

CNS Lab Assignment 3: Tools

111703013 Akshay Deodhar

Code

1 GCD

```
1
2 from sys import argv, stderr
3
4 def gcd(a, b):
5     small = min(a, b)
6     big = max(a, b)
7
8     if small == 0:
9         return big
10
11     return gcd(big % small, small)
12
13
14 if __name__ == "__main__":
15
16     n = len(argv)
17
18     if n != 3:
19         print("usage: python3 gcd.py <num1> <num2>", file = stderr)
20         exit(1)
21
22
23     __, a, b = argv
24     a = int(a)
25     b = int(b)
26
27     print("GCD({0}, {1}) = {2} ".format(a, b, gcd(a, b)))
```

2 Modulo

```
1
2
3
4 from sys import argv, stderr
5
6
7 if __name__ == "__main__":
8
9     n = len(argv)
10
11     if n != 3:
12         print("usage: python3 mod.py <num1> <num2>", file = stderr)
13         exit(1)
14
```

```

15
16     __, a, b = argv
17     a = int(a)
18     b = int(b)
19
20     print("{0} % {1} = {2}".format(a, b, a % b))

```

3 Shift

```

1
2 from sys import argv, stderr
3
4
5 if __name__ == "__main__":
6
7     n = len(argv)
8
9     if n != 4:
10         print("usage: python3 mod.py <num1> <dir> <bits>", file = stderr)
11         exit(1)
12
13
14     __, n, direction, bits = argv
15     n = int(n)
16     bits = int(bits)
17
18     if direction not in ['L', 'R']:
19         print("Invalid direction {}".format(direction))
20
21
22     if direction == 'L':
23         print("{0} << {1} = {2}".format(n, bits, n << bits))
24     else:
25         print("{0} >> {1} = {2}".format(n, bits, n >> bits))

```

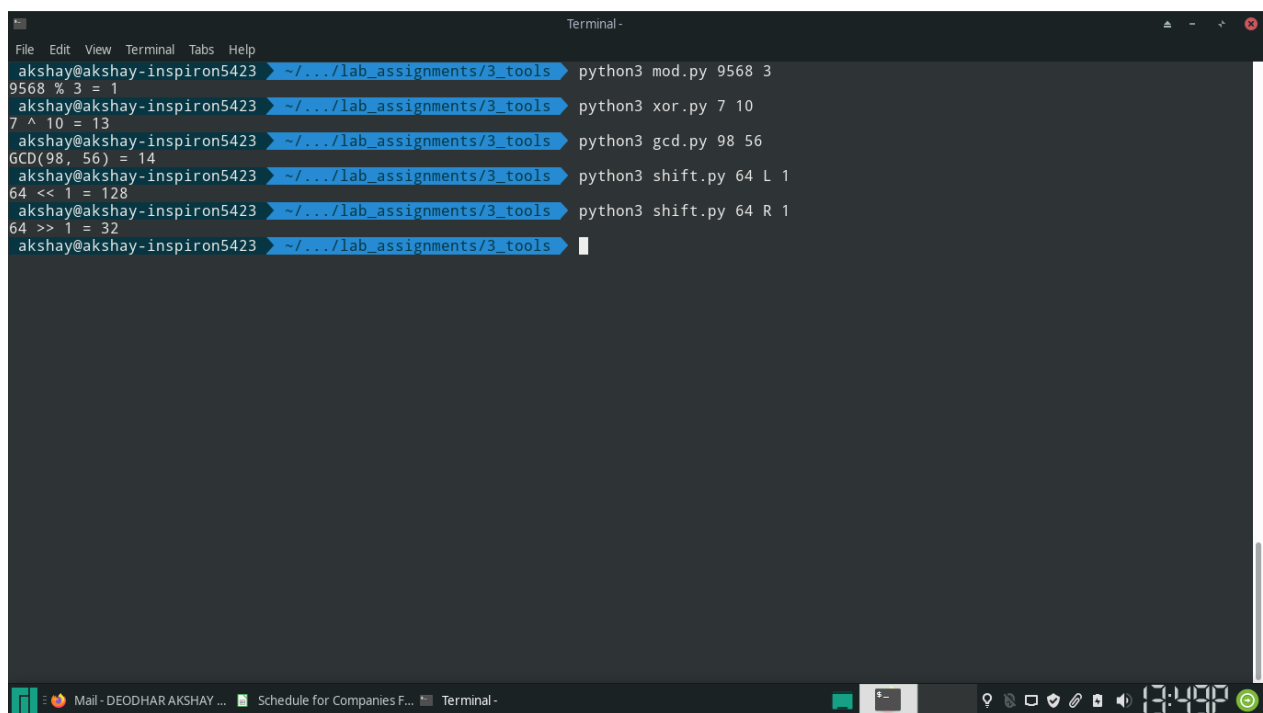
4 XOR

```

1
2
3 from sys import argv, stderr
4
5
6 if __name__ == "__main__":
7
8     n = len(argv)
9
10    if n != 3:
11        print("usage: python3 xor.py <num1> <num2>", file = stderr)
12        exit(1)
13
14
15    __, a, b = argv
16    a = int(a)
17    b = int(b)
18
19    print("{0} ^ {1} = {2}".format(a, b, a ^ b))

```

Output



```
File Edit View Terminal Tabs Help
akshay@akshay-inspiron5423 ~/.../lab_assignments/3_tools python3 mod.py 9568 3
9568 % 3 = 1
akshay@akshay-inspiron5423 ~/.../lab_assignments/3_tools python3 xor.py 7 10
7 ^ 10 = 13
akshay@akshay-inspiron5423 ~/.../lab_assignments/3_tools python3 gcd.py 98 56
GCD(98, 56) = 14
akshay@akshay-inspiron5423 ~/.../lab_assignments/3_tools python3 shift.py 64 L 1
64 << 1 = 128
akshay@akshay-inspiron5423 ~/.../lab_assignments/3_tools python3 shift.py 64 R 1
64 >> 1 = 32
akshay@akshay-inspiron5423 ~/.../lab_assignments/3_tools
```

Figure 1: Output of execution of each of the functions, from the command line