Department of Computer Science and Application

Report
Of
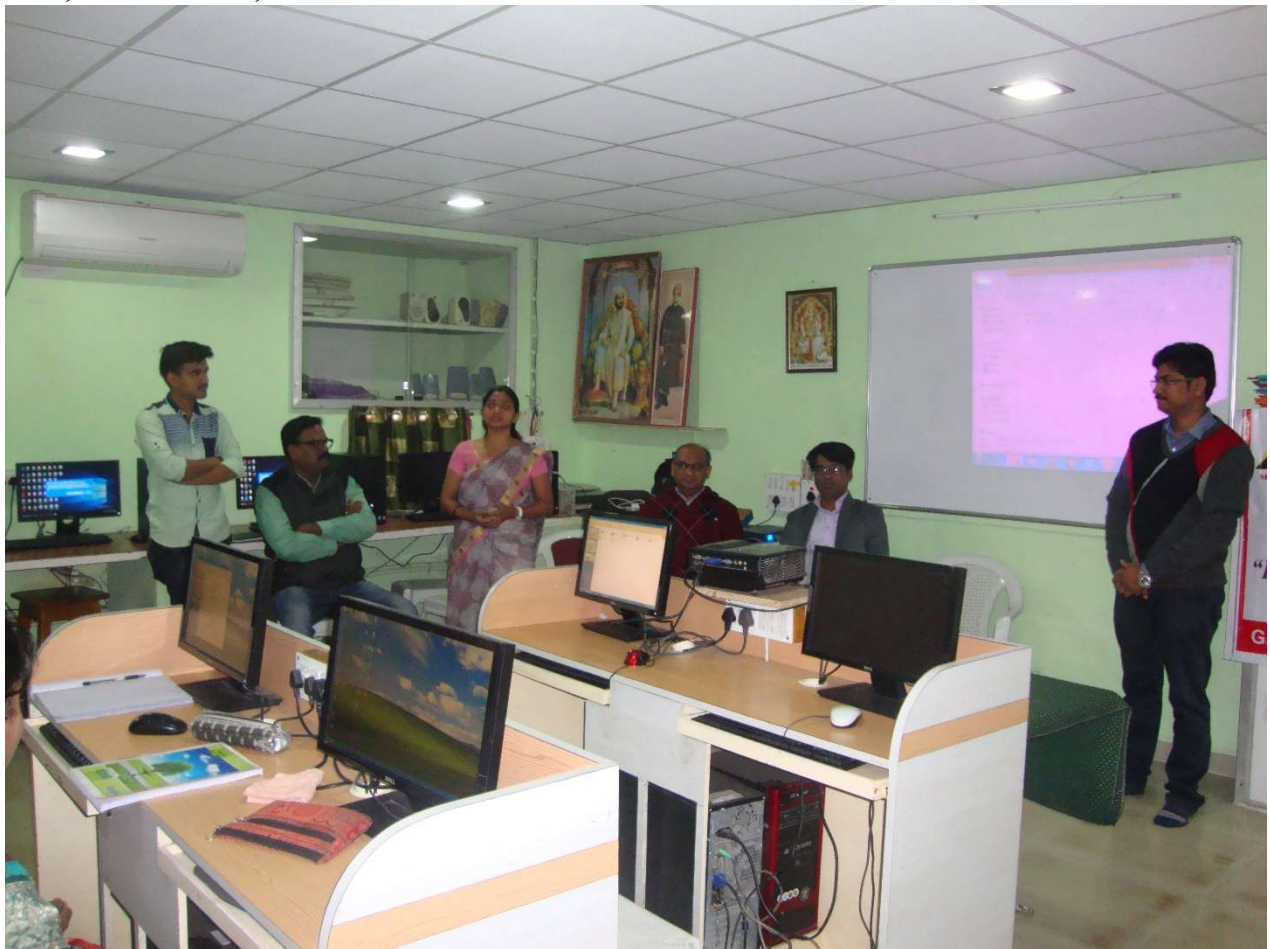### "Certificate Course of Internet of Things"
Date 2 to 6th January, 2020

The department organized certificate course of "Internet of things" for the advance skill development. This one week certificate course of Internet of Things is organized in collaboration with Microspectra Software Technologies limited. The details about the course is given below:

Course Title: "Certificate Course of Internet of Things"
Course Duration: 1 weeks

About this course:-
Internet of Things or IoT in short, is the idea of making devices and objects smarter by linking them to the internet. IoT has promising applications for smart homes, wearable devices, smart cities, connected cars and more.

