

Programming in C

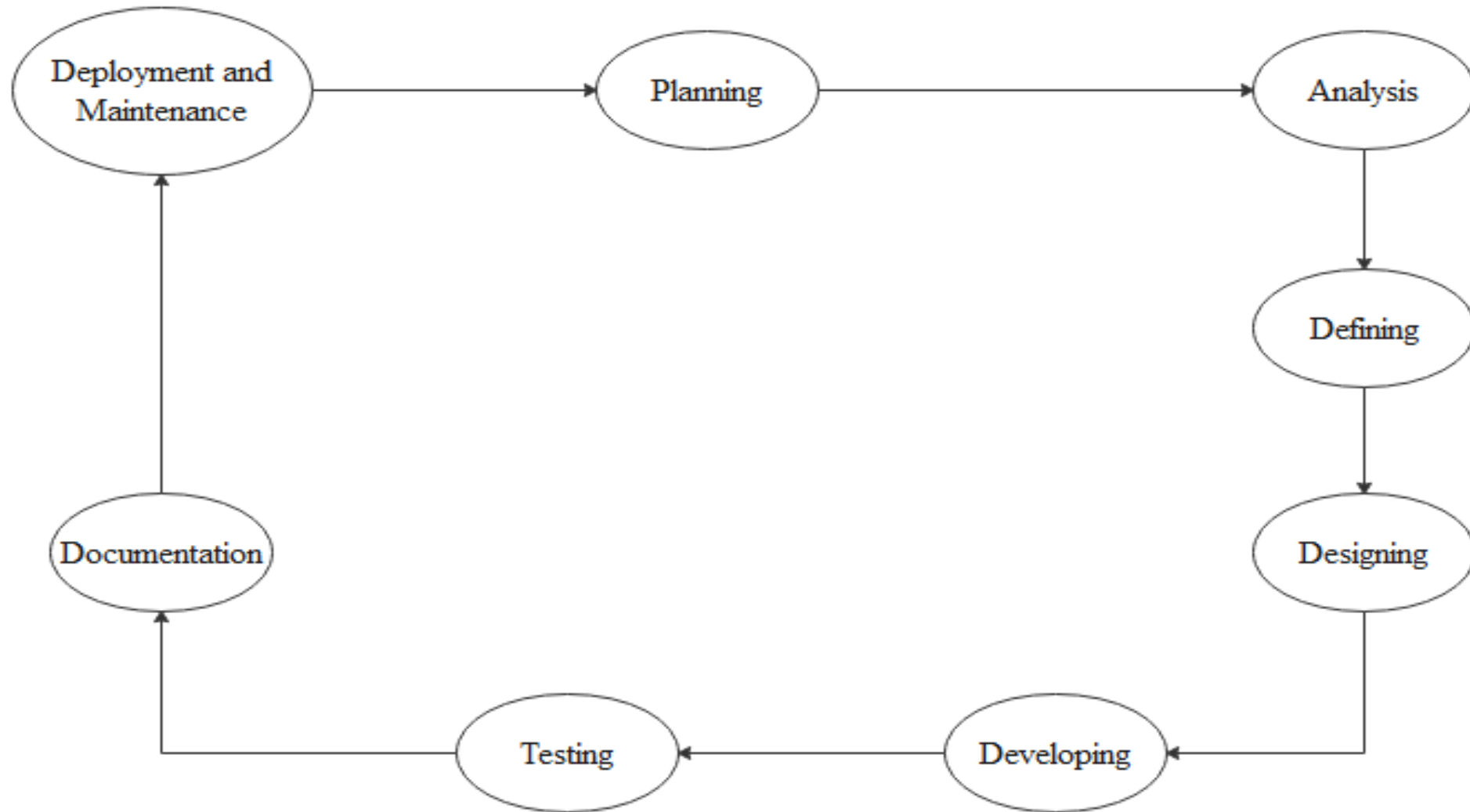
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Software Development Life Cycle:

- It is process used by the software engineers and software industries to design, develop and test high quality software that meets all the customer expectation and is completed within time and cost estimation.

