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# Module : 1

## Overview of IT industry

### ❖ Lab exercise

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

Ans. #include<stdio.h>

```
int main()
{
    printf("Hello world !!!");
return 0;
}
```

❖ Explanation:

#include: preprocessor command

stdio.h:standard input output header file

int main(): int main() where the execution of the program begins.

printf():Use printf() to print “Hello World” to the console.

return 0:return 0 indicates the program ended successfully.

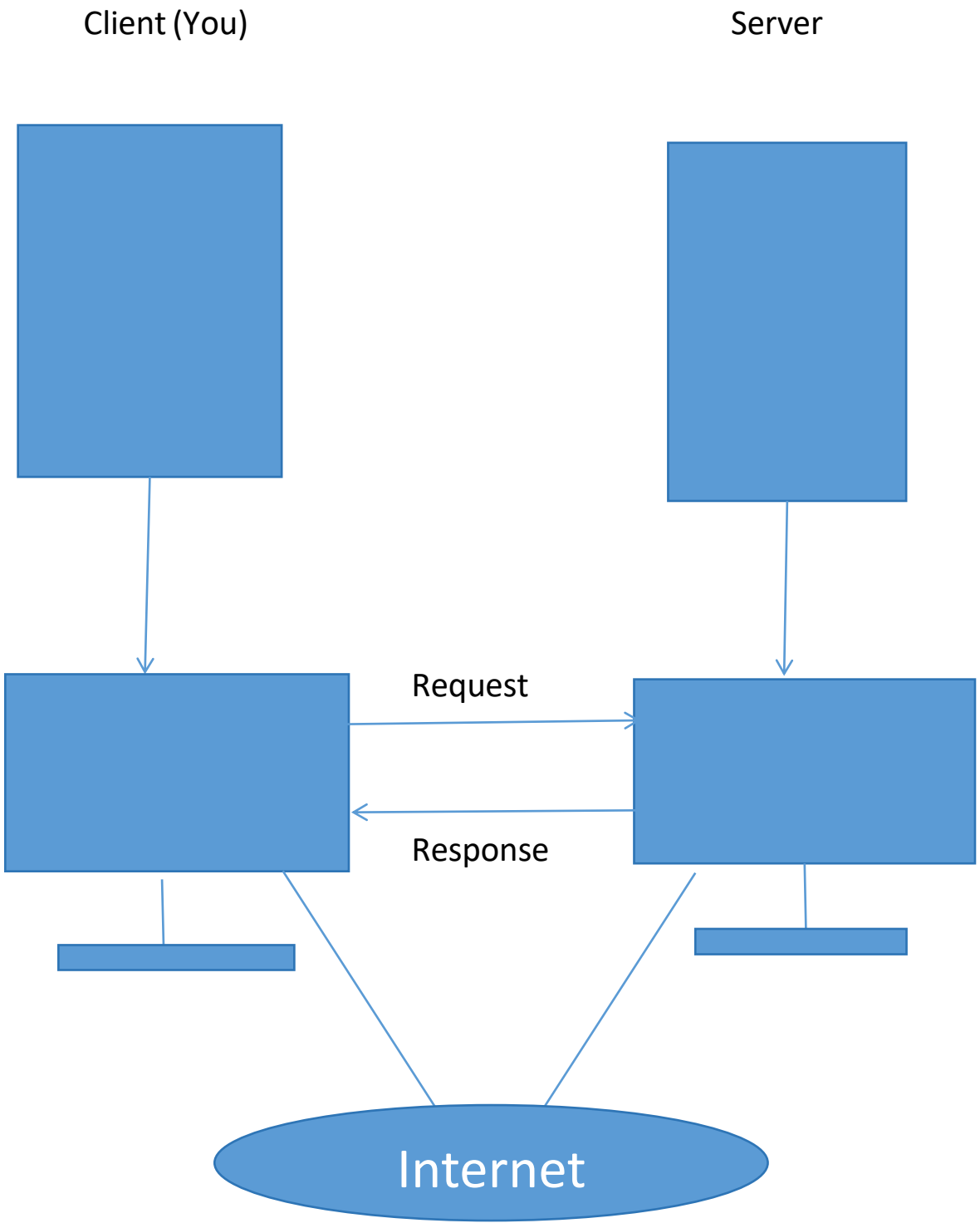
**(2) World Wide Web & How Internet Works**

