1 . Write a simple "Hello World" program in two different programming languages of your choice. Compare the structure and syntax.

Hello, World!" in Python and C language

 # Python program to print "Hello, World!"

print("Hello, World!")

C program

#include <stdio.h>

int main()

{

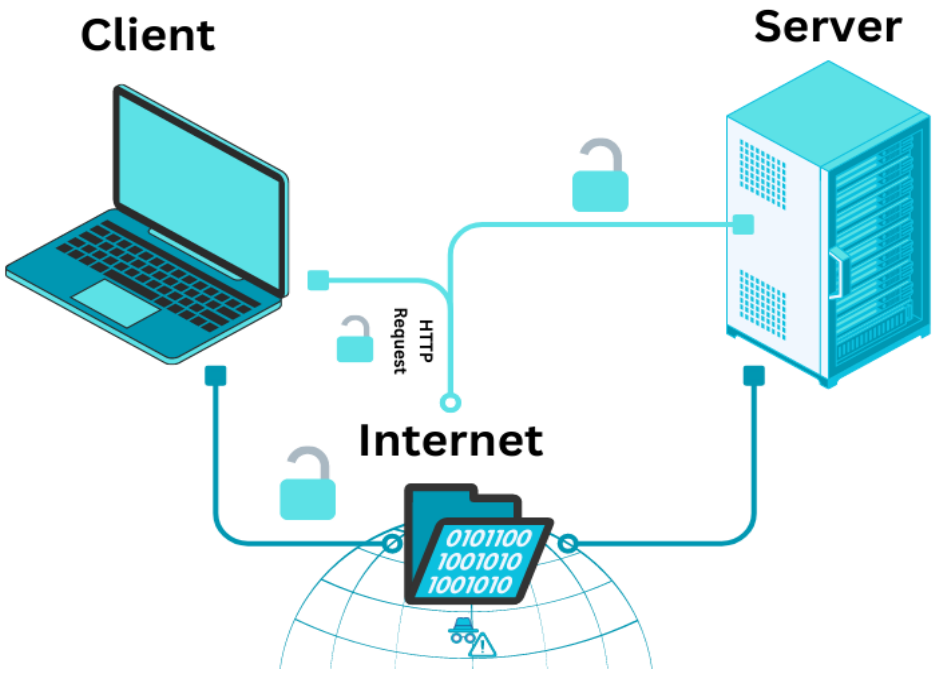
printf("Hello, World!\n");

return 0;

}

Feature	*C*	*Python*
Code Simplicity	*Requires detailed structure with headers and explicit functions.*	*Very simple; focuses on direct execution.*
Mandatory Headers	*Requires #include <stdio.h> for I/O functions.*	*No headers needed for basic operations.*
Main Function	*Requires int main() as the entry point.*	*No explicit main function is needed.*
Output Function	*Uses printf for formatted output.*	*Uses print, which automatically formats the output.*
End of Statements	*Requires a semicolon (;) to terminate each statement.*	*No semicolons; statements are newline-delimited.*

2. Research and create a diagram of how data is transmitted from a client to a server over the internet.



Research different types of internet connections (e.g., broadband, fiber, satellite) and list their pros and cons.

Types of Internet Connections and Their Pros & Cons

1. Broadband (DSL & Cable)

- ***Pros:***
    - *Widely available in urban and suburban areas*
    - *Reliable connection for browsing and streaming*
    - *More affordable than fiber*
- ***Cons:***
    - *Speed depends on distance from the provider's infrastructure*
    - *Can slow down during peak usage hours*

2. Fiber-Optic Internet

- ***Pros:***
    - *Extremely fast speeds (up to 1 Gbps or more)*
    - *Low latency, ideal for gaming and video conferencing*
    - *More stable than DSL or cable*
- ***Cons:***
    - *Limited availability, mainly in cities*
    - *Higher installation costs*

3. Satellite Internet

- ***Pros:***
    - *Available in remote and rural areas*
    - *Doesn't rely on local infrastructure like cables*
- ***Cons:***
    - *High latency, making it less ideal for gaming and video calls*
    - *Weather can affect signal quality*
    - *Data caps and high costs compared to other options*

