Welcome to the Module 3, System Administration. In this sub-section we'll be discussing Python. In this final session, we will discuss practical uses for Python.
This training material was originally developed to help students, teachers, and mentors prepare for the Cyber Aces Online Competition. This module focuses on the basics of system administration and scripting. This session is part of Module 3, System Administration. This module is split into three sections, Bash, PowerShell, and Python. In this session, we will continue our examination of Python.

The three modules of Cyber Aces Online are Operating Systems, Networking, and System Administration.

For more information about the Cyber Aces program, please visit the Cyber Aces website at https://CyberAces.org/.
In this session, we will discuss some practical uses of Python.
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Write a script that will take an integer (base 10) and display the hex and binary equivalent. Your code should make sure it is an integer before converting. The number should be given as a command line argument. If the argument is missing, or there are too many, your code should show an error message. Hint: You will need to use `bin()` and `hex()`

Example:

```
$ ./convert.py 997
0x3e5
0b111100101
```

Write a script that will take an integer (base 10) and display the hex and binary equivalent. Your code should make sure it is an integer before converting. The number should be given as a command line argument. If the argument is missing, or there are too many, your code should show an error message. Hint: You will need to use `bin()` and `hex()`

Example:

```
$ ./convert.py 1001
0x3e9
0b1111101001
```
2. Numbers in a File

We start with a text file containing four lines:
John Doe 90
Jane Doe 89
Amy Herning 99
Freak Bean 97

There is a space between each field and no leading or trailing space.
The file name is provided as a command line argument, display an error if the argument is missing.
Goal: Print the top score, bottom score, and the average.

Output:
$ ./score.py scores.txt
Top: 99
Bottom: 89
Average: 93.75
In many games the dice used during a portion of the game are described as 3d6
- Three dice
- Six sided
Your goal is to take input in the format, then give the output
Hint: Use the "random" module and the "randint" method

Example:
$ ./roller.py
What would you like to roll? 3d6
Rolling 3, 6 sided dice with a result of 12
What would you like to roll? 2d12
Rolling 2, 12 sided dice with a result of 13
What would you like to roll? 10d4
Rolling 10, 4 sided dice with a result of 23
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1. Converting Numbers
Possible Solution

```python
#!/usr/bin/env python3
import sys

if len(sys.argv) != 2:
    print('Invalid number of arguments!')
    sys.exit()

x = sys.argv[1]
if not x.isdigit():
    print('Not a number')
    sys.exit()

i = int(x)
print(hex(i))
print(bin(i))
```

Below is one possible solution

```python
#!/usr/bin/env python3
import sys

if len(sys.argv) != 2:
    print('Invalid number of arguments!')
    sys.exit()

x = sys.argv[1]
if not x.isdigit():
    print('Not a number')
    sys.exit()

i = int(x)
print(hex(i))
print(bin(i))
```
Possible solution

#!/usr/bin/env python3
import sys

if len(sys.argv) != 2:
    print('Invalid number of arguments!')
    sys.exit()

max = -1
min = 99999
total = 0
count = 0

with open(sys.argv[1], 'r') as f:
    for line in f:
        score = int(line.split()[-1])
        total += score
        count += 1
        if score > max:
            max = score
        if score < min:
            min = score

print('Top: ' + str(max))
print('Bottom: ' + str(min))

print('Average: ' + str(total/count))

print('Average: ' + str(total/count))
One possible solution is here:

```python
#!/usr/bin/env python3
import random

while True:
    s = input('What would you like to roll? ')
    x = s.split('d')
    if len(x) != 2:
        print('Invalid input')
        continue

    num = x[0]
    if not num.isdigit():
        print('Invalid input')
        continue

    size = x[1]
    if not size.isdigit():
        print('Invalid input')
        continue

    total = 0
    for i in range(int(num)):
        total += random.randint(1, int(size))

    print('Rolling ' + num + ', ' + size + ' sided dice with a result of ' + str(total))
```
with a result of ' + str(total))
Module 3 - System Administration
Python

• Syntax & Data Types
• Flow Control
• Building a Script

We've completed our discussion of Python. If you've followed the sessions in order, you've completed not only Module 3, System Administration, but all of the Cyber Aces Modules!
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