Ans:

- The internet is a type of world-wide computer network.
- The internet is the collection of infinite numbers of connected computers that are spread across the world.
- When 2 computers are connected over the internet, they can send and receive all kinds of information such as text, graphics, voice, video and computer programs.

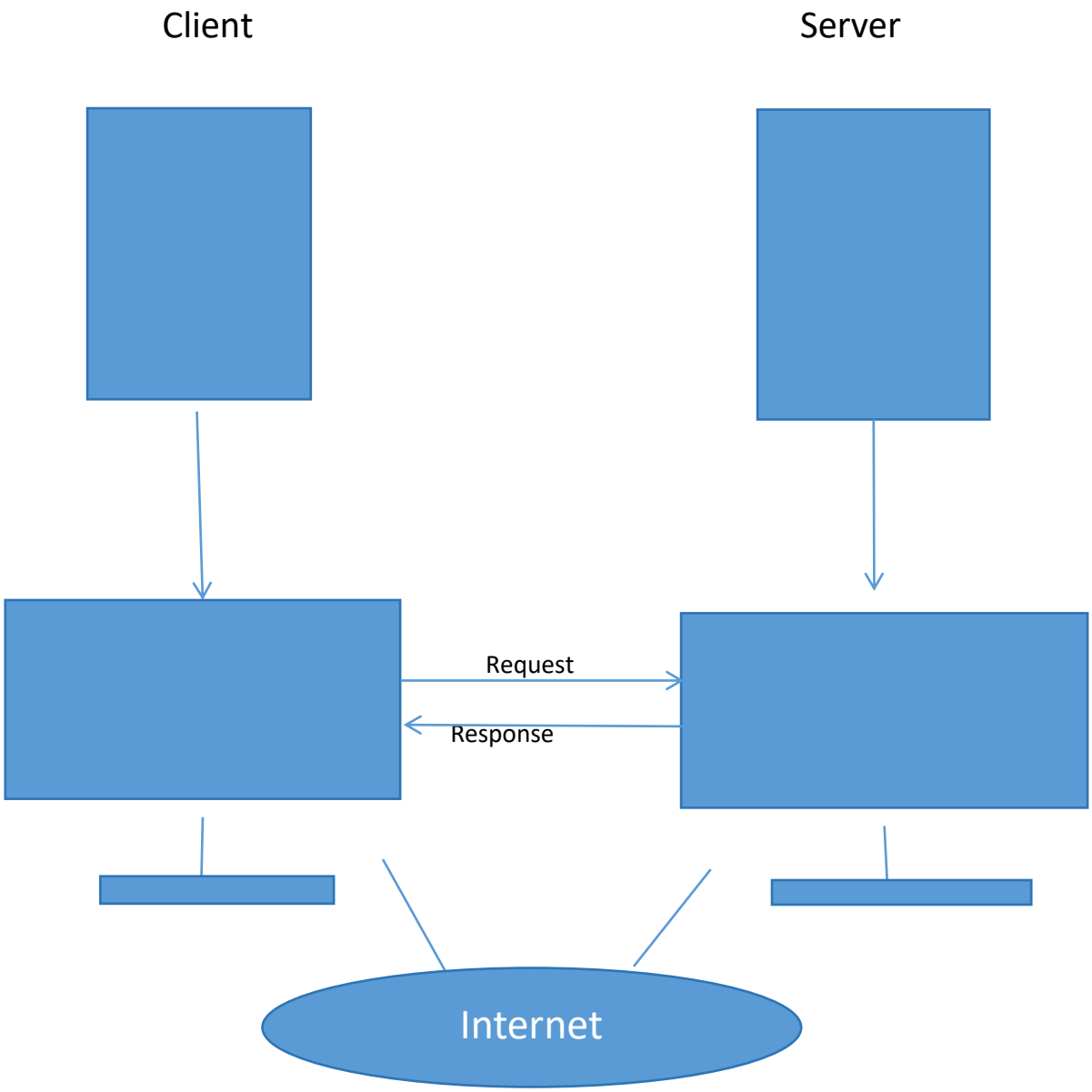
**(3) Research and create a diagram of how data is transmitted from a client to a server over the internet.**