Vidarbha Shikshan Prasarak Mandal's
G. S. Science, Arts and Commerce College, Khamgaon
Affiliated to Sant Gadge Baba Amravati University, Amravati
Listed u/s 2 (f) and 12 (B) Of the UGC Act
Reaccredited by NAAC with B grade (CGPA 2.82)

College Code: 301

File commands

ls	Directory listing
ls -al	Formatted listing with hidden files
cd dir	Change directory to dir
cd	Change to home
pwd	Show current directory
mkdir dir	Create a directory dir
rm file	Delete file
rm -r dir	Delete directory dir
rm -f file	Force remove fire
rm -rf dir	For remove directory dir
cp file1 file2	Copy file1 to file2
cp -r dir1 dir2	Copy dir1 to dir2; create dir2 if it doesn't exit
mv file1 file2	Rename or move file1 to file2. If filed 2 is an existing directory, moves file1 into directory file2
ln –s file link	Create symbolic link link to file
touch file	Create or update file
cat > file	Places standard input into file
more file	Output the contents of file
head file	Output the firest 10 lines of file
tail file	Output the last 10 lines of file
tail –f file	Output the contents of file as it grows, starting with the last 10 lines

Process Management

ps	display all currently active processes
top	display all running processes
kill pid	kill process id pid
killall proc	kill all processes named proc *
bg	lists stopped or background jobs; resume a stopped job in the background
fg	Brings the most recent job to the foreground
fg a	brings job a to the foreground

File Permissions

chmod octal file	change the permissions of file to octal, which can be found separately for user, group, and world by adding: • 4 – read (r) • 2 – write (w) • 1 – execute (x) **Examples:** **chmod 777** – read, write, execute for all **chmod 755** – rwx for owner, rx for group and world. For more options, see **man chmod**.

SSH

ssh user@host	connect to host as user
ssh -p port user@host	connect to host on port port as user
ssh-copy-id user@host	add your key to host for user to enable a keyed or passwordless login

Searching

grep pattern files	search for pattern in files
grep -r pattern dir	search recursively for pattern in dir
command	grep pattern	search for pattern in the output of command
locate file	find all instances of file

System Info

date	show the current date and time
cal	show this month's calendar
uptime	show current uptime
w	display who is online
whoami	who you are logged in as
finger user	display information about user
uname -a	show kernel information
cat /proc /cpuinfo	cpu information
cat /proc /meminfo	memory information
man command	show the manual for command
df	show disk usage
du	show directory space usage
free	show memory and swap usage
whereis app	show possible locations of app
which app	show which app will be run by default

Compression

tar cf file.tar files	create a tar named file.tar containing files
tar xf file.tar	extract the files from file.tar
tar czf file.tar.gz files	create a tar with Gzip compression
tar xzf file.tar.gz	extract a tar using Gzip
tar cjf file.tar.bz2	create a tar with Bzip2 compression
tar xjf file.tar.bz2	extract a tar using Bzip2
gzip file	compresses file and renames it to file.gz
gzip -d file.gz	decompresses file.gz back to file

Network

ping host	ping host and output results
whois domain	get whois information for domain
dig domain	get DNS information for domain
dig -x host	reverse lookup host
wget file	download file
wget -c file	continue a stopped download

Installation

Install from source: ./configure make make install dpkg -i pkg.deb rpm -Uvh pkg.rpm	 install a package (Debian) install a package (RPM)

