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Display Patterns in Python

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Abstract : Patterns can be printed in python using simple for loops. First outer loop is used to handle number of rows and Inner nested loop is used to handle the number of columns. Manipulating the print statements, different number patterns, alphabet patterns or star patterns can be printed. Some of the Patterns are shown in this paper.

I. INTRODUCTION

Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. Its high-level built in data structures, combined with dynamic typing and dynamic binding, make it very attractive for Rapid Application Development, as well as for use as a scripting or glue language to connect existing components together. Python's simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. In this paper we are displaying the patterns in different shapes.

II. PROGRAMS

Program 1:

```
rows = 6
for i in range(rows):
for j in range(i):
print(i, end=' ')
print("")
```

IDLE Shell 3.10.1

```
File Edit Shell Debug Options Window Help
Python 3.10.1 (tags/v3.10.1:2cd268a, Dec
AMD64) on win32
Type "help", "copyright", "credits" or '
>>>
==== RESTART: C:/Users/IT/AppData/Local,
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
```

Program 2:

```
rows = 5
for i in range(1, rows + 1):
for j in range(1, i + 1):
print(j, end=' ')
print("")
```

```

IDLE Shell 3.10.1
File Edit Shell Debug Options Window
Python 3.10.1 (tags/v3.10.1:
AMD64)] on win32
Type "help", "copyright", "c
>>>
===== RESTART: C:/Users/IT/Ap
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
>>> |

```

Program 3:

```

rows = 5
b = 0
for i in range(rows, 0, -1):
    b += 1
    for j in range(1, i + 1):
        print(b, end=' ')
    print('\r')

```

```

IDLE Shell 3.10.1
File Edit Shell Debug Options Window Help
Python 3.10.1 (tags/v3.10.1:2cd268a,
AMD64)] on win32
Type "help", "copyright", "credits"
>>>
===== RESTART: C:/Users/IT/AppData/Lc
1 1 1 1 1
2 2 2 2
3 3 3
4 4
5
>>> |

```

Program 4:

```

rows = 5
for i in range(1, rows + 1):
    for j in range(1, rows + 1):
        if j <= i:
            print(i, end=' ')
        else:
            print(j, end=' ')
    print()

```

```

IDLE Shell 3.10.1
File Edit Shell Debug Options Window
Python 3.10.1 (tags/v3.10.1:2
AMD64)] on win32
Type "help", "copyright", "cr
>>>
===== RESTART: C:/Users/IT/App
1 2 3 4 5
2 2 3 4 5
3 3 3 4 5
4 4 4 4 5
5 5 5 5 5
>>> |

```

Program 5:

```

rows = 5
for i in range(0, rows):
    for j in range(0, i + 1):
        print("*", end=' ')
    print("\r")

```

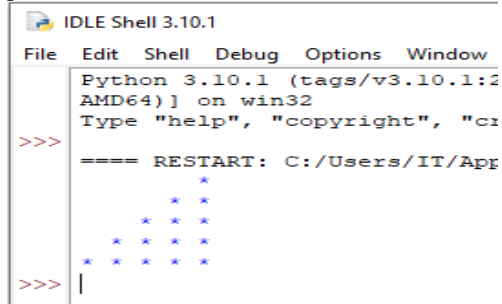
```

IDLE Shell 3.10.1
File Edit Shell Debug Options Window
Python 3.10.1 (tags/v3.10.1:2
AMD64)] on win32
Type "help", "copyright", "cr
>>>
===== RESTART: C:/Users/IT/App
*
* *
* * *
* * * *
* * * * *
>>> |

```

Program 6:

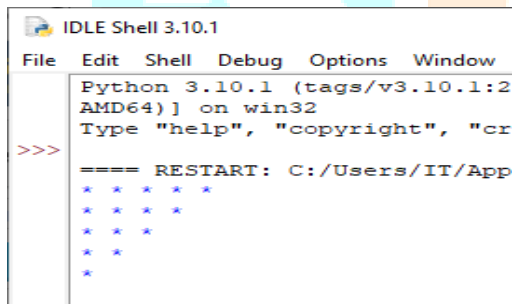
```
rows = 5
k = 2 * rows - 2
for i in range(0, rows):
for j in range(0, k):
print(end=" ")
k = k - 2
for j in range(0, i + 1):
print("* ", end="")
print("")
```



```
IDLE Shell 3.10.1
File Edit Shell Debug Options Window
Python 3.10.1 (tags/v3.10.1:2
AMD64) on win32
Type "help", "copyright", "cr
>>>
==== RESTART: C:/Users/IT/App
*
 *
* *
 * *
* * *
 * *
 *
>>> |
```