Ans.



**(4) Design a simple HTTP client-server communication in any language.**

Ans.




Client:Request server for a a task. Generally called Desktop,PCs or work stations.

Server: Receive request from the clients. Process and Response them. Ex: Web server,Email server.

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

Ans.

1. Broadband:

- Broadband refers to high speed internet access that is faster than dial-up access.

  Pros:Reliable and faster than DSL

  Cons:speeds may slow during peak usage times.

2. Fiber optic:

- Uses fiber-optic cables to deliver data at the speed of light.

  Pros:Extremely high speed.

  Cons:Limited availability and Higher installation cost.

3. Satellite:

- This type of connection is provided mainly in rural areas where a broadband connection are unavailable.

  Pros:Suitable for basic browsing and email.

  Cons:Limited data plans.

(6) **Identify and explain three common application security vulnerabilities. Suggestpossible solutions.**

Ans.

1.Sql database queries

2.CSS

3.CSRF (Cross Site Request Forgery)

4.Server side request forgery

5.Broken authentication

6.Sensitive data exposure

**(7) Identify and classify 5 applications you use daily as either system software or application software.**

Ans. 1. Operating system

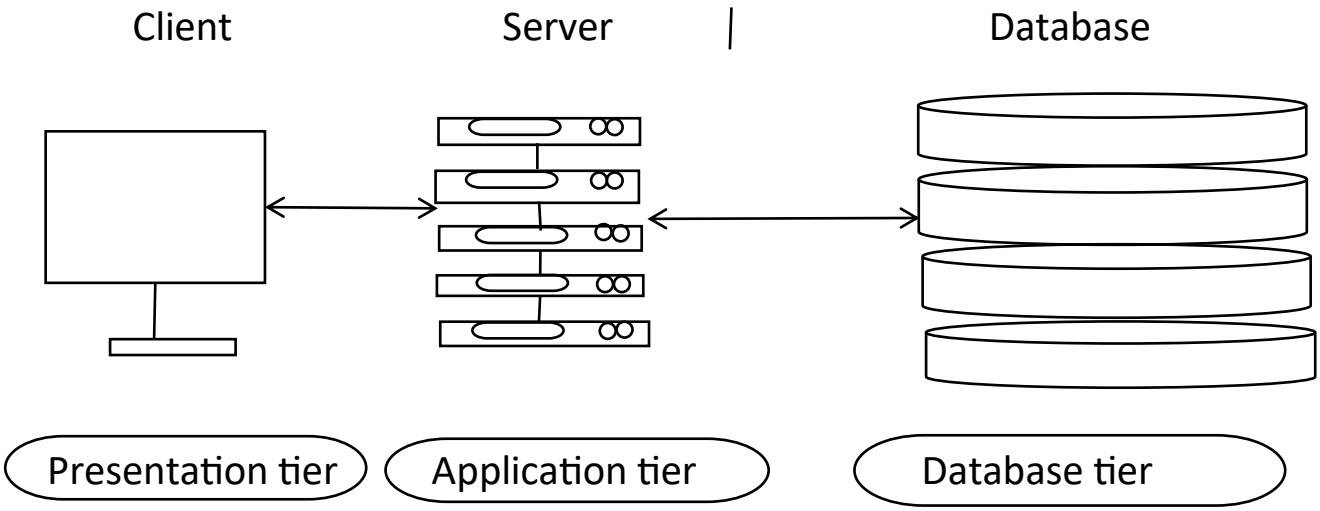
2. Web browser

3. Word processor

4. File manager
5. Messaging

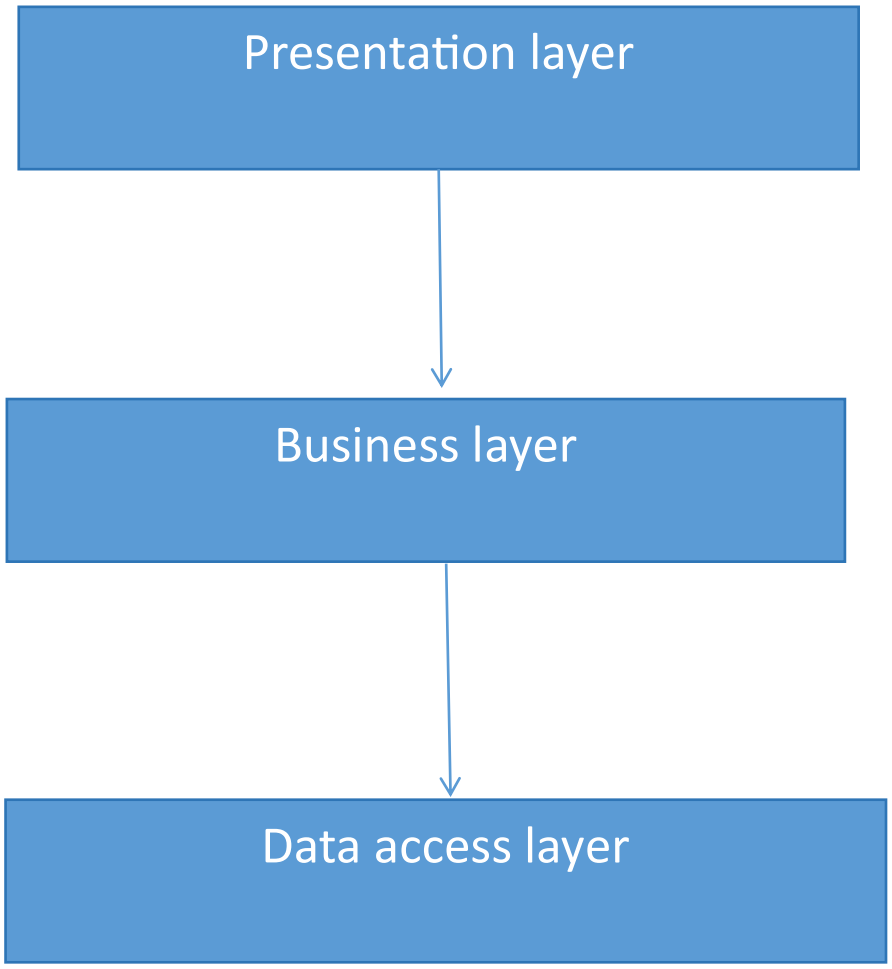
- System software provides functionality and manages hardware.
- Application software built for particular tasks needs for users.

**(8) Design a basic three-tier software architecture diagram for a web application.**



**(9) Create a case study on the functionality of the presentation, business logic, and dataaccess layers of a given software system.**

Ans.




1.Presentation layer:

- It acts as an interface between the user and the application.
- The layer at which users interact with the application and the final data will be visible to the users at the interface.

2. Business layer:

- It acts as an intermediate between the Presentation and the Data Access Layer.

3. Data Access Layer:

- The layer at which the data is managed.

**(10) Explore different types of software environments (development, testing, production).Set up a basic environment in a virtual machine.**

Ans.

