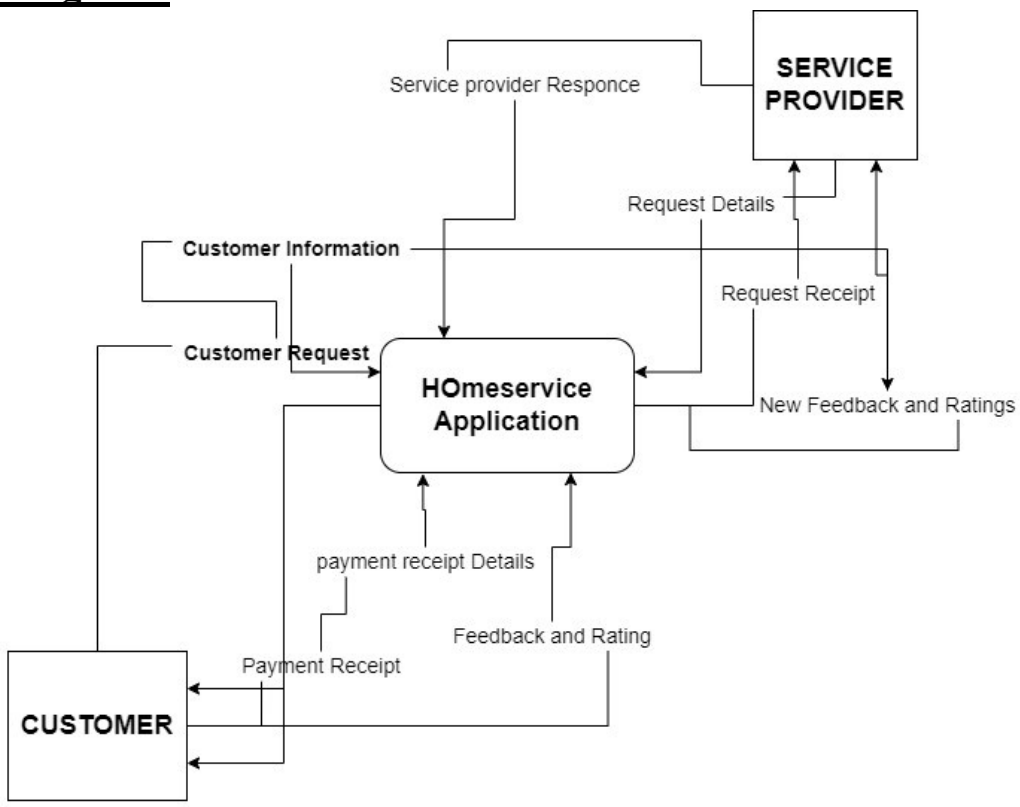
# Practical 6

**AIM: -** Prepare System Analysis and System Design of identified Requirement specification using structure design as DFD with data dictionary and Structure chart for the specific module.

