Chapter 1 Structures and Pointers

<u>Structure</u> is a user-defined data type to represent a collection of different types of data under a common name.

The dot operator (.) connects a structure variable and its element.

Array V/s Structure:

Arrays	Structures
• It is a derived data type.	• It is a user-defined data type
• A collection of same type of data.	• A collection of different types of data.
• Elements of an array are referenced	• Elements of structure are referenced
using the corresponding subscripts.	using dot operator (•)

Nested structure is a structure in which one of the elements is another structure

Pointer is a variable that can hold the address of a memory location.

Syntax to declare pointer variable: data type * variable;

The *address of operator* (&), is used to get the address of a variable.

The value at operator (*) is used to retrieve the value pointed to by the pointer

Two types of memory allocation:

The memory allocation before the execution of the program is *static memory allocation*. Memory allocation during run-time is *dynamic memory allocation*. The **new** operator is used for dynamic memory allocation and **delete** to de-allocate (free) the memory.

Memory leak: If the memory allocated using new operator is not freed using delete, that memory is said to be an orphaned memory block. On each execution of the program the size of the orphaned block is increased. Thus a part of the memory seems to disappear. This situation is known as *memory leak*.

Remedy: Ensure that the memory allocated using new is de-allocated using delete.

<u>Dynamic array</u> is a collection of memory locations created during run time using new operator. The syntax is: pointer = new data_type[size];

<u>Self referential structure</u> is a structure in which one of the elements is a pointer to the same structure.

~^^^^

Chapter 2 Concepts of Object Oriented Programming

Procedural paradigm V/s OOP

	Procedural paradigm		Object Oriented Paradigm
٠	Data is undervalued.	•	Data is given importance.
•	Procedure is given importance.	٠	Procedure is driven by data.

Class V/s Structure

	Class	Structure
1.	Contains data and functions as members.	1. Contains only data as members.
2.	Access specifiers are used for members.	2. No access specifiers are used.



vgirls.com

Basic Concepts of OOP

- 1. <u>Data abstraction</u>: Showing only the essential features and hiding the details.
- 2. Data encapsulation: Binds the data and functions together.
- 3. <u>Polymorphism</u>: The ability to process objects differently.
- 4. <u>Inheritance</u>: Creating new classes by deriving properties from existing class.
- 5. <u>Modularity</u>: Partitioning a program into small segments.

Types of Polymorphism: Compile time polymorphism & Run time polymorphism. Function overloading and operator overloading are examples for compile time polymorphism.

Types of Inheritance: Single level, Multi level, Multiple, Hierarchical

~^^^^

Chapter 3 Data Structures and Operations

Data structure is a way of organising logically related data items which can be processed as a single unit.

Classification of data structures:



Operations on Data Structures: Traversing, searching, inserting, deleting, sorting and merging.

Stack: Data structure that follows LIFO (Last In First Out) principle.

Push Operation: Inserting a new data item into the stack at Top position. Attempt to insert an item in a filled stack is **stack overflow**.

Pop Operation: Deleting an element from the top of a stack. Attempt to delete an item from an empty stack is **stack underflow**.

Queue: Data structure that follows the FIFO (First In First Out) principle. A queue has two end points - **Front** and **Rear**.

Linked list: It is a collection of nodes, where each node consists of two parts – a *data* and a *link*. Linked list is a dynamic data structure. It is created with the help of self referential structures.

^^^^

Chapter 4

Web Technology

Web server: A powerful computer that hosts websites. It is always switched on and connected to a high bandwidth Internet connection. Example for server operating systems – Linux (Ubuntu). Example for web server package – Apache Server.



Static web page V/s Dynamic web page

Static web page	Dynamic web page
The content and layout of a web page is fixed.	The content and layout may change during run time.
Static web pages never use databases.	Database is used to generate dynamic content through queries.