Shortcuts

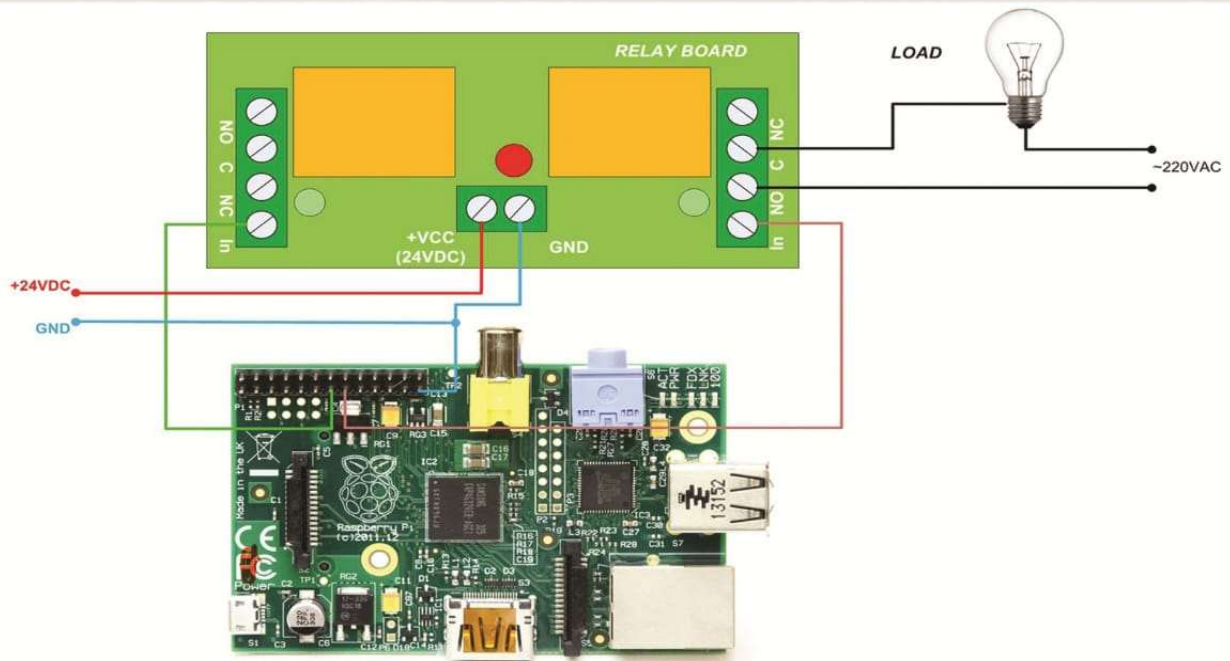|	
Ctrl+C	halts the current command
Ctrl+Z	stops the current command, resume with fg in the foreground or bg in the background
Ctrl+D	log out of current session, similar to exit
Ctrl+W	erases one word in the current line
Ctrl+U	erases the whole line
Ctrl+R	type to bring up a recent command
!!	repeats the last command
exit	log out of current session
*	use with extreme caution

Linux/Unix Commands

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Connection of Relay to Raspberry Pi

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Flame sensor

Magnet-ring sensor

Laser-transmit

Relay module

Obstacle avoidance sensor

Metal touch sensor

18b20 Temperature sensor

Photo resistor sensor

Rotate-encode

Digital-temperature sensor

Infrared-Receive sensor

Analog-temperature sensor

Joystick PS2

RGB LED

Microphone sensor

Passiver buzzer

Humiture sensor

Two-color commoncathode LED

Magnetic spring

Tilt-Swith

Analogy-hall sensor

Knock sensor

Finger-Pulse Sensor module

Linear-Hall sensor

Active buzzer

Hall sensor

Colorful Auto-flash

Common-Cathode RED&GREEN LED module

High-Sensitive voice sensor

Push button

Light break sensor

Hydrargyrum-switch sensor

Tracking sensor

Shock-switch sensor

RGB LED module

Infrared-transmit

Magic-ring

Different Sensors for Raspberry Pi

Raspberry Pi GPIO Header Reference

	Pin	Pin	
3V3 Power	1	2	**5V** Power
GPIO2 SDA1 I2C	3	4	**5V** Power
GPIO3 SCL1 I2C	5	6	**Ground**
GPIO4	7	8	**GPIO14** UART0_TXD
Ground	9	10	**GPIO15** UART0_RXD
GPIO17	11	12	**GPIO18** PCM_CLK
GPIO27	13	14	**Ground**
GPIO22	15	16	**GPIO23**
3V3 Power	17	18	**GPIO24**
GPIO10 SPI0_MOSI	19	20	**Ground**
GPIO9 SPI0_MISO	21	22	**GPIO25**
GPIO11 SPI0_SCLK	23	24	**GPIO8** SPI0_CE0_N
Ground	25	26	**GPIO7** SPI0_CE1_N
ID_SD I2C ID EEPROM	27	28	**ID_SC** I2C ID EEPROM
GPIO5	29	30	**Ground**
GPIO6	31	32	**GPIO12**
GPIO13	33	34	**Ground**
GPIO19	35	36	**GPIO16**
GPIO26	37	38	**GPIO20**
Ground	39	40	**GPIO21**

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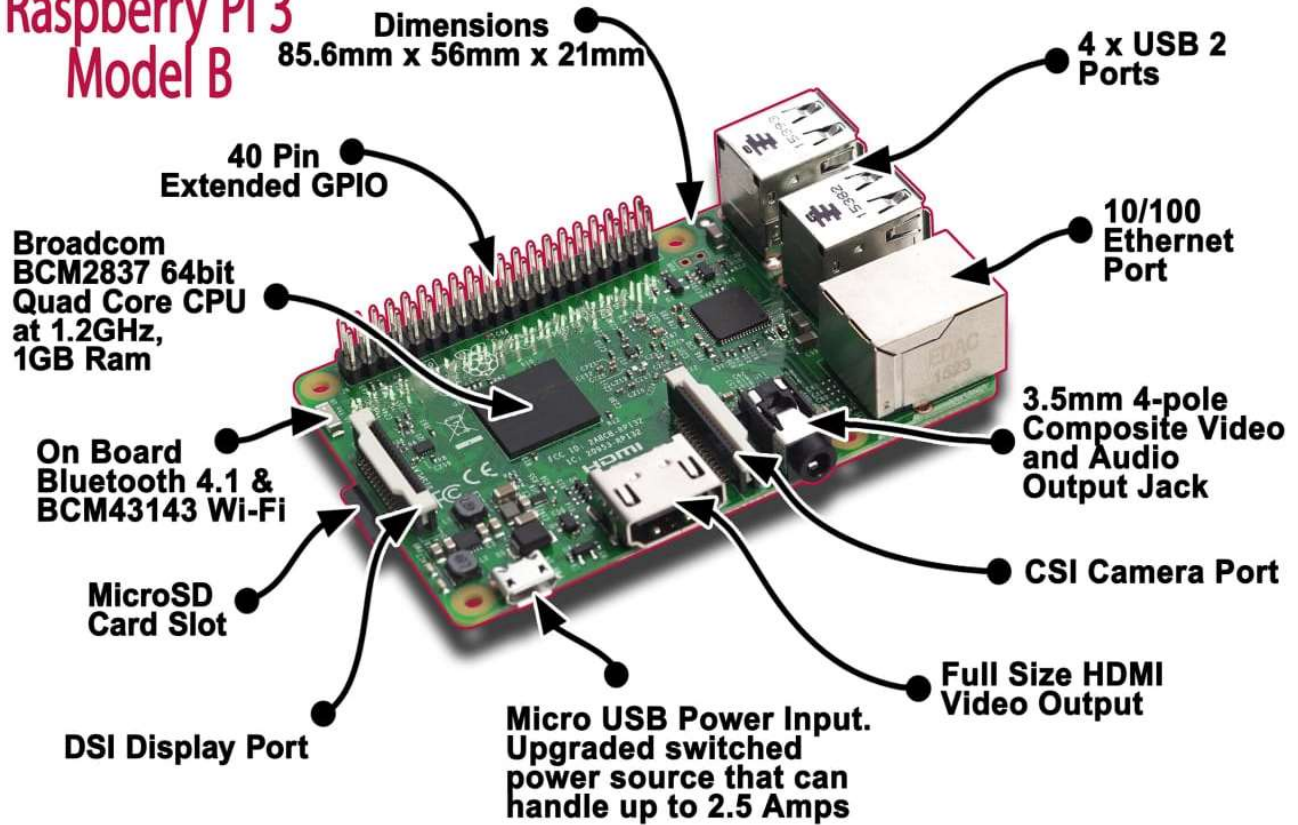Reaccredited by NAAC with B grade (CGPA 2.82)