Program 7:

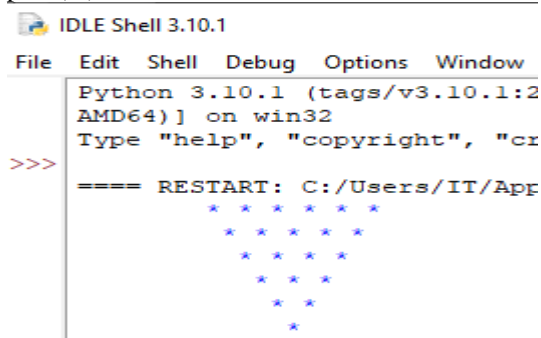
```
rows = 5
for i in range(rows + 1, 0, -1):
for j in range(0, i - 1):
print("*", end=' ')
print(" ")
```



```
IDLE Shell 3.10.1
File Edit Shell Debug Options Window
Python 3.10.1 (tags/v3.10.1:2
AMD64) on win32
Type "help", "copyright", "cr
>>>
==== RESTART: C:/Users/IT/App
* * * * *
* * * *
* * *
* *
*
>>>
```

Program 8:

```
rows = 5
k = 2 * rows - 2
for i in range(rows, -1, -1):
for j in range(k, 0, -1):
print(end=" ")
k = k + 1
for j in range(0, i + 1):
print("*", end=" ")
print("")
```



```
IDLE Shell 3.10.1
File Edit Shell Debug Options Window
Python 3.10.1 (tags/v3.10.1:2
AMD64) on win32
Type "help", "copyright", "cr
>>>
==== RESTART: C:/Users/IT/App
* * * * *
 * * * *
  * * *
   * *
    *
>>>
```

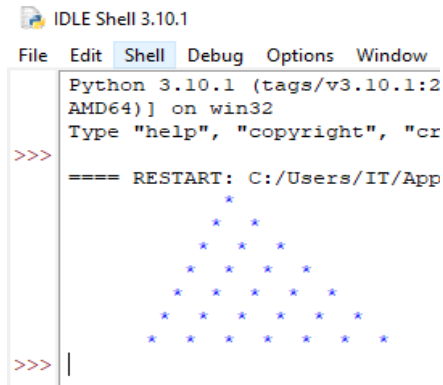
Program 9

```
size = 7
m = (2 * size) - 2
for i in range(0, size):
for j in range(0, m):
print(end=" ")
m = m - 1
```

```

for j in range(0, i + 1):
print("* ", end=' ')
print(" ")

```



```

IDLE Shell 3.10.1
File Edit Shell Debug Options Window
Python 3.10.1 (tags/v3.10.1:2
AMD64) on win32
Type "help", "copyright", "cr
>>>
==== RESTART: C:/Users/IT/App
*
* *
* * *
* * * *
* * * * *
* * * * *
>>>

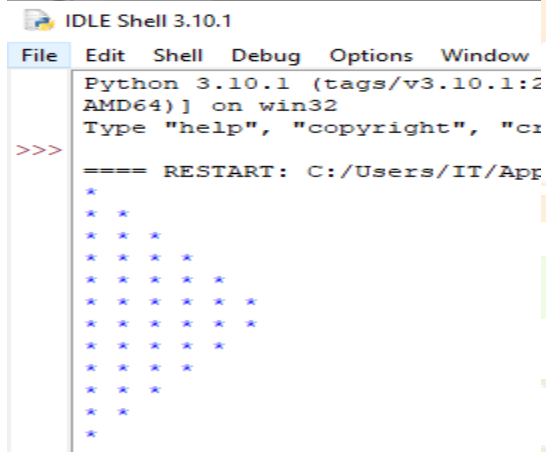
```

Program 10:

```

rows = 6
for i in range(0, rows):
for j in range(0, i + 1):
print("*", end=' ')
print(" ")
for i in range(rows + 1, 0, -1):
for j in range(0, i - 1):
print("*", end=' ')
print(" ")