Client side scripting V/s Server side scripting

Client side scripting	Server side scripting
Script is copied to the client browser	Script remains in the web server
Script is executed in the client browser	Script is executed in the web server and the web page produced is returned to the client browser

Client side scripting languages: JavaScript, VB Script

Server side scripting languages: PHP, JSP, ASP, Pearl

Cascading Style Sheets (CSS): It is a style sheet language used for describing the formatting of a document written in HTML.

HTML Tags

Tags	Use	Attributes	Values and Purpose
<html></html>	To start an HTML document		
<head></head>	To specify the head section of an HTML document.		
<title></title>	This tag pair contains the text to be displayed in the title bar of browser.		
Section of the v Section of the v page.		Bgcolor	Colour for the background of a web page.
		Background	Image as the background of a web page.
	Defines the body	Text	Colour of the text in the web page.
	section of the web	Link	To specify the colour for the link unvisited.
	page.	Alink	To specify the colour for the link on click.
		Vlink	To specify the colour for the link visited.

Tags	Use	Attributes	Values and Purpose
<h1></h1>	To provide different	A 11	
<h6></h6>	levels of headings.	Align	"left", "right" and "center" are the values.
 	To break the current line of text and continues in the next line. No attributes.		
<p></p>	To create a paragraph leaving a blank line.		
	To draw a horizontal	Size	To specify the thickness
	line across the width	Width	To reduce the width of the line
<hk></hk>	of the browser	Color	To specify the colour for the line
	window	Noshade	To avoid shading to the line
<center></center>	To bring the content to the centre of the browser window. No attribute.		



Text formatting tags

Tags	Use
 and 	To make the text bold face.
<i> and </i>	To make the text <i>italics</i> or <i>emphasis</i> .
<u></u>	To <u>underline</u> the text
<s> and <strike></strike></s>	To strike through the text
<big></big>	To make the text big sized
<small></small>	To make the text small sized
	To make the text subscripted
	To make the text ^{superscripted}
<q></q>	To enclose the text in "double quotes"
<blockquote></blockquote>	To indent the text



<PRE> tag: The text enclosed will be displayed in its original form.

<ADDRESS> tag: The content of this tag can include name, phone numbers, PIN numbers, e-mail addresses, etc. Most of the browsers display the texts in italics.

| Tags | Use | Attributes | Values and Purpose |
|---------------------|-------------------|-------------------|--|
| | | Height | To set the height of the scroll area. |
| | | Width | To set the width of the scroll area. |
| | | Disection | To specify the direction of scrolling. "left", |
| | To scroll a text | Direction | "right", "up", "down" are the values. |
| <marquee></marquee> | or image in | Behavior | To specify the style of scrolling. |
| | the browser | Scrolldelay | To slow down (delay) the scroll |
| | | Scrollamount | To speed up the text scrolling |
| | | Develop | To specify a colour for the background of the |
| | | Bgcolor | scroll area. |
| <div></div> | To define a secti | ion in the docume | ent with separate alignment and style |
| | To change the | Color | To set the text colour |
| | size, style and | Face | It specifies the font face like Arial, Calibri, etc. |
| <foni></foni> | colour of the | Size | It specifies the font size |
| | text enclosed | <u>Enc</u> | To specify the file name of the image |
| | | Sit | To specify the height and width to display the |
| | - · · | Height | |
| | To insert | Width | image. |
| | image in a | Border | To put a border for the image. A numerical |
| | web page | border | value specifies the thickness. |
| | | ΛI 1 | To specify the text to be displayed in the |
| | | | absence of the image. |

^^^^



Chapter 5 Web Designing using HTML

Different types of Lists in HTML

There are three kinds of lists in HTML - unordered lists, ordered lists and definition lists.

| Tags | Use | Attributes | Values and Purpose | |
|-----------------------------------|--|--|---|--|
| | To create bulleted list | Туре | To specify the type of bullet. "Disc" , "Circle"
and "Square" are the values for ●, ○ and ∎ | |
| To create numbered list | Туре | To specify the type of numeral. The values are
"1" , "I" , "i" , "a" and "A" . | | |
| | list | Start | To specify the starting number. The value | |
| | | | should be an integer. | |
| 4 15 | To specify an item in the unordered or ordered list. Used inside the pairs | | ordered list. Used inside the pairs | |
| | and | | | |
| <dl></dl> | To create a definition list | | | |
| <dt></dt> | Used inside <dl> </dl> to specify each data item (or term) in the list | | | |
| <dd></dd> | Used after each <dt></dt> to describe the term | | | |