Software Development Life Cycle:



Software Development Life Cycle:

1. Planning :

- Planning is first step of SDLC
- Defining requirement is the part of planning that is done to determine what the application is supposed to do and what are its requirements
- Requirements Gathering stage need teams to get detailed and precise requirements. This helps companies to finalize the necessary timeline to finish the work of that system.

Software Development Life Cycle:

2. Analysis:

- Can we create operations which is expected by the client?
- Can we complete the project within the budget or not?
- Decide that the project can be completed within the given schedule or not.
- Can we handle this project as cyber law

Software Development Life Cycle:

3. Defining:

- After the requirement analysis, the next step is to clearly define and document the product requirements
- This is done through an **SRS (Software Requirement Specification)** document which consists of all the product requirements to be designed and developed during the project life cycle

Software Development Life Cycle:

4. Designing:

- “ How will we get what we want?”
- Based on the requirement specified, different design approach for the product architecture is used to define the product along with its communication and data flow representation within the system

Algorithm:

- Algorithm is the sequence of steps/ instructions designed in such a way that if the steps are executed in particular sequence, desired output will be produced.

Guidelines to write algorithm:

1. Algorithm must be written using simple and easy language
2. It must not contain any programming language specific syntax
3. It must be common for every programming language
4. It must be finite i.e. it must terminate after finite numbers of steps.
5. Each steps written in algorithm must be clear and well defined
6. It must produce effective result as per the user's requirement

Algorithm to add two numbers:

1. Start
2. Declare variables to represent two numbers and result of sum, namely number1, number2 and sum.
3. Input number1 and number2
4. Add number1 and number2 and assign to sum
$$\text{sum} = \text{number1} + \text{number2}$$
5. Display sum
6. Stop

Write algorithm to

1. Calculate the result of student. Check if the student has failed or passed. Calculate percentage if and only if the student has scored above 45 in all five subjects
2. Check whether a given number is divisible by 5 and 3
3. Convert temperature in Celsius into temperature in Fahrenheit
4. Calculate roots of quadratic equation
5. Check whether a number is positive or negative

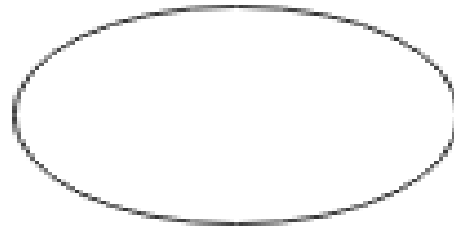
Flowchart:

- Flowchart is diagrammatic representation of an algorithm
- It is pictorial view of a program or system
- It is drawn by using basic blocks where each block have their standard meaning

Flowchart:

- Standard symbols used in flowchart are

1. Terminal Symbol (Oval):



Oval symbol is terminal symbol used to represent start and end of program

Standard symbols used in flowchart

2. Processing Symbol (Rectangle) :



Rectangle is used to represent action step or processing. Example:
Arithmetic operation

Standard symbols used in flowchart

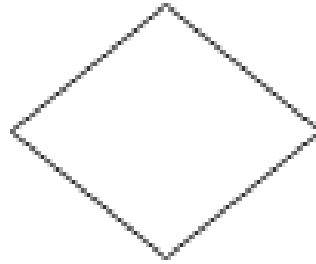
3. Input/ Output Symbol (Parallelogram):



Input/ output symbol is used to represent the Inputs to and Outputs from a process

Standard symbols used in flowchart

4. Decision making symbol (Diamond) :



This symbol is used when decision is to be made during processing.

