Programs on Loops

January 20, 2023

[2]:
```
for i in range(1, 11):
    print(i, end=' ')
```

```
1 2 3 4 5 6 7 8 9 10
```

[3]:
```
r = range(1, 11)
for i in r:
    print(i, end=' ')
```

```
1 2 3 4 5 6 7 8 9 10
```

[4]:
```
lst = [10, 20, 30]
for i in lst:
    print(i, end = ' ')
```

```
10 20 30
```

[7]:
```
# Generate all the n multiples upto z
# n = 7, z = 40
# 7 14 21 35
n = int(input())
z = int(input())
for i in range(n, z, n):
    print(i, end = ' ')
```

```
12
100
12 24 36 48 60 72 84 96
```

[9]:
```
# find out the sum of n natural numbers
# n = 5
# 1 2 3 4 5 --> 1 + 2 + 3 + 4 + 5 = 15
n = int(input())
s = 0
for i in range(1, n + 1):
    s += i
print(s)
```

```
5
15
```

[13]:
```
# find out the sum of n natural numbers
# n = 5
# 1 2 3 4 5 --> 1 + 2 + 3 + 4 + 5 = 15
n = int(input())
print(sum(range(1, n + 1)))
```

```
7
28
```

[10]:
```
lst = [10, 20]
print(sum(lst))
```

```
30
```

[11]:
```
_tuple = (1, -1, 0, 1, 1)
print(sum(_tuple))
```

```
2
```

[12]:
```
print(sum(range(1, 6)))
```

```
15
```

[15]:
```
# find out the product of n natural numbers
# n = 5
# 1 2 3 4 5 --> 1 x 2 x 3 x 4 x 5 = 15
n = int(input())
p = 1
for i in range(1, n + 1):
    p *= i # p = p * i
print(p)
```

```
7
5040
```

[23]:
```
n = int(input())
sum1 = sum2 = 0
for i in range(1, n + 1):
    sum1 += i**2 # sum of squares of n natural numbers
    sum2 += i # sum of n natural numbers
sum2 **= 2
print(abs(sum1 - sum2**2))
# print(sum2-sum1 if sum2 > sum1 else sum1-sum2)
```

```
5
170
```

[19]:
```
abs(10)
```

[19]: 10

[20]:
```
abs(-10)
```

[20]: 10

[27]:
```
# print all the even numbers in a given range
# 10 20
# 10 12 14 16 18 20
a, b = map(int, input().split())
for i in range(a, b + 1):
    if i % 2 == 0:
        print(i, end=' ')
```

```
1 10
2 4 6 8 10
```

[29]:
```
# factors of a given number
# n = 10
# 1 2 5 10
# 1 2 5 10
n = int(input())
for i in range(1, n + 1):
    if n % i == 0:
        print(i, end=' ')
```

```
10
1 2 5 10
```

[36]:
```
# prime or not
# 2 --> 1, 2
# 3 --> 1, 3
# 5 --> 1, 5
# 7 --> 1, 7
# 8 --> 1, 2, 4, 8
# 4 --> 1, 2, 4
n = int(input())
fc = 0
for i in range(1, n + 1):
    if n % i == 0:
        fc += 1
if fc == 2:
    print("Prime")
else:
    print("Not a prime")
```

```
14
Not a prime
```

1 Looping control statements

- break
- continue

1.1 break

[38]:
```
for i in range(1, 11):
    print(i, end=' ')
    break # unconditional break
```

```
1
```

[47]:
```
for i in range(1, 11):
    break # unconditional break
    print(i, end=' ')
```

[48]:
```
for i in range(10, 100, 10):
    print(i, end=' ') # 10 20 30 40 50
    if i % 25 == 0: # 50 % 25 == 0
        break
```

```
10 20 30 40 50
```

[49]:
```
for i in range(10, 100, 10):
    if i % 25 == 0: # 50 % 25 == 0
        break
    print(i, end=' ') # 10 20 30 40
```

```
10 20 30 40
```

[ ]:
```
# LCM of two given numbers
# 12 18 --> 36
# Least Common Multiple
# 12 --> 12 24 36 48 60 72 84 96 108.....
# 18 --> 18 36 54 72 90 108......
# CM --> 36 72 108.....
# LCM --> 36
```

[51]:
```
a, b = map(int, input().split())
i = 1
while 1:
    m = a * i
    if m % b == 0:
        print(f'LCM of {a} and {b} is {m}')
        break
    i += 1
```

```
5 7
LCM of 5 and 7 is 35
```

1.2 continue

- continue is used to skip the current iteration
- wherever the continue statement is encountered the control goes back to the loop with out executing any subsequent lines of code

[54]:
```
for i in range(1, 11):
    if i == 5:
        continue
    print(i, end=' ')
```

```
1 2 3 4 6 7 8 9 10
```

[55]:
```
for i in range(1, 11):
    if i % 2 == 0:
        continue
    print(i, end=' ')
```

```
1 3 5 7 9
```

[56]:
```
for i in range(1, 51):
    if i % 5 != 0:
        continue
    print(i, end=' ')
```

```
5 10 15 20 25 30 35 40 45 50
```

1.3 pass

[72]:
```
age = 17
if age > 18:
    pass
else:
    print("You are not eligible to vote!")
```

```
You are not eligible to vote!
```

[73]:
```
for i in range(1, 11):
    pass
print(i)
```

```
10
```

2 Dealing with the digits

[ ]:
```
n = int(input()) # n = 12479
s = 0
for i in str(n):
    s += int(i)
print(s)
```

[ ]:
```
'12479'
'1' '2' '4' '7' '9'
```

[71]:
```
n = int(input()) # n = 12479
edigit = odigit = 0
for i in str(n):
    if int(i)%2 == 0:
        edigit += 1
    else:
        odigit += 1
print(f"Even digits: {edigit}")
print(f"Odd digits: {odigit}")
```

```
1111
Even digits: 0
Odd digits: 4
```