Links in HTML

A hyperlink (or simply link) is a text or an image in a web page, on clicking which another document or another section of the same document will be opened. The <A> tag, called anchor tag is used to give hyperlinks. Href is the main attribute of <A> tag. The URL (address of the web page/site) is given as its value. There are two types of linking – internal linking and external linking.

The following is an example for e-mail linking: SCERT

Creating Table in Web page

| Tags | Use | Attributes | Values and Purpose | |
|---|--|--------------------------------|--|---|
| | | Border | Thickness of the border line around the table. | |
| | | Bordercolor | To set the colour to the border | |
| <table></table> | To create table | Cellspacing | To specify the space to be left between cells. | |
| | | Colling deling | To specify the space in between the cell | |
| | | Cellpadding | border and cell content. | |
| <tr></tr> | To specify a row in a table | | | |
| | | | | |
| <th></th> | | To specify the | | To span a cell over 2 or more columns in a |
| | heading cell. | Colspan | row. | |
| <td></td> <td>To specify the data in a cell.</td> <td>Rowspan</td> <td>To span a cell over 2 or more rows in a column.</td> | | To specify the data in a cell. | Rowspan | To span a cell over 2 or more rows in a column. |
| <caption></caption> | To add descriptive text to a table as its caption. | | | |

Dividing the Browser window

The browser window can be divided into two or more panes to show different pages. **<FRAMESET>** tag is used to partition the browser window into different sections.



| Tags | Use | Attributes | Values and Purpose |
|--|--|------------|---|
| | To partition the | Cols | To specify the number of vertical frames in the frameset. |
| <frameset></frameset> | browser window | Rows | To specify the number of horizontal frames. |
| frame | frame sections. | Border | To specify the thickness of border for the frames |
| <pre><frame/> To define the frame for including the web page</pre> | To define the frame for | Src | To specify the html file to be loaded in the frame. |
| | including the web
page | Name | To give a name to target the frame |
| <noframe></noframe> | RAME> Used to display some text co support frames. | | t in the window if the browser is unable to |

Forms in Web pages

Tags	Use	Attributes	Values and Purpose
<form></form>	To provide a container for Form controls.		
			To specify the control type. The values:
			Text creates textbox,
			Password creates textbox in which typed
	To make	Туре	characters are displayed as asterisks (*),
	different types		Radio creates radio buttons for selection,
	of controls such		Submit creates submit button to upload data,
<input/>	as Text Box,		Reset clears the entries in the Form.
	Radio Button,	Name	To give a name to an input control.
	Submit Button	Value	To give an initial value to a control.
	etc.	C	To specify the size of the text box and password
		Size	box.
		Maulanath	To specify the maximum length of characters in
		Waxlength	text box and password box.
	To provide	Name	To give a name to the control
	space to give	Rows	To specify the number of rows in the area.
<textarea></textarea>	text in more	0.1	—
	than one line.	COIS	To specify the number of characters in a row.
	T	Name	To identify the control
<select></select>	To create drop	Size	To specify whether it is a list box or combo box.
	down list box	Multiple	To allow selection of multiple items.
	To specify the		
<option></option>	items in the	Selected	To indicate the item for default selection.
	SELECT list		
<fieldset></fieldset>	To group related controls in the Form.		
<legend></legend>	To set a caption for FIELDSET group		



Chapter 6 Client side Scripting using JavaScript

Data Types in JavaScript: Number, String, Boolean

Variables: Used for storing values. Declared using the keyword var as: var x;

Operators

Arithmetic operators	+ - * / %
Increment, decrement	++
Assignment operators	= += -= *= /= %=
Relational operators	< <= > >= == !=
Logical operators	&& !
String concatenation	+