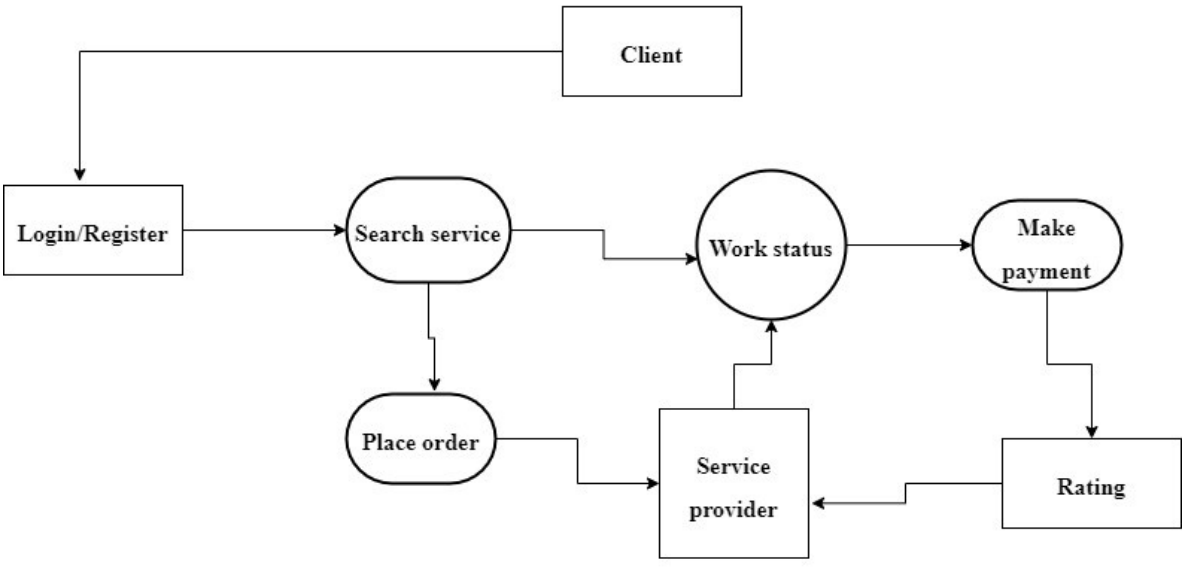
**THEORY:**

**DFD:** The objective of a DFD is to show the scope and boundaries of a system as a whole. It may be used as a communication tool between a system analyst and any person who plays a part in the order that acts as a starting point for redesigning a system. The DFD is also called as a data flow graph or bubble chart.

