchart for finding the sum of the numbers 4, 16, 64, 256, 1024, …, n

Q6- Write an algorithm and the corresponding flowchart for reading N numbers and get the summation of negative, the summation of positive numbers and the number in each group

Example: print(function)

```
print(1,2,3,4)
print(1,2,3,4,sep='*')
print(1,2,3,4,sep='#',end='&')
```

Example: Python type() function for Numeric Data type

```
num1 = 5
 print(num1, 'is of type', type(num1))

num2 = 2.0
print(num2, 'is of type', type(num2))

num3 = 1+2j
print(num3, 'is of type', type(num3))
```

Example: Python Casting for int

```
x = int(1) # x will be 1
y = int(2.8) # y will be 2
z = int("3") # z will be 3
```

Example: Python Casting for float

```
x = float(1) # x will be 1.0
y = float(2.8) # y will be 2.8
z = float("3") # z will be 3.0
w = float("4.2") # w will be 4.2
```

Example: Python Casting for str

```
x = str("s1") # x will be 's1 '
y = str(2) # y will be '2 '
z = str(3.0) # z will be '3.0'
```

Example: Python Implicit Type Conversion

```
a = 123
b = 1.23
c = a + b
print(c)
print(type(c))
a = 123
b = "5"
c = a + b
print(c)
print(type(c))
```

Example: Python Implicit Type Conversion

```
a = 123
b = int("5")
c = a + b
print(c)
print(type(c))
```

Example: Arithmetic operators Example: Arithmetic operators

```
x = 10
y = 4
print ('x + y =', x+y)
print ('x - y =', x-y)
print ('x * y =', x*y)
print ('x / y =', x/y)
print ('x // y =', x//y)
print ('x ** y =', x**y)
```

Example: Arithmetic operators

```
x = 10
y = 12
print('x > y is',x>y)
print('x < y is',x<y)
print('x <= y is',x<=y)
print('x >= y is',x>=y)
print('x == y is',x==y)
print('x != y is',x != y)
```

Examples of Python Program

Example (1): Write Python Program for input two number and output their addition (summation).

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Example (4): Write Python Program to read length in feet and convert to centimeter

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LEC 6

Example: Logical operators

```
a,b = 5,6
print((a > 2) and (b >= 6))
print(True and False)
print(True or False)
print(not True)
print (not(x < 5 and x < 10))
```

Example: Bitwise operators

```
a,b = 10,4
print("a & b =", a & b)
print("a | b =", a | b)
print("~a =", ~a)
print("a ^ b =", a ^ b)
print(' a>> 2 =', a>> 2)
print(' a<< 1 =', a<< 1)
```

Example: Identity operators

```
a,b = 5,5
x2 = 'Hello'
y2 = x2
print(a is not b)
print(x2 is y2)
```

Example: Membership operators

```
x = 'Hello world'
v=[1,2,3,4,5]
m=8
print('H' in x)
print('ll' in x)
print('eo' not in x)
print(m in v)
```

Example: Precedence of Python Operator

```
a,b,c,d,e = 20,10,15,5,0
e = (a + b) * c / d
print ("e= ", e)
e = ((a + b) * c) / d
print ("e= ", e)
e = (a + b) * (c / d)
print ("e= ", e)
e = a + (b * c) // d;
print ("e= ", e)
m= 10 - 4 * 2
print ("m= ", m)
m= (10 - 4) * 2
print ("m= ", m)
print (2 ** 3 ** 2)
print((2 ** 3) ** 2)
```

Example: Handling Exceptions with Try/Except

```
try:
    a = 10
    b = 0
    result = a/b
    print(result)

except :
  print("Error: b cannot be 0.")
```

Example: Handling Exceptions with Try/Except

```
try:
    a = 10
    b = 0
    result = a/b
    print(result)
except: ValueError as e:
 print(e)
```