***ASSIGNMENT-7***

**WHAT IS A BLUETOOTH ?**

Bluetooth is a wireless technology standard used for exchanging data between fixed and mobile devices over short distances using UHF radio waves in the industrial, scientific, medical radio bands and building personal area networks.

It was originally conceived as a wireless alternative to RS-232 data cables.

Bluetooth was intended for portable equipment and its applications. The category of applications is outlined as the wireless [personal area network](https://en.wikipedia.org/wiki/Personal_area_network" \o "Personal area network) (WPAN). Bluetooth is a replacement for cabling in a variety of personally carried applications in any setting, and also works for fixed location applications such as smart energy functionality in the home (thermostats, etc.).

**HOW DOES IT OPERATE ?**

Bluetooth operates at frequencies between 2.402 and 2.480 GHz, or 2.400 and 2.4835 GHz including [guard bands](https://en.wikipedia.org/wiki/Guard_band" \o "Guard band) 2 MHz wide at the bottom end and 3.5 MHz wide at the top. This is in the globally unlicensed (but not unregulated) industrial, scientific and medical ([ISM](https://en.wikipedia.org/wiki/ISM_band" \o "ISM band)) 2.4 GHz short-range radio frequency band. Bluetooth uses a radio technology called [frequency-hopping spread spectrum](https://en.wikipedia.org/wiki/Frequency-hopping_spread_spectrum" \o "Frequency-hopping spread spectrum).

**WHAT DOES THE TERM “WI-FI” REFERS TO ?**

 Wi-fi is a family of [wireless network](https://en.wikipedia.org/wiki/Wireless_network" \o "Wireless network) [protocols](https://en.wikipedia.org/wiki/Communication_protocol" \o "Communication protocol), based on the [IEEE 802.11](https://en.wikipedia.org/wiki/IEEE_802.11" \o "IEEE 802.11) family of standards, which are commonly used for [local area networking](https://en.wikipedia.org/wiki/Wireless_LAN" \o "Wireless LAN) of devices and [Internet](https://en.wikipedia.org/wiki/Internet" \o "Internet) access.

As of 2017, the Wi-Fi Alliance consisted of more than 800 companies from around the world. As of 2018, over 2.97 billion Wi-Fi enabled devices shipped globally each year. Devices that can use Wi-Fi technologies include [personal computer](https://en.wikipedia.org/wiki/Personal_computer" \o "Personal computer) desktops and laptops, [smartphones](https://en.wikipedia.org/wiki/Smartphone" \o "Smartphone) and [tablets](https://en.wikipedia.org/wiki/Tablet_computer" \o "Tablet computer), [smart TVs](https://en.wikipedia.org/wiki/Smart_TV" \o "Smart TV), [printers](https://en.wikipedia.org/wiki/Printer_(computing)" \o "Printer (computing)), [smart speakers](https://en.wikipedia.org/wiki/Smart_speaker" \o "Smart speaker), cars, and [drones](https://en.wikipedia.org/wiki/Unmanned_aerial_vehicle" \o "Unmanned aerial vehicle).

**HOW DOES IT WORK ?**

Like mobile phones, a WiFi network makes use of radio waves to transmit information across a network. The computer should include a wireless adapter that will translate data sent into a radio signal. This same signal will be transmitted, via an antenna, to a decoder known as the router. Once decoded, the data will be sent to the Internet through a wired Ethernet connection.  
  
As the wireless network works as a two-way traffic, the data received from the internet will also pass through the router to be coded into a radio signal that will be received by the computer's wireless adapter.

## **WiFi Frequencies :**

A wireless network will transmit at a frequency level of 2.4 GHz or 5GHz to adapt to the amount of data that is being sent by the user. The 802.11 networking standards will somewhat vary depending mostly on the user's needs.

**BLUETOOTH VS WI-FI :**

Bluetooth and [Wi-Fi](https://en.wikipedia.org/wiki/Wi-Fi" \o "Wi-Fi) (Wi-Fi is the brand name for products using [IEEE 802.11](https://en.wikipedia.org/wiki/IEEE_802.11" \o "IEEE 802.11) standards) have some similar applications: setting up networks, printing, or transferring files.

Wi-Fi is intended as a replacement for high-speed cabling for general [local area network](https://en.wikipedia.org/wiki/Local_area_network" \o "Local area network) access in work areas or home. This category of applications is sometimes called [wireless local area networks](https://en.wikipedia.org/wiki/Wireless_local_area_network" \o "Wireless local area network) (WLAN).

1. Wi-Fi and Bluetooth are to some extent complementary in their applications and usage. Wi-Fi is usually access point-centered, with an asymmetrical client-server connection with all traffic routed through the access point, while Bluetooth is usually symmetrical, between two Bluetooth devices.
2. Bluetooth serves well in simple applications where two devices need to connect with a minimal configuration like a button press, as in headsets and remote controls, while Wi-Fi suits better in applications where some degree of client configuration is possible and high speeds are required, especially for network access through an access node.
3. However, Bluetooth access points do exist, and ad-hoc connections are possible with Wi-Fi though not as simply as with Bluetooth. [Wi-Fi Direct](https://en.wikipedia.org/wiki/Wi-Fi_Direct" \o "Wi-Fi Direct) was recently developed to add a more Bluetooth-like ad-hoc functionality to Wi-Fi.

