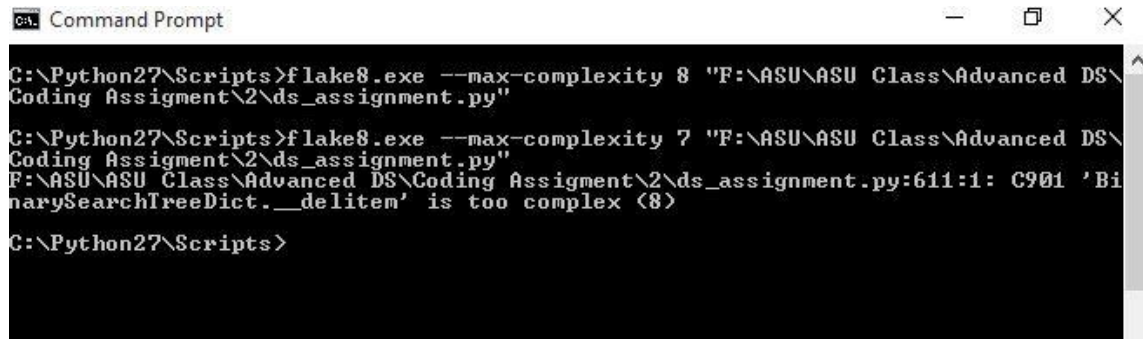


## Example Output:

### Flake OUTPUT:



```
Command Prompt
C:\Python27\Scripts>flake8.exe --max-complexity 8 "F:\ASU\ASU Class\Advanced DS\Coding Assignment\2\ds_assignment.py"
C:\Python27\Scripts>flake8.exe --max-complexity 7 "F:\ASU\ASU Class\Advanced DS\Coding Assignment\2\ds_assignment.py"
F:\ASU\ASU Class\Advanced DS\Coding Assignment\2\ds_assignment.py:611:1: C901 'BinarySearchTreeDict.__delitem' is too complex (8)
C:\Python27\Scripts>
```

Giving the value of `--max-complexity 8` it didn't show anything but at the value 7 it says the function `BinarySearchTreeDict.__delitem` is too complex with the value 8.

Therefore the mccabe complexity is 8.

We can also see that there is no warning messages in the python module.

### Program Output:

The basic output of the programs is shown like insertion, deletion, display and traversal for various data structures.

```
File Edit View Navigate Code Refactor Run Tools VCS Window Help
F:\ASU\ASU Class\Advanced DS\Coding Assignment\2\ds_assignment.py
Run ds_assignment
F:\Python27\python.exe "F:/ASU/ASU Class/Advanced DS/Coding Assignment/2/ds_assignment.py"
-----LINKED LIST OPERATIONS-----
Printing Linked List-> List:45->40->35->30->25->20->15->10->5->0
Deleting 115 if found:
Value not found
After removing 25 list is:
List:45->40->35->30->20->15->10->5->0
-----Terrible Hash operations -----
Key Value
5 15
6 16
None None
None None
None None
0 10
1 11
2 12
3 13
4 14
7 17
8 18
9 19
10 20
11 21
None None
None None
None None
None None
None None
```

ds\_assignment.py - [C:\Users\Abhinav\AppData\Local\Temp\ds\_assignment.py9.tmp] - F:\ASU\ASU Class\Advanced DS\Coding Assignment\2\ds\_assignment.py - PyCharm Community Edition 4.5.3

File Edit View Navigate Code Refactor Run Tools VCS Window Help

F: ASU ASU Class Advanced DS Coding Assignment 2 ds\_assignment.py

Run ds\_assignment

----- OpenAddressHash operation-----

Key	Value
0	10
1	11
2	12
3	13
4	14
5	15
6	16
7	17
8	18
9	19
10	20
11	21
12	22
13	23
14	24
15	25
16	26
17	27
18	28
19	29
20	30
21	31
22	32
23	33
24	34
25	35
26	36
27	37
28	38
29	39
30	40
31	41
32	42