Control Statements

	if (test expression)	REGACY TO EXCEL
	Statement:	www.rrvairls.com
	if (test expression)	
	statement 1;	
	else	
	statement_2;	
·c · · ·	if (test_expression1)	
if statements	statement_1;	
	else if (test_expression2)	
	statement_2;	
	:	
	:	
	else	
	statement_n;	
	switch (variable/expression)	
	{	
	case value1: statement1; break;	
switch	case value2: statement2; break;	
statement	:	
	:	
	default: statement;	
	}	
fa a la sa	for (initialization; test; update)	
for loop	body;	
	initialization;	
	while (test_expression)	
	{	
while loop	body;	
	update;	
	}	



Built-in Functions

Function	Use	Syntax / Example
alert()	To display a text in a message window.	alert("Welcome");
isNaN()	Returns True if the given value is not a number. That is, the argument contains a non-numeric character. Returns False is the argument is numeric.	isNaN("welcome"); and isNaN("A123"); return True. isNaN("13"); and isNaN(13); return False
toUpperCase()	Returns the upper case form of the given string.	Output of "Java".toUpperCase(); will be JAVA.
toLowerCase()	Returns the lower case form of the given string.	Output of "JavaSCIPT".toLowerCase(); will be javascript.
charAt()	Returns the character at a particular position. charAt(0) gives the 1 st character of a string.	"JavaScript".charAt(4); gives S, the 5 th character.
length property	Returns the length (number of characters) of the string.	"JavaScript".length will give 10.

~^^^^

Chapter 7 Web Hosting

Stages of web hosting: (i) Selection of hosting type (ii) Purchase of hosting space (iii) Registration of domain name and (iv) Transfer of files to the server using FTP.

Types of web hosting

- (i) Shared hosting: Most suitable for small websites that have less traffic. Cheaper and easy to use. Services will be slow.
- (ii) **Dedicated hosting:** Dedicated servers provide guaranteed performance, round-the-clock power supply, and fast access. But they are very expensive.
- (iii) Virtual Private Server (VPS): VPS provides almost the same services at a lesser cost than that of dedicated hosting. Some popular server virtualization softwares are VMware, FreeVPS, etc.

Free Hosting: Provides web hosting services free of charge. The size of the files that can be uploaded may be limited.

Content Management System: CMS refers to a web based software system which is capable of creating, administering and publishing websites. <u>Advantages:</u> Provides standard security features, CMS is economical. Eg: WordPress, Drupal and Joomla!

Responsive web design: Responsive web design is the custom of building a website suitable to work on every device and every screen size, no matter how large or small, mobile phone or desktop or television.

^^^^

Chapter 8 Database Management System

Database is an organized collection of inter-related data stored together with minimum redundancy, which can be retrieved as desirable.



Database Management System (DBMS) is essentially a set of programs which facilitates storage, retrieval and management of database.

Advantages of DBMS:

- Data redundancy (duplication of data) is controlled.
- Data inconsistency is avoided.
- Data are efficiently accessed.
- Data integrity is maintained.
- Data security is ensured.
- Data sharing is allowed.

Components of DBMS: Hardware, Software, Database, Users, Procedures:

Data organisation:

- <u>Field:</u> The smallest unit of stored data.
- <u>Record:</u> A collection of related fields.
- File: A collection of all occurrences of same type of records.
- <u>Database</u>: A collection of files associated with an organisation.

Three levels of Data abstraction:

- a. <u>Physical level</u>: The lowest level of abstraction describes how data is actually stored.
- b. <u>Logical level</u>: The next-higher level of abstraction describes what data is stored in the database.
- c. <u>View level</u>: It is the highest level of database abstraction and is the closest to the users.

Two types of Data independence

- a. <u>Physical data independence</u>: It refers to the ability to modify the schema at the physical level without affecting the schema at the conceptual level.
- b. <u>Logical data independence</u>: It refers to the ability to modify a conceptual schema without causing any changes in the schema at view (external) level.