## Wi-Fi Vs. Bluetooth :

|  |  |  |
| --- | --- | --- |
| **BASIS OF COMPARISON** | Wi-Fi | Bluetooth |
| **Technology** | Radio waves | Radio waves. |
| **Multiplexing** | OFDM | FHSS, OFDM, DSSS. |
| **Range** | 30 meters for indoor and 100 meters outdoor. | 10 meters range. |
| **Frame Size** | 0 to 2404 bytes. | 350 bytes. |
| **Speed** | Up to  60 Mbps. | 1 to 4 Mbps. |
| **Frequency Range** | 20 MHz | 2.4 GHz. |
| **Media Access** | CSMA/CD, CDMA | Distributed/central CSMA/CA, MACAW. |
| **Application Using The Technology** | Video game consoles, PDAs, mobile phones, consumer electronics. | Microwave ovens, DVD players, Cameras, banking, office, etc. |

***ASSIGNMENT-8***

**WHAT IS A VIRUS IN COMPUTING ?**

A computer virus is a type of computer program that, when executed, replicates itself by modifying other computer programs and inserting its own code. When this replication succeeds, the affected areas are then said to be "infected" with a computer virus.

**TYPES OF COMPUTING VIRUSES:**

9 Types Of Computer Viruses That You Should Know About – And How To Avoid Them

#### 1. Boot Sector Virus

#### Even though this virus has now become obsolete, it still pops out in one way or the other. This virus got attention when floppy disks were used to boot a computer. In modern computers, this virus could appear on the “Master Boot Record”. In the partitioned storage device of your computer, it is the first sector to take place.

#### However, thanks to the fact evolution of Internet, the threat of this virus is now mitigated.

#### 2. Web Scripting Virus

#### Similar to the hyperlinks that we used in Microsoft Word, many websites rest on codes to provide engaging content to their users. For example, since the trends of watching videos online have now become very popular – more than 2 Billion Videos are streamed on Facebook every day, these videos also execute a specific code.

#### These codes can be exploited and it is very troublesome to note that this exploitation has taken place on some very notable sites. All the hackers have to do it to leave a comment in the Comments Section of the website which contains that code. Thus, even without the Webmaster knowing it, the code gets exerted into the site.

#### 3. Browser Hijacker

#### Ever faced a problem where the homepage of your web page gets automatically directed to a particular site? Well, that is the most common way by which this ransomware hijacks your browser.

#### While its visual effects might epitomize the threat, this hijacker is nothing more than a tactic to increase income from web ads. However, if you still want to clean your computer from this virus, give [Soft2Secure](http://soft2secure.com/knowledgebase/teslacrypt-3-0) a go.

#### 4. Resident Virus

#### After inserting itself directing into the memory of your system, this virus has the capability to take a number of actions. One of its more troublesome features is its ability to run away. Leaving behind the file which was originally infected, this virus has the ability to run on its own.

#### 5. Direct Action Virus

#### Similar to the Vienna virus which shocked computers in 1998, this virus comes into action after you have executed the file. The load is delivered to your computer and the virus becomes active.

#### However, this virus has a limitation. It takes no action unless the file which is infected gets implemented again.

#### 6. Polymorphic Virus

#### One of the factors that epitomize the usefulness of this virus is its ability to evade. The Antivirus programs that are enabled on our computers detect the presence of any virus by detecting its code.

#### Polymorphic virus has exploited this limitation beautifully as it changes its code every time the infected file is executed. Thus, it becomes nearly impossible for any ordinary antivirus to track it down.

#### 7. File Infector Virus

#### Although the word “file” in its name might suggest otherwise, this virus does not take the help of files every time. In fact, the file is only the starting point as the file infector dwarfs the first file after which it re-writes the file.

#### 8. Multipartite Virus

#### If you have read carefully the aforementioned viruses, you might have noticed that they use two methods for their transmission. Either they use one method or a single payload is delivered.

#### However, this virus wants to claim both. Depending upon the operating system of your computer or the files that exist on your computer, it might use any of the two methods to spread.

#### 9. Macro Virus

#### Appearing in the form of a word document which seemingly links the user to pornographic websites, Melissa is one of the most known Micro Virus. Going one step further, this virus not only exploits the user but also his/her friends by mailing the copies of the infected virus document to the contact list.

#### If you are handling a website, you can also [keep your website virus and malware-free using Sitelock](https://hostingdecisions.com/what-is-sitelock/" \t "https://www.youngupstarts.com/2016/04/14/9-types-of-computer-viruses-that-you-should-know-about-and-how-to-avoid-them/_blank). You can also see how to stop cyber attacks with these [Cyber Security Kiosks](https://thelab.olea.com/stop-cyber-attacks-front-door-cyber-security-kiosks/) from Olea.