F: ASU ASU Class Advanced DS Coding Assignment 2 ds\_assignment.py

Run ds\_assignment

33	43
34	44
35	45
36	46
37	47
38	48
39	49
40	50
41	51
42	52
43	53
44	54
45	55
46	56
47	57
48	58
49	59
50	60
51	61
52	62
53	63
54	64
55	65
56	66
57	67
58	68
59	69
60	70
61	71
62	72
63	73
64	74
65	75
66	76
67	77
68	78

```
F:\ASU\ASU Class\Advanced DS\Coding Assignment\2\ds_assignment.py
Run ds_assignment
69 79
70 80
71 81
72 82
73 83
74 84
75 85
76 86
77 87
78 88
79 89
80 90
81 91
82 92
83 93
84 94
85 95
86 96
87 97
88 98
89 99
90 100
91 101
92 102
93 103
94 104
95 105
96 106
97 107
98 108
99 109
None None
None None
None None
None None
None None
```

```
File Edit View Navigate Code Refactor Run Tools VCS Window Help
F:\ASU\ASU Class\Advanced DS\Coding Assignment\2\ds_assignment.py
Run ds_assignment
Length of hash is: 100
After deleting 21 the Hash table is
Key Value
0 10
1 11
2 12
3 13
4 14
5 15
6 16
7 17
8 18
9 19
10 20
11 21
12 22
13 23
14 24
15 25
16 26
17 27
18 28
19 29
20 30
del del
22 32
23 33
24 34
25 35
26 36
27 37
28 38
29 39
30 40
```

```
File Edit View Navigate Code Refactor Run Tools VCS Window Help
F: ASU ASU Class Advanced DS Coding Assignment 2 ds_assignment.py
Run ds_assignment
31 41
32 42
33 43
34 44
35 45
36 46
37 47
38 48
39 49
40 50
41 51
42 52
43 53
44 54
45 55
46 56
47 57
48 58
49 59
50 60
51 61
52 62
53 63
54 64
55 65
56 66
57 67
58 68
59 69
60 70
61 71
62 72
63 73
64 74
65 75
66 76
```

```
File Edit View Navigate Code Refactor Run Tools VCS Window Help
F: ASU ASU Class Advanced DS Coding Assignment 2 ds_assignment.py
Run ds_assignment
67 77
68 78
69 79
70 80
71 81
72 82
73 83
74 84
75 85
76 86
77 87
78 88
79 89
80 90
81 91
82 92
83 93
84 94
85 95
86 96
87 97
88 98
89 99
90 100
91 101
92 102
93 103
94 104
95 105
96 106
97 107
98 108
99 109
None None
None None
None None
```