Types of Users of database

- <u>Database Administrator (DBA)</u>: The person responsible for the control of the centralized and shared database.
- <u>Application Programmers:</u> Computer professionals who interact with the DBMS through application programs.
- <u>Sophisticated Users:</u> They interact with the database through their own queries.
- <u>Naive Users</u>: People accessing data by invoking one of the application programs.

Relation: A relation is also called Table. Data are organized in the form of rows and columns **Tuple:** The rows (records) of a relation are known as tuples.

Attribute: The columns of a relation are called attributes.

Degree: The number of attributes in a relation determines the degree of a relation.

Cardinality: The number of rows (records) or tuples in a relation is called cardinality of the relation. **Domain:** It is a pool of values in a given column of a table.

Schema: The description or structure of a database is called the database schema.

Instance: An instance of a relation is a set of tuples in it.





Types of Keys:

- <u>Candidate key:</u> It is the minimal set of attributes that uniquely identifies a row in a relation.
- <u>Primary key:</u> It is one of the candidate keys chosen to uniquely identify tuples within the relation.
- <u>Alternate key:</u> It is a candidate key that is not chosen as the primary key.
- Foreign key: A key in a table can be called foreign key if it is a primary key in another table.

Relational algebra

The fundamental operations in relational algebra are SELECT(σ), PROJECT (π), UNION, INTERSECTION, SET DIFFERENCE, CARTESIAN PRODUCT, etc.

~^^^^

Chapter 9

Structured Query Language

Components of SQL: Data Definition Language (DDL), Data Manipulation language (DML) and Data Control Language (DCL).

DDL commands: CREATE TABLE, ALTER TABLE, DROP TABLE, CREATE VIEW, DROP VIEW.

DML commands: INSERT INTO, SELECT, UPDATE, DELETE FROM.

DCL commands: GRANT, REVOKE.

SQL Data Types: INT or INTEGER, DEC or DECIMAL, CHAR or CHARACTER, VARCHAR, DATE, TIME.

Operator/	Purpose		Example
Function			
LIKE	To identify pattern matching.	SELECT *	FROM Student
		WHERE N	ame LIKE "%Kumar";
BETWEEN	To identify value that falls in a	SELECT *	FROM Employee
AND	given range.	WHERE Sa	alary BETWEEN 10000 AND 20000;
IN	To identify value from a given list.	SELECT *	FROM Bank
		WHERE B	ranch IN ("Trivandrum",
			"Ernakulam", "Kozhikode");
IS	To identify null values in a column.	SELECT *	FROM Stock
		WHERE Ta	ax IS NULL;
AND	To select rows when two or more SE		FROM Student
	conditions are TRUE.	WHERE B	atch = "Science" AND Marks > 50;
OR	To select rows when any one of the SELEC		FROM Players
	conditions is TRUE. WHERE @		ame = "Cricket" OR Game = "Hockey";
NOT	To select rows when the given	SELECT *	FROM Stock
	condition is FALSE.	WHERE Ta	ax IS NOT NULL;
Aggregate Functions			
COUNT()	To count the non-null values of a column.		SELECT COUNT(Fee) FROM Student;
	Also used to get number of rows		SELECT COUNT(*) FROM Student;
SUM()	To find the sum of values in a column.		SELECT SUM(Fee) FROM Student;
AVG()	To find the average of values in a column.		SELECT AVG(Salary) FROM Employee;
MAX()	To find the highest value in a column.		SELECT MAX(Marks) FROM Student;
MIN()	To find the lowest value in a column.		SELECT MIN(Marks) FROM Student;

View: It is a virtual table that does not really exist in the database, but is derived from one or more tables.

^^^^



Chapter 10 Server side Scripting using PHP

Output statements - echo() and print()

echo	print
Can take more than one parameter when used without parenthesis.	Takes only one parameter
Does not return any value.	Returns TRUE or 1 on successful output and FALSE if it was unable to print out the string.
Little faster than print.	Little bit slower than echo

vardump(): To display both data type and value of variables.