4. Mobile Internet (4G/5G)

- ***Pros:***
    - *Portable and accessible anywhere with network coverage*
    - *5G offers fast speeds comparable to broadband*
- ***Cons:***
    - *Dependent on signal strength and network congestion*
    - *Data limits and high costs for unlimited plans*

5. Fixed Wireless Internet

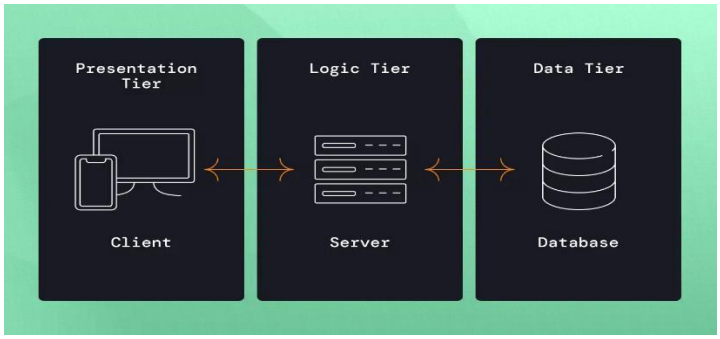
- ***Pros:***
    - *Good option for rural areas without fiber or cable access*
    - *Faster than satellite, with lower latency*
- ***Cons:***
    - *Requires line-of-sight to a tower for a strong connection*

- *Weather conditions can affect performance*

Identify and classify 5 applications you use daily as either system software or application software.

Application	***Type***	
Windows/macOS/Linux	***System Software***	*Operating systems manage hardware resources and provide a platform for applications.*
Google Chrome	***Application Software***	*A web browser used for accessing the internet and web-based services.*
Microsoft Word	***Application Software***	*A word processor used for document creation and editing.*
File Explorer/Finder	***System Software***	*Manages files and directories, providing a graphical interface for file operations.*
Spotify	***Application Software***	*A media streaming app used for playing music and podcasts.*

Design a basic three-tiersoftware architecture diagram for a web application.



Functional Analysis of Online Shopping System

Perform a functional analysis for an online shopping system.

1. ***User Registration and Login:***
    - *Users can create and log into accounts for secure access to personal information and order history.*
2. ***Product Catalog and Search:***
    - *Display of product categories with search and filter options for easy browsing and discovery.*
3. ***Product Details:***
    - *Detailed information, images, and reviews to help users make informed purchase decisions.*
4. ***Shopping Cart:***
    - *Users can add/remove products, view total cost, and apply discounts before checkout.*
5. ***Checkout Process:***
    - *Collects shipping, billing, and payment information to complete the purchase.*
6. ***Order Confirmation and Tracking:***
    - *Confirmation emails sent with order details and tracking options for delivery status.*
7. ***Payment Gateway:***
    - *Secure processing of payments through various methods (cards, wallets, etc.).*
8. ***User Profile and Order History:***
    - *Manage personal information and view past orders with reorder options.*

Design a basic system architecture for a food delivery app.

- ***User Interface (UI):***
- *Front-end application for customers and delivery personnel (mobile/web app).*
- *Allows customers to browse menus, place orders, and track deliveries.*
- ***Authentication Module:***
- *User login and registration (customers, restaurants, delivery agents).*
- *Role-based access control for different users.*
- ***Order Management System:***

- *Handles order creation, tracking, and updates.*
- *Manages communication between customers, restaurants, and delivery agents.*
- ***Restaurant Database:***
- *Stores restaurant profiles, menus, pricing, and availability.*
- *Provides real-time updates to customers on order status.*
- ***Payment Gateway:***
- *Secure integration for processing payments (credit cards, wallets, etc.).*
- *Ensures transaction success or failure notifications.*
- ***Delivery Management System:***
- *Manages delivery agent assignments and route optimization.*
- *Tracks delivery progress and provides updates to customers.*
- ***Push Notification System:***
- *Sends updates to customers and delivery agents (order status, promotions).*

Create a DFD for a hospital management system.