1. Development environment
2. Testing environment
3. Performance Testing Environment
4. Staging environment
5. Production environment
6. Integration environment

To set up a basic environment in a virtual machine, follow these steps:

1.Prepare your computer for virtualization

2.Install a virtualization tool

3.Import a virtual machine

4.Start the virtual machine

5.Use the virtual machine

6.Shut down the virtual machine

**(11) Write and upload your first source code file to GitHub.**

Ans.

- Create your account in GitHub.
- Create new repositories.
- Make folder in your repositories and save your program.
- Then Drag and Drop files and upload your files in GitHub repositories.

**(12) Create a student account on GitHub and collaborate on a small project with a classmate.**

Ans.

- Create student account on GitHub:

First go to GitHub website then Click on the signup button in the top right corner then select Student as your account type.

Then Enter email address This will be your GitHub Username.

Then Create a strong and unique password for your github account.

**(13) Create a list of software you use regularly and classify them into the following categories: system, application, and utility software.**

Ans:

1. System Software:

- Operating System – Windows 10/11, macOS, Linux distributions.
- Antivirus & Security Software – Microsoft Security Essentials, Bitdefender, Norton.
- Command-Line Tools – Git, PowerShell

2. Application Software:

- Productivity & Office Tools– Microsoft Office (Word, Excel, PowerPoint), Google Workspace (Docs, Sheets, Slides).
- Web Browsers – Chrome, Firefox
- Email Clients – Gmail
- Photo Editing & Design – Adobe Photoshop, Illustrator.
- Development Tools– Visual Studio Code, PyCharm
- Communication & Collaboration – Zoom

3. Utility Software:

- File Management & Archiving– Zip, WinRAR, FileZilla.
- Disk Cleanup & Optimization – CCleaner, Disk Cleanup tools.
- Screen Capture & Recording – OBS Studio.
- System Monitoring & Performance Tools – Task Manager
- Backup & Restore Tools – Google Drive Backup, Time Machine.
- Password Managers

**(14) Follow a GIT tutorial to practice cloning,branching and merging repositories.**

Ans.

Create a Github repositories

- Create an account on GitHub.Already have an account then direct login your account.
- Click '+' button into the top right corner of the dashboard and select new repositories.
- Enter a unique and descriptive name for your repositories.
- Choose your repositories public(visible to everyone) or private(only visible to you).
- And then create repositories

**(15) Write a report on the various types of application software and how they improve productivity**

Ans.

1.Presentation software:

- Ex:Microsoft powerpoint,Google slides
- Making it easier to communicate ideas and information.

2.Database software:

- Ex:Oracle,MySQL
- These app.help users to store,manage and retrieve data and making it easier to store large datasets.

3.Graphic software:

- Ex:Illustrator,Adobe Photoshop
- These app. Enable users to create visual content, such as images,logos and brochures

