

CYSE 250 Basic Cybersecurity Programming Topics

- **Programming language** – The language that a computer can understand.
- **Algorithm** – It is a particular set of well-defined instructions to solve a given problem in programming.
- **Syntax** – Rules that tell how to put words and symbols together to create a program.
 - Syntax error

Python:

PyCharm editor (Community free version)

- # - Comments
- End = ' ' or "" – creates things to be on the same line right after each other
- Print() – prints a new line by default
- Int()
- Str()

Variables in Python:

- Integer
- Float
- String
- List
- Tuple

Input()

Strings

- Sequence of characters
- Immutable
- May be accessed with a bracket operator to extract characters at index
- Len() – length
- "" or ''

Lists

- Can be any type
- Container
- Elements can be different
- Mutable
- Item
- Square brackets []
- Assigned positions or index
- Negative indexing
- Slicing
- .append()
- .extend()

- .insert(,)
- .remove()
- .pop()
- .sort()
- .reverse()
- .index()
- .count()
- Entire list = [:]

Tuple

- Like lists
- Cannot alter contents
- Immutable
- Values stored can be any type
- Elements indexed starting at 0
- Round brackets ()
- Simpler
- Takes up a lot of storage
- Quicker to access

Function in Python

Function – A reusable code that takes argument(s) as input, completes a computation, then returns a result.

- Avoids repetition
- Defined using def keyword
- After def you can call the function with name, parenthesis, and argument.

Syntax: def function_name(parameters):

Built-in-functions – Functions built into Python.

User-defined functions – Functions that are defined by the user.

- Return statement

Modules

- File containing a set of functions that you want to include in your application.
- Organize Python code
- File consisting of Python code
- Import keyword
- From keyword

If statement

- If an expression is true or false
- If true, the “if” statement executes
- It will execute a block of code if the particular condition is equal to true

if expression:

statement_1

statement_2

If Else statement

if expression:

statement_1

statement_2

....

Else:

statement_3

statement_4

....

- If elif else
- Nested-If
- is and ==

Loops

- Repetition statements that repeat an action
- Each action is a pass or iteration
- **Definite iteration** – repeats action a predefined number of times
- **Indefinite iteration** – action performs until the program determines it needs to stop
- **While loop** – indefinite iteration, executes a block of statements repeatedly until the condition is satisfied
- Break
- For loop
- Nested for loop

Socket programming

- **Socket** – An endpoint for communication between two devices.
- **Syntax:**
import socket
s = socket.socket(socket.AF_INET, socket.SOCK_STREAM)
- Bound to a port number
- https:// - secure
- http:// - not secure

1. Server and client
2. Secure chat
3. File transfer
4. Generate the query

- socket()
- bind()

- listen()
 - accept()
 - connect()
 - connect_ex()
 - send()
 - recv()
 - close()
- Client
 - Server
 - .encode send requirement
 - .decode receive requirement