# DFD Diagram:




LEVEL 0




LEVEL 1

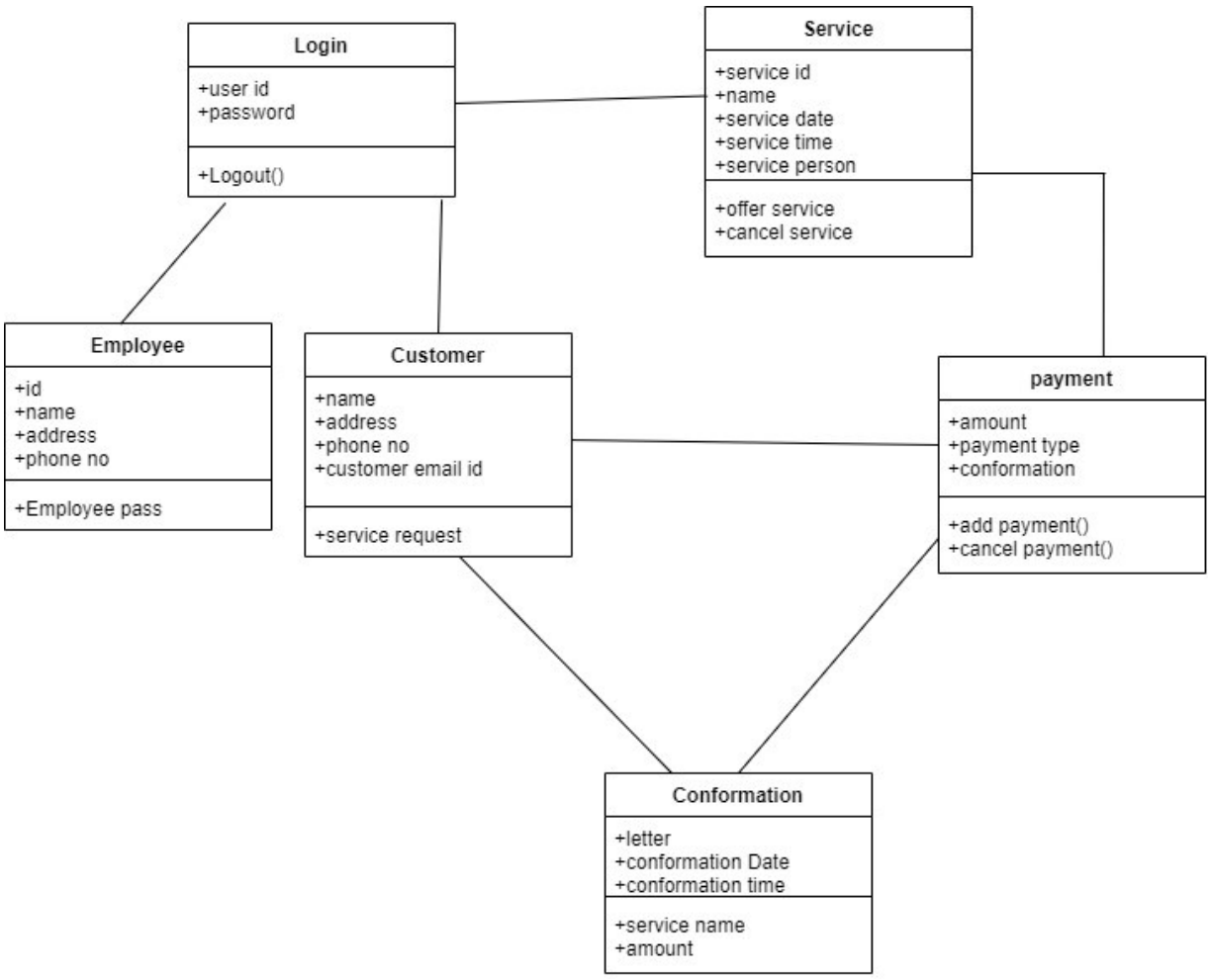
# Practical 7

**AIM:** Designing the module using Object Oriented approach including Use case Diagram with scenarios, Class Diagram and State Diagram, Collaboration Diagram, Sequence Diagram and Activity Diagram.