4. Word processors:

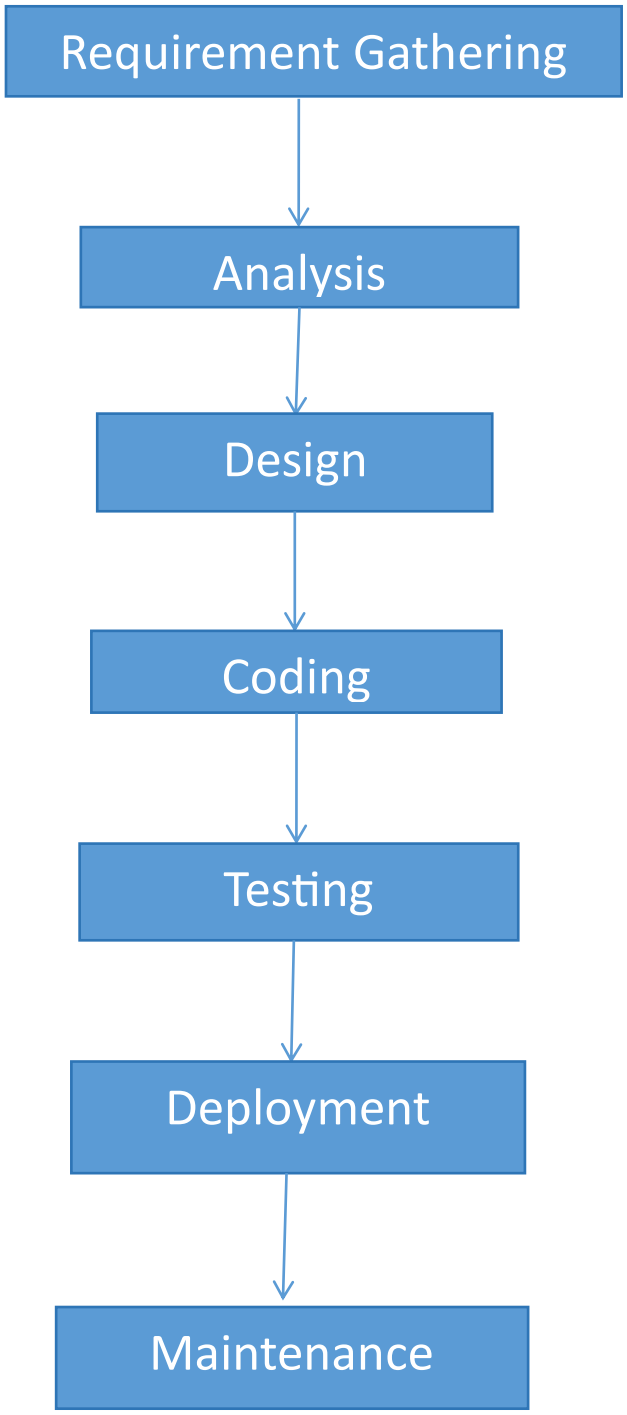
- Ex:Ms word,Google docs
- This app. Enable users to create,edit and print documents,making easier to manage written content.

5.Spreadsheet software:

- Ex:MS Excel,Google sheets
- These app. Help users to organize,analyze and visualize data
- And making it easier to ideas and information.

**(16) Create a flowchart representing the Software Development Life Cycle (SDLC).**

Ans.



**(17) Write a requirement specification for a simple library management system.**

Ans.

1.Book management:

- Add books,Update books,Delete books
- Search for books by title,author

2.Member management:

- Add,Update and Delete members to the system
- Search members by name or contact information

3.Borrowing and Returning books:

- Borrow books for the specific period
- Return borrowed books

4. Fine management:

- Calculate fines for overdue books.