ds\_assignment.py - (C:\Users\Admin\AppData\Local\Temp\ds\_assignment.py.tmp) - F:\ASO\ASO Class\Advanced DS\Coding Assignment\ds\_assignment.py - PyCharm Community

```
File Edit View Navigate Code Refactor Run Tools VCS Window Help
F: ASU ASU Class Advanced DS Coding Assignment 2 ds_assignment.py
Run ds_assignment

----- ChainedHash operation-----

0: (90,100)->(80,90)->(70,80)->(60,70)->(50,60)->(40,50)->(30,40)->(20,30)->(10,20)->(0,10)->NULL
1: (91,101)->(81,91)->(71,81)->(61,71)->(51,61)->(41,51)->(31,41)->(21,31)->(11,21)->(1,11)->NULL
2: (92,102)->(82,92)->(72,82)->(62,72)->(52,62)->(42,52)->(32,42)->(22,32)->(12,22)->(2,12)->NULL
3: (93,103)->(83,93)->(73,83)->(63,73)->(53,63)->(43,53)->(33,43)->(23,33)->(13,23)->(3,13)->NULL
4: (94,104)->(84,94)->(74,84)->(64,74)->(54,64)->(44,54)->(34,44)->(24,34)->(14,24)->(4,14)->NULL
5: (95,105)->(85,95)->(75,85)->(65,75)->(55,65)->(45,55)->(35,45)->(25,35)->(15,25)->(5,15)->NULL
6: (96,106)->(86,96)->(76,86)->(66,76)->(56,66)->(46,56)->(36,46)->(26,36)->(16,26)->(6,16)->NULL
7: (97,107)->(87,97)->(77,87)->(67,77)->(57,67)->(47,57)->(37,47)->(27,37)->(17,27)->(7,17)->NULL
8: (98,108)->(88,98)->(78,88)->(68,78)->(58,68)->(48,58)->(38,48)->(28,38)->(18,28)->(8,18)->NULL
9: (99,109)->(89,99)->(79,89)->(69,79)->(59,69)->(49,59)->(39,49)->(29,39)->(19,29)->(9,19)->NULL

Length of chained hash is : 100

After deleting values in multiple of 7 the hash is

0: (90,100)->(80,90)->(60,70)->(50,60)->(40,50)->(30,40)->(20,30)->(10,20)->NULL
1: (81,91)->(71,81)->(61,71)->(51,61)->(41,51)->(31,41)->(11,21)->(1,11)->NULL
2: (82,102)->(72,82)->(62,72)->(52,62)->(32,42)->(22,32)->(12,22)->(2,12)->NULL
3: (93,103)->(83,93)->(73,83)->(53,63)->(43,53)->(33,43)->(23,33)->(13,23)->(3,13)->NULL
4: (94,104)->(74,84)->(64,74)->(54,64)->(44,54)->(34,44)->(24,34)->(4,14)->NULL
5: (95,105)->(85,95)->(75,85)->(65,75)->(55,65)->(45,55)->(25,35)->(15,25)->(5,15)->NULL
6: (96,106)->(86,96)->(76,86)->(66,76)->(46,56)->(36,46)->(26,36)->(16,26)->(6,16)->NULL
7: (97,107)->(87,97)->(67,77)->(57,67)->(47,57)->(37,47)->(27,37)->(17,27)->NULL
8: (88,98)->(78,88)->(68,78)->(58,68)->(48,58)->(38,48)->(18,28)->(8,18)->NULL
9: (99,109)->(89,99)->(79,89)->(69,79)->(59,69)->(39,49)->(29,39)->(19,29)->(9,19)->NULL
```

```
-----Binary Tree Operations-----

Length of tree is : 9

Using Tree Display function :
Inorder Tree Traversal: [[-2, 'XYZ'], [-1, 'GHI'], [1, 'ASU'], [2, 3], [3, 'POR'], [4, 5], [5, 'SIL'], [6, 'MNO'], [7, 'ABC']]
Preorder Tree Traversal: [[2, 3], [1, 'ASU'], [-2, 'XYZ'], [-1, 'GHI'], [3, 'POR'], [4, 5], [5, 'SIL'], [7, 'ABC'], [6, 'MNO']]

Using Tree items functions:
Inorder Tree Traversal: [[-2, 'XYZ'], [-1, 'GHI'], [1, 'ASU'], [2, 3], [3, 'POR'], [4, 5], [5, 'SIL'], [6, 'MNO'], [7, 'ABC']]

Height of B-tree is: 6

Inorder Tree Traversal: [[-2, 'XYZ'], [-1, 'GHI'], [1, 'ASU'], [2, 3], [3, 'POR'], [4, 5], [5, 'SIL'], [6, 'MNO'], [7, 'ABC']]

Postorder Tree Traversal: [[-1, 'GHI'], [-2, 'XYZ'], [1, 'ASU'], [6, 'MNO'], [7, 'ABC'], [5, 'SIL'], [4, 5], [3, 'POR'], [2, 3]]

Preorder Tree Traversal: [[2, 3], [1, 'ASU'], [-2, 'XYZ'], [-1, 'GHI'], [3, 'POR'], [4, 5], [5, 'SIL'], [7, 'ABC'], [6, 'MNO']]
Key found: 2 value = 3 and deleted

After deleting 2 the binary tree is :

Inorder traversal of tree after deleting node 2 is: [[-2, 'XYZ'], [-1, 'GHI'], [1, 'ASU'], [3, 'POR'], [4, 5], [5, 'SIL'], [6, 'MNO'], [7, 'ABC']]

Process finished with exit code 0
```