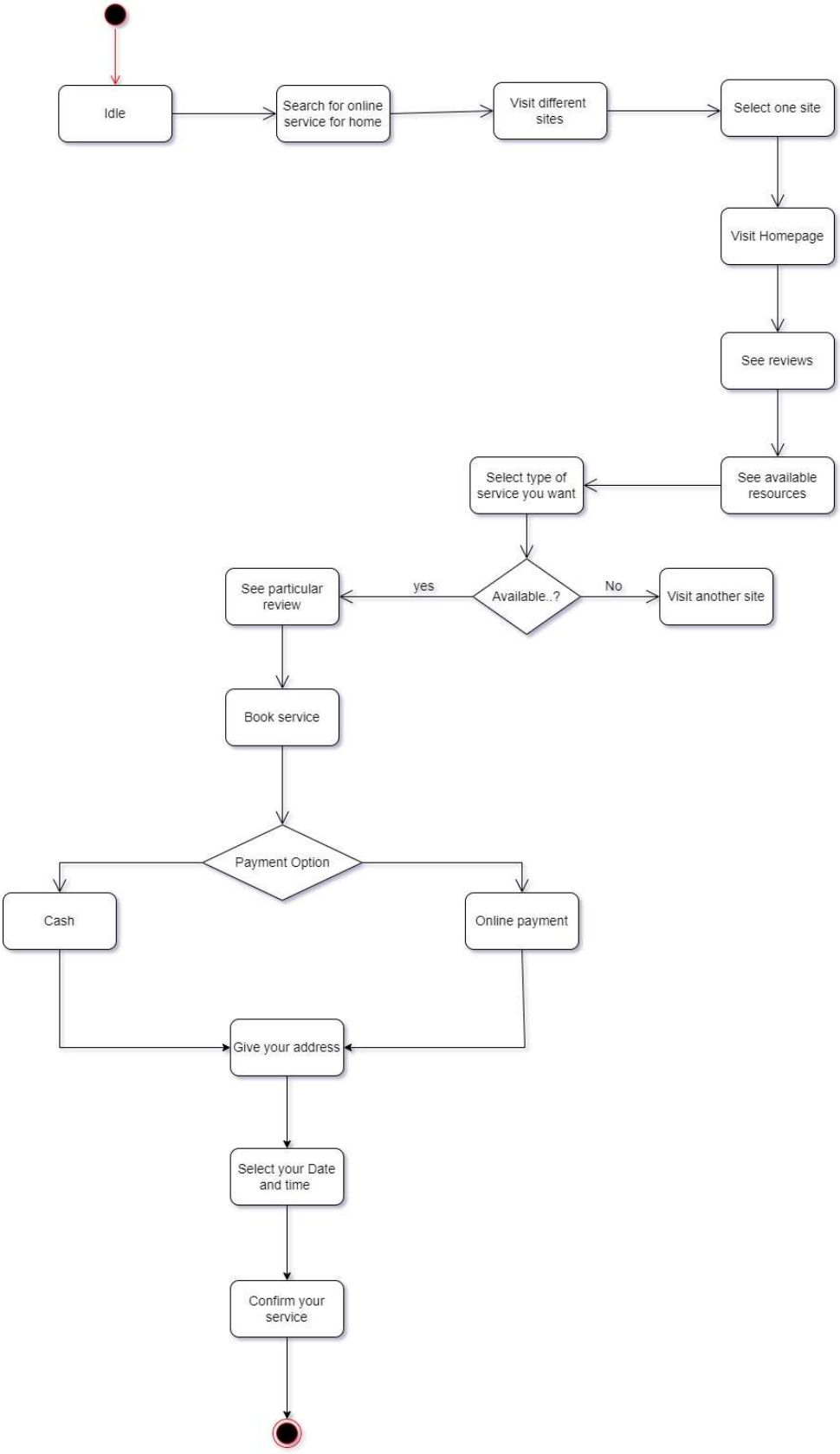
**THEORY:**

**1. Use Case Diagram**

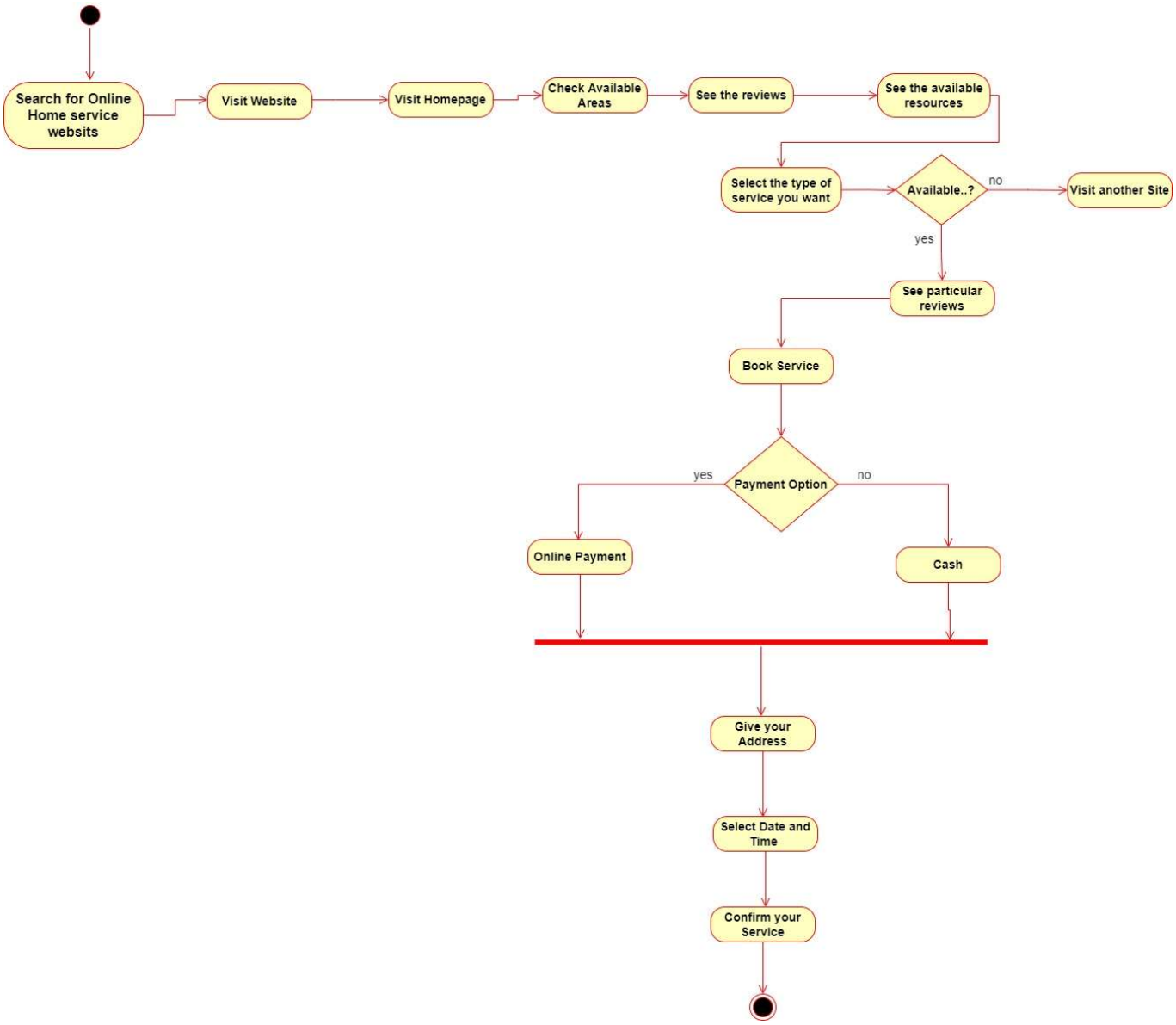
## 2. Class Diagram



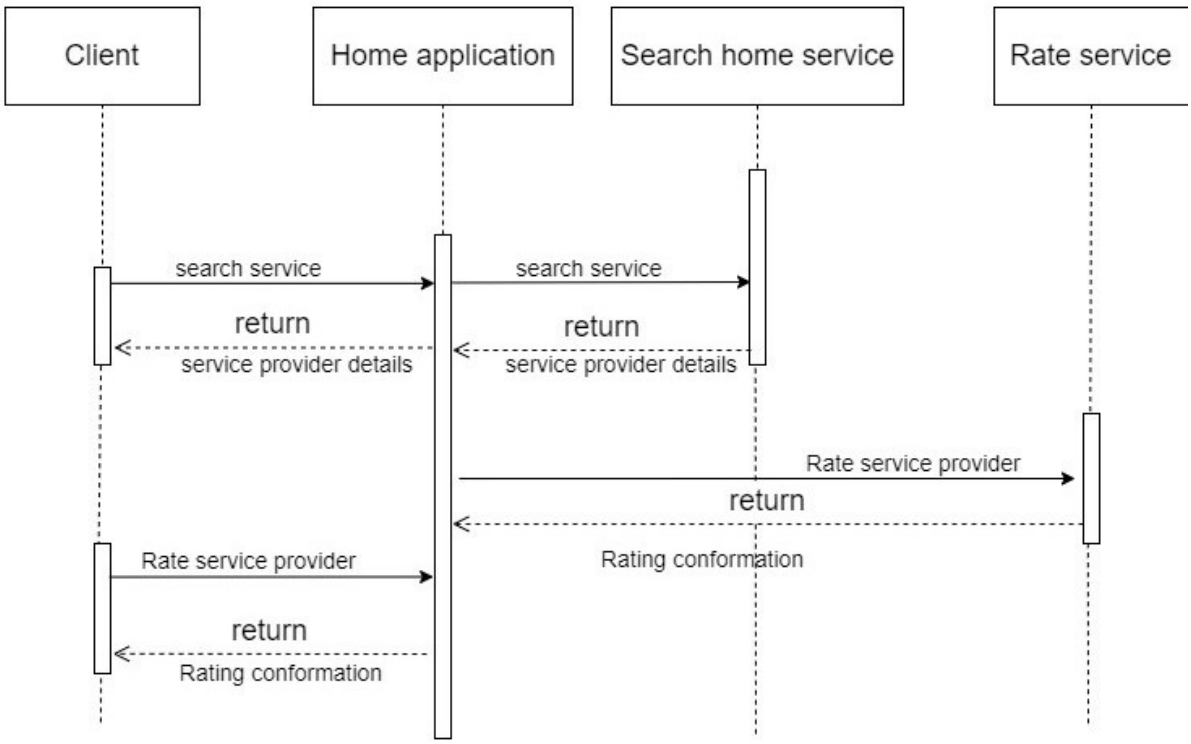
## 3. State Diagram



# 4.Activity Diagram



## 5.Sequencec Diagram



# Practical 8

**AIM:** Defining Coding Standards and walk through.

## THEORY:

### ➢ Coding Standards:

• Different modules specified in the design document are coded in the Coding phase according to the module specification. The main goal of the coding phase is to code from the design document prepared after the design phase through a high-level language and then to unit test this code.

• Good software development organizations want their programmers to maintain to some well- defined and standard style of coding called coding standards. They usually make their own coding standards and guidelines depending on what suits their organization best and based on the types of software they develop. It is very important for the programmers to maintain the coding standards otherwise the code will be rejected during code review.

### ➢ Purpose of having coding standards:

• A coding standard gives a uniform appearance to the codes written by different engineers.

• It improves readability, and maintainability of the code and it reduces complexity also.

• It helps in code reuse and helps to detect error easily.

• It promotes sound programming practices and increases efficiency of the programmers.

### ➢ Some of the coding standards:

**1. Limited use of global:**

These rules talk about which types of data that can be declared global and the data that can't be.

**2. Standard headers for different modules:**

For better understanding and maintenance of the code, the header of different modules should follow some standard format and information.

**The header format must contain below things that is being used in various companies:**

- Name of the module
- Date of module creation
- Author of the module
- Modification history
- Synopsis of the module about what the module does
- Different functions supported in the module along with their input output parameters
- Global variables accessed or modified by the module

**3. Naming conventions for local variables, global variables, constants and functions:**

Some of the naming conventions are given below:

- Meaningful and understandable variables name helps anyone to understand the reason of using it.
- Local variables should be named using camel case lettering starting with small letter (e.g., local Data) whereas Global variables names should start with a capital letter (e.g., Global Data). Constant names should be formed using capital letters only (e.g., CONSDATA).
- It is better to avoid the use of digits in variable names.
- The names of the function should be written in camel case starting with small letters.
- The name of the function must describe the reason of using the function clearly and briefly.