5. Reporting and Analytics:

- Generate reports on book borrowing and returning trends

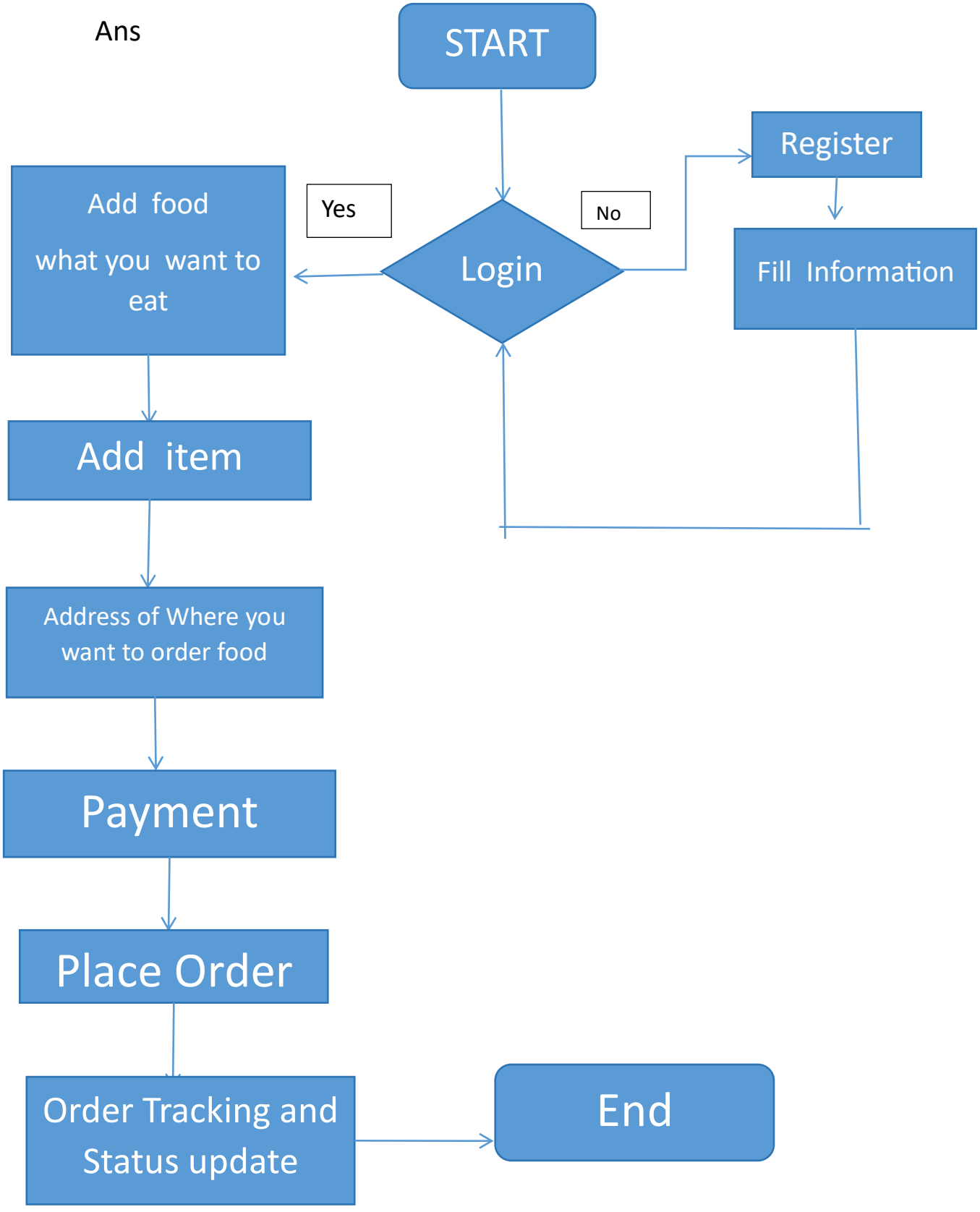
**(18) Perform a functional analysis for an online shopping system.**

Ans.

- User management:Register,Login and then Update profile
- Product management:Search and view details of the product
- Cart and Checkout process:Add,View,Update,Remove
- Order management:Order tracking,Order Cancellation
- Payment process:QR Code,Gpay,Credit card..
- Notifications and communications
- Administrative functions

**(19) Design a basic system architecture for a food delivery app.**

Ans



**(20) Develop test cases for a simple calculator program.**

Ans.

1 .Arithmetic operations:

- Addition
- Subtraction
- Multiplication
- Divison

2. Number entry:

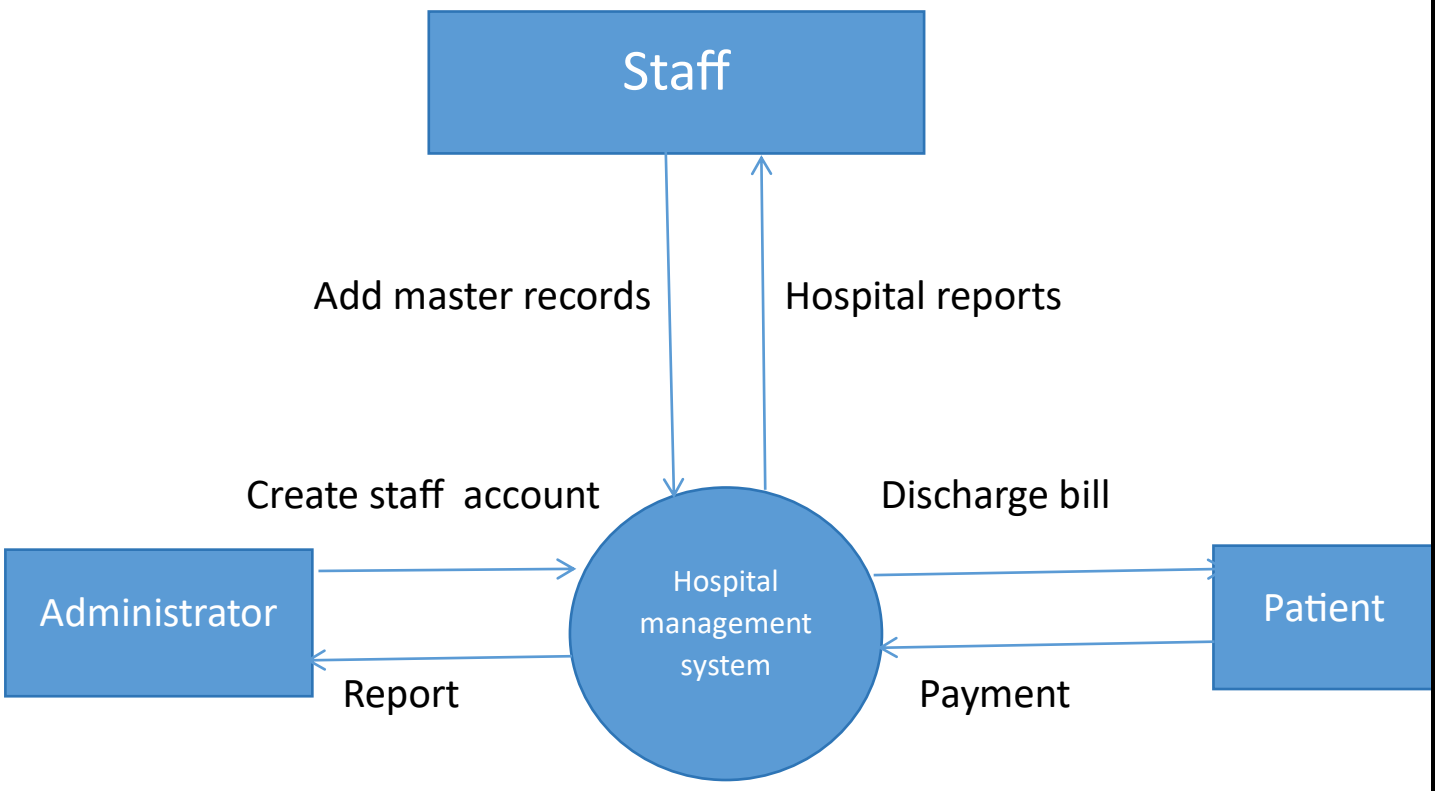
- Calculator should allow users to input numbers.
- Select any Operator. (for ex.+,-,*,%)
- Calculator should have an equal (=) button to calculate the result.
- Calculator should have a Clear button( C ) to clear the input.

**(21) Document a real-world case where a software application required critical maintenance.**

Ans.

- Software maintenance can include fixing bugs,adding new features,improving performance or updating the software to work with new hardware or software systems.
- It is most important to consider the cost and efforts required for software maintenance when planning and developing a software system.
- It is also important to have a clear and well defined maintenance plan that includes regular maintenance activities,such as bug fixing,testing,backup.

**(22) Create a DFD for a hospital management system.**



**(23) Draw a flowchart representing the logic of a basic online registration system.**