Standard symbols used in flowchart

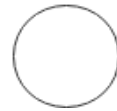
5. Flow lines (arrow):



Flow lines are used to connect symbols used in flowchart
And it indicates the direction of program sequence

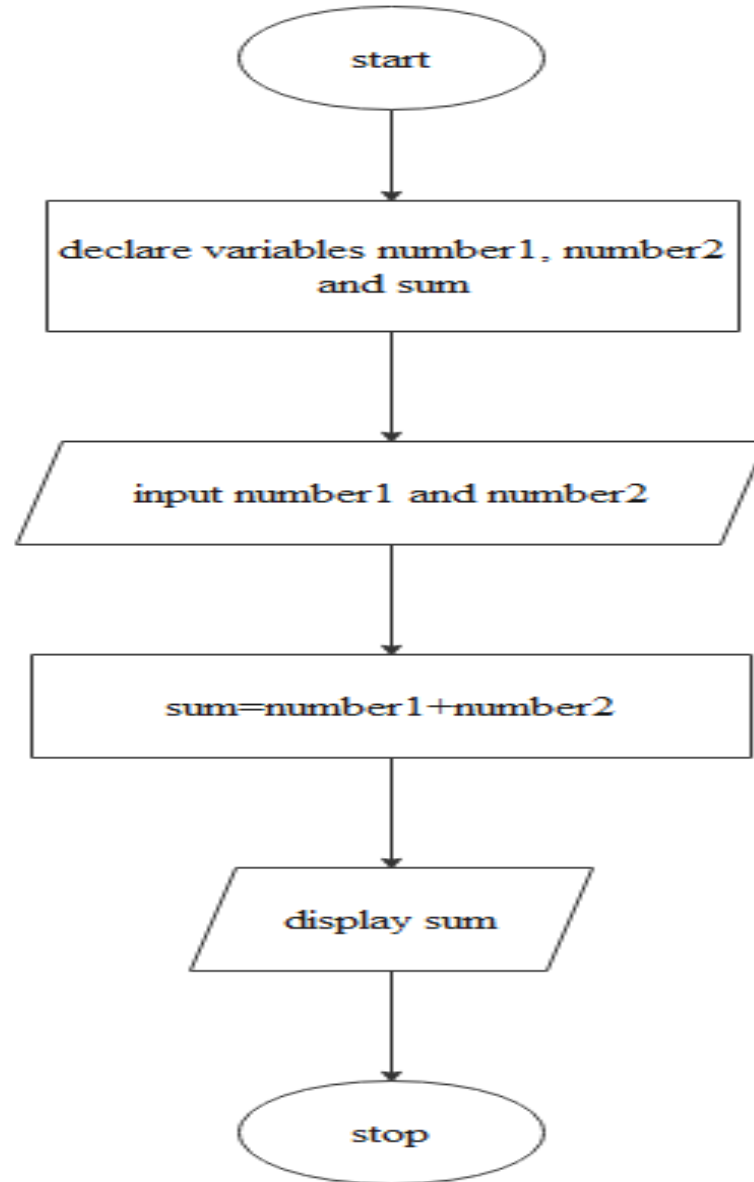
Standard symbols used in flowchart

6. Connector:



Connector is used to link and connect different segments

Flowchart to add two numbers:



Draw flowchart to

1. Calculate the result of student. Check if the student has failed or passed. Calculate percentage if and only if the student has scored above 45 in all five subjects
2. Check whether a given number is divisible by 5 and 3
3. Convert temperature in Celsius into temperature in Fahrenheit
4. Calculate roots of quadratic equation
5. Check whether a number is positive or negative

Software Development Lifecycle:

5. Developing :

- In this stage of SDLC the actual development starts and the product is built. The programming code is generated as per design document specification during this stage.
- If the design is performed in a detailed and organized manner, code generation can be accomplished easily
- Each programming language has its own syntax and rules.
- The programmer must follow the syntax and rules of the programming while coding

Software Development Lifecycle:

6. Testing and Debugging:

- Testing is process of finding errors and problems of a program
- Debugging is process of correcting the errors and problems found during testing phase

Software Development Lifecycle:

7. Program documentation:

- Documentation starts from beginning of SDLC.
- Documentation keeps records of each work and task performed in all above stages
- Documentation can be technical as well as user manual and user guide

Software Development Lifecycle:

8. Deployment and Maintenance:

- software deployment is the activity that makes software system available for the use to customer
- After the software is up and running, it requires continuous maintenance
- Addition of new features may be needed
- Upgrading the application to the newer versions of the Software