```



```

IDLE Shell 3.10.1
File Edit Shell Debug Options Window
Python 3.10.1 (tags/v3.10.1:2
AMD64) on win32
Type "help", "copyright", "cr
>>>
==== RESTART: C:/Users/IT/App
*
* *
* * *
* * * *
* * *
* *
*
>>>

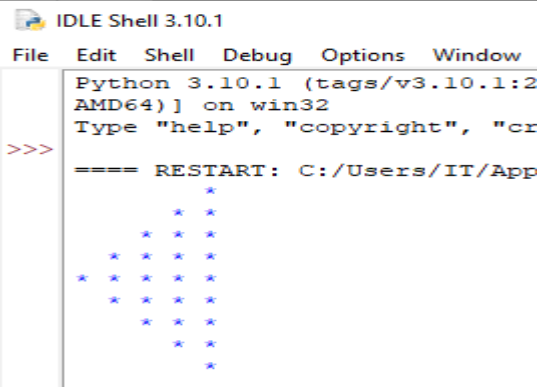
```

Program 11:

```

rows = 5
i = 1
while i <= rows:
j = i
while j < rows:
print(' ', end=' ')
j += 1
k = 1
while k <= i:
print('*', end=' ')
k += 1
print()
i += 1
i = rows
while i >= 1:
j = i
while j <= rows:
print(' ', end=' ')
j += 1
k = 1
while k < i:
print('*', end=' ')
k += 1
print()
i -= 1

```



```

IDLE Shell 3.10.1
File Edit Shell Debug Options Window
Python 3.10.1 (tags/v3.10.1:2
AMD64) on win32
Type "help", "copyright", "cr
>>>
===== RESTART: C:/Users/IT/App
*
 *
* *
* * *
* * * *
 *
 *
 *
 *
 *

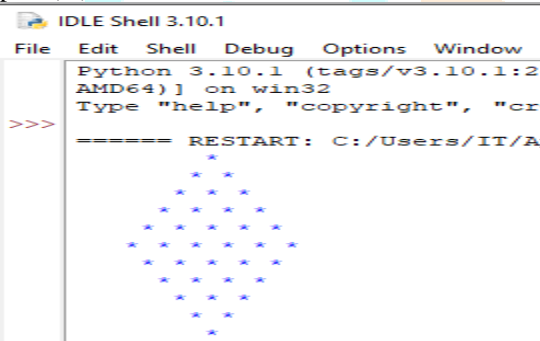
```

Program 12:

```

rows = 5
k = 2 * rows - 2
for i in range(0, rows):
    for j in range(0, k):
        print(end=" ")
        k = k - 1
        for j in range(0, i + 1):
            print("* ", end="")
        print("")
        k = rows - 2
        for i in range(rows, -1, -1):
            for j in range(k, 0, -1):
                print(end=" ")
                k = k + 1
            for j in range(0, i + 1):
                print("* ", end="")
            print("")

```



```

IDLE Shell 3.10.1
File Edit Shell Debug Options Window
Python 3.10.1 (tags/v3.10.1:2
AMD64) on win32
Type "help", "copyright", "cr
>>>
===== RESTART: C:/Users/IT/A
*
 *
* *
* * *
* * * *
 *
 *
 *
 *
 *

```

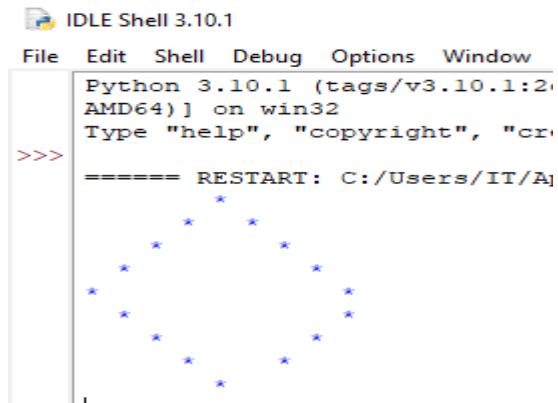
Program 13:

```

rows = 5
i = 1
while i <= rows:
    j = rows
    while j > i:
        print(' ', end=' ')
        j -= 1
    print('*', end=' ')
    k = 1
    while k < 2 * (i - 1):
        print(' ', end=' ')
        k += 1
    if i == 1:
        print()
    else:
        print('*')
    i += 1
    i = rows - 1
    while i >= 1:
        j = rows
        while j > i:
            print(' ', end=' ')
            j -= 1
        print('*', end=' ')
        k = 1
        while k <= 2 * (i - 1):

```

```
print(' ', end=' ')\n k += 1\n if i == 1:\n print()\n else:\n print('*')\n i -= 1
```



III. REFERENCES

- [1] Python Programming, Scitech Publications (India) Pvt. Ltd. ISBN: 9789385983450.
- [2] Learning Python, 5th edition