**4.Indentation:**

Proper indentation is very important to increase the readability of the code. For making the code readable, programmers should use White spaces properly.
Some of the spacing conventions are given below:

- There must be a space after giving a comma between two function arguments.
- Each nested block should be properly indented and spaced.
- Proper Indentation should be there at the beginning and at the end of each block in the program.

• All braces should start from a new line and the code following the end of braces also start from a new line.

**5. Error return values and exception handling conventions:**

All functions that encountering an error condition should either return a 0 or 1 for simplifying the debugging. On the other hand, Coding guidelines give some general suggestions regarding the coding style that to be followed for the betterment of understandability and readability of the code.

**6.Avoid using a coding style that is too difficult to understand:**

Code should be easily understandable. The complex code makes maintenance and debugging difficult and expensive.

**7.Avoid using an identifier for multiple purposes:**

Each variable should be given a descriptive and meaningful name indicating the reason behind using it. This is not possible if an identifier is used for multiple purposes and thus it can lead to confusion to the reader. Moreover, it leads to more difficulty during future enhancements.

**8.Code should be well documented:**

The code should be properly commented for understanding easily. Comments regarding the statements increase the understandability of the code.

**9.Length of functions should not be very large:**

Lengthy functions are very difficult to understand. That's why functions should be small enough to carry out small work and lengthy functions should be broken into small ones for completing small tasks.

**10.Try not to use GOTO statement:**

GOTO statement makes the program unstructured, thus it reduces the understandability of the program and also debugging becomes difficult.

➢ **Advantages of Coding Guidelines:**

• Coding guidelines increase the efficiency of the software and reduces the development time.

• Coding guidelines help in detecting errors in the early phases, so it helps to reduce the extra cost incurred by the software project.

• If coding guidelines are maintained properly, then the software code increases readability and understandability thus it reduces the complexity of the code.

• It reduces the hidden cost for developing the software.

# Practical 9

**AIM:** Write the testcases for the identified module.

**THEORY:**

# Practical 10

**AIM:** Define security and quality aspects of the identified module.

**THEORY:**

**QUALITY ASPECTS:**

ISO 9001: ISO 9001 sets out the criteria for a quality management system and is the only standard in the family that can be certified to (although this is not a requirement). It can be used by any organization, large or small, regardless of its field of activity. In fact, there are over one million companies and organizations in over 170 countries certified to ISO 9001. This standard is based on a number of quality management principles including a strong customer focus, the motivation and implication of top management, the process approach and continual improvement. Using ISO 9001:2015 helps ensure that customers get consistent, good quality products and services, which in turn brings many business benefits.

**BENEFITS OF ISO:9001**

An ISO 9001 Quality Management System (QMS) will help you streamline your processes, reduce errors, free up valuable management time and improve internal communications. Companies adopting this approach benefit from increased employee morale, improved customer retention and healthier revenues.

In short, through certification to ISO 9001 you demonstrate that your organization is customer focused and committed to delivering high quality services.

**Here are the top benefits of using the ISO 9001 framework:**

**1. Increased efficiency:** by following industry best-practice and focusing on quality you can reduce costs.

**2. Increased revenue:** through the reputation of ISO 9001 you can win more tenders and contracts, and by being more efficient you will also retain more customers and experience more repeat custom.

**3. Higher levels of customer satisfaction:** by understanding your customers' needs and reducing errors you increase customer confidence in your ability to deliver products and services.

**4. Improved supplier relationships:** because ISO 9001 certification ensures best-practice processes are in place which can contribute to more efficient supply chains, certification increases their confidence in your processes.

**5. Improved employee morale:** by improving internal communications you ensure everyone works to one agenda.

**REQUIREMENTS OF ISO:9001:**

a) needs to demonstrate its ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements, and
b) aims to enhance customer satisfaction through the effective application of the system, including processes for improvement of the system and the assurance of conformity to customer and applicable statutory and regulatory requirements.
All the requirements of ISO 9001:2015 are generic and are intended to be applicable to any organization, regardless of its type or size, or the products and services it provides.