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Raspberry Pi 3 Model B

Dimensions
85.6mm x 56mm x 21mm

4 x USB 2 Ports

40 Pin Extended GPIO

Broadcom BCM2837 64bit Quad Core CPU at 1.2GHz, 1GB Ram

10/100 Ethernet Port

On Board Bluetooth 4.1 & BCM43143 Wi-Fi

3.5mm 4-pole Composite Video and Audio Output Jack

MicroSD Card Slot

CSI Camera Port

DSI Display Port

Full Size HDMI Video Output

Micro USB Power Input. Upgraded switched power source that can handle up to 2.5 Amps
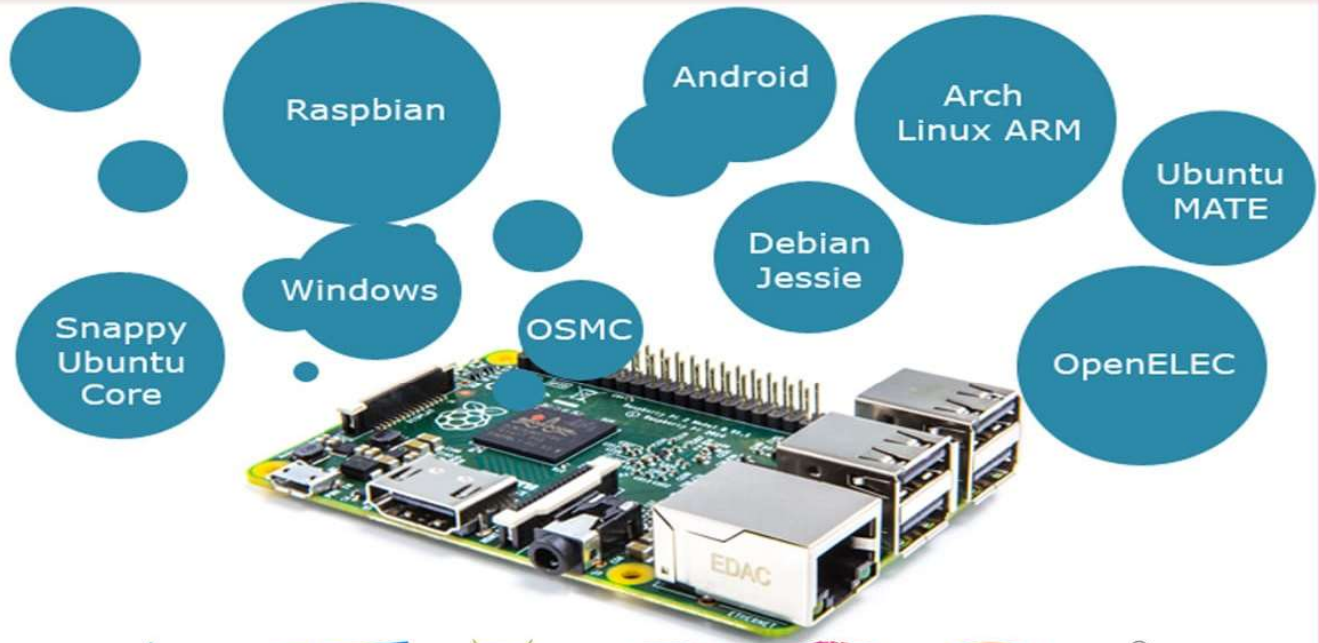
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