Variables in PHP

A variable in PHP starts with the \$ sign, followed by the name of the variable.

Data Types in PHP

- (i) Core data types Integer, Float/Double, String, Boolean
- (ii) Special data types Null, Array, Object, Resource

An example for String concatenation:

\$x = "PHP"; \$y = "Script"; \$z = \$x.\$y;

The . (dot) operator will add the two strings.



Arrays: (i) Indexed arrays, (ii) Associative arrays and (iii) Multi-dimensional arrays.

Indexed arrays: Arrays with numeric index are called indexed arrays. The function **array** () can be used to create an array.

Associative arrays: Arrays with named keys are called associative arrays.

```
$array_name = array(key=>value, key=>value, key=>value, etc.);
Eg: $marks = array("hari"=>54, "ravi"=>45, "mini"=>56);
echo $marks["hari"]; gives 54 as output.
```

foreach loop

It is used when we have an array with unknown number of elements. The foreach loop works only on arrays and has two formats.

```
foreach ($array as $value)
{
    //code to be executed;
}
```

Built-in Functions

Function	Use	Syntax / Example
date()	To display a date in given format	<pre>date("d-m-y") displays a</pre>
		date as 09-11-2017
chr()	Returns a character from the specified ASCII	chr(65) returns A
	value.	



strlen()	Returns the length of a string.	<pre>strlen("hello") returns 5</pre>
strpos()	Finds the position of the first occurrence of a	strpos ("hello", "e")
	string inside another string.	returns 1
strcmp()	Compares two strings	strcmp ("he", "HE")
		returns False

Form Methods – Get and Post

Method = GET	Method = POST
The data remains visible in the address bar since contents are passed as part of the URL	The data is not visible as contents are passed to the script as an input file.
Page link can be bookmarked.	Page link can never be book marked.
Data is submitted as part of the URL.	Data is submitted as part of an http request.
Data sending is fast but not secure.	Data sending secure but slow as compared to get.
GET can only send 2000 characters.	No limit.

Connecting PHP to Database (MySQL)

Connection to a MySQL database is done through the following steps:

1.	Open a connection to MySQL.	\rightarrow mysql_connect()
2.	Specify the database we want to open.	\rightarrow mysql_select_db()
3.	Retrieve data from or insert data into database.	→ mysql_query()
		<pre>mysql_fetch_array()</pre>
4.	Close the connection.	\rightarrow mysql_close()
~~~~	^^^^	^^^^

# Chapter 11 Advances in Computing

#### Serial Computing V/s Parallel Computing

Serial Computing	Parallel Computing
(a) Single processor is used.	(a) Multiple processors with shared memory.
(b) Instructions are executed sequentially.	(b) Instructions are executed concurrently.

#### **Grid Computing**

It is a world in which computational power (resources, services, data) are readily available which we can access as required. Grid computing is mainly used in disaster management, weather forecasting, market forecasting, bio-informatics etc.

#### **Cluster Computing**

It is a form of computing in which a group of personal computers, storage devices, etc. are linked together through a LAN so that they can work like single computer

#### **Cloud Computing**

It refers to the use of computing resources that reside on a remote machine and are delivered to the end user as a service over a network

Cloud services are grouped into three – Software as a Service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS).



#### **Applications of Computational Intelligence**

Biometrics: It refers to the measurements (metrics) related to human characteristics.

**Robotics**: It is the scientific study associated with the design, fabrication, theory and application of robots.

**Computer vision**: It is the construction of meaningful description of the structure and properties of the 3-dimensional world from 2-dimensional images.

**Natural Language Processing (NLP)**: It is branch of computer science that focuses on developing systems which allow computers to communicate with people using human languages such as English, Malayalam etc.

Automatic Speech Recognition (ASR): It refers to the AI methods of communicating with a computer in a spoken language like Malayalam.

**Optical Character Recognition (OCR) and Handwritten Character Recognition (HCR)**: The task of OCR and HCR are integral parts of pattern recognition.

**Bio-informatics**: It is the application of computer technology to the management of biological information.

**Geometric Information System (GIS)**: It is a computer system for capturing, storing, checking, and displaying data related to various positions on earth's surface.

^^^^

## Chapter 12

## **ICT and Society**



**Interactions in e-Governance:** Government to Government (G2G), Government to Citizens (G2C), Government to Business (G2B), Government to Employees (G2E)

**e-Governance infrastructure:** In India, the e-Governance infrastructure mainly consists of State Data Centers (SDC) for providing core infrastructure and storage, State Wide Area Network (SWAN) for connectivity and Common Service Centers (CSC) as service delivery points.

**e-Business** is the sharing of business information, maintaining business relationships and conducting business transactions by means of the ICT application.

**Electronic Payment System (EPS)** is a system of financial exchange between buyers and sellers in an online environment.

**e-Banking** or electronic banking is defined as the automated delivery of banking services directly to customers through electronic channel.

**e-Learning tools:** Electronic books reader (e-Books), e-Text, Online chat, e-Content, Educational TV channels.

**Intellectual property rights (IPR)** refers to the exclusive right given to a person over the creation of his/her mind for a period of time.

**Industrial property right** applies to industry, commerce and agricultural products. It protects patents to inventions, trademarks, industrial designs and geographical indications.

Patent is the exclusive rights granted for an invention.

**Trademark** is a distinctive sign that identifies certain goods or services produced or provided by an individual or a company.

**Industrial design** refers to the ornamental or aesthetic aspects of an article. A design may consist of three-dimensional features such as the shape, surface of an article or two-dimensional features, such as patterns, lines or colour.



**Geographical indications** are signs used on goods that have a specific geographical origin and possess qualities or a reputation that are due to that place of origin. Eg: Aranmula Kannadi and Palakkadan Matta Rice.

**Copyright** is a legal right given to the creators for an original work, usually for a limited period of time.

**Intellectual Property Infringement** is the unauthorised use of intellectual property rights such as patents, copyrights and trademarks.

Cyber space: It is a virtual environment created by computer systems connected to the Internet.

Cyber Crime: Cyber crimes include phishing, hacking, denial of service attacks, etc.

#### Cyber crimes against individuals:

- **Identity theft** occurs when someone uses another person's identifying information, like their name, credit card number, etc. without their permission to commit fraud or other crimes.
- **Harassment** means posting humiliating comments focusing on gender, race, religion, nationality at specific individuals in chat rooms, social media, e-mail, etc. is harassment.
- **Impersonation and cheating:** Impersonation is an act of pretending to be another person for the purpose of harming the victim.
- **Violation of privacy:** Violation of privacy is the intrusion into the personal life of another, without a valid reason.
- **Dissemination of obscene material:** The Internet has provided a medium for the facilitation of crimes like pornography. The distribution and posting of obscene material is one of the important cyber crimes today.

#### Cyber crimes against property:

- **Credit card fraud:** Credit card fraud involves an unauthorised usage of another person's credit card information for the purpose of payments for purchases or transferring funds from it.
- **Intellectual property theft:** The infringement of IPRs comes under this category. Violation of copyright, patent, trademark, etc. are intrusions against property.

#### Cyber crimes against government:

- **Cyber terrorism:** Cyber terrorism is a cyber attack against sensitive computer networks like nuclear power plants, air traffic controls, gas line controls, telecom, etc. Cyber terrorism focuses on the use of the Internet by anti nationals to affect a nation's economic and technological infrastructure.
- Website defacement: It includes hacking of government websites and posting derogatory comments about a government in those websites.
- Attacks against e-governance websites: These types of attacks deny a particular online government service. This is done using a Distributed Denial of Service (DDoS).

#### **Cyber Forensics**

It is the discipline that combines elements of law and computer science to collect and analyse data from computer systems, networks, communication systems and storage devices in a way that is admissible as evidence in a court of law.

#### Infomania

It is the state of getting exhausted with excess information. It is the excessive enthusiasm to for acquiring knowledge. This may result in neglecting the more important things like duties, studies, family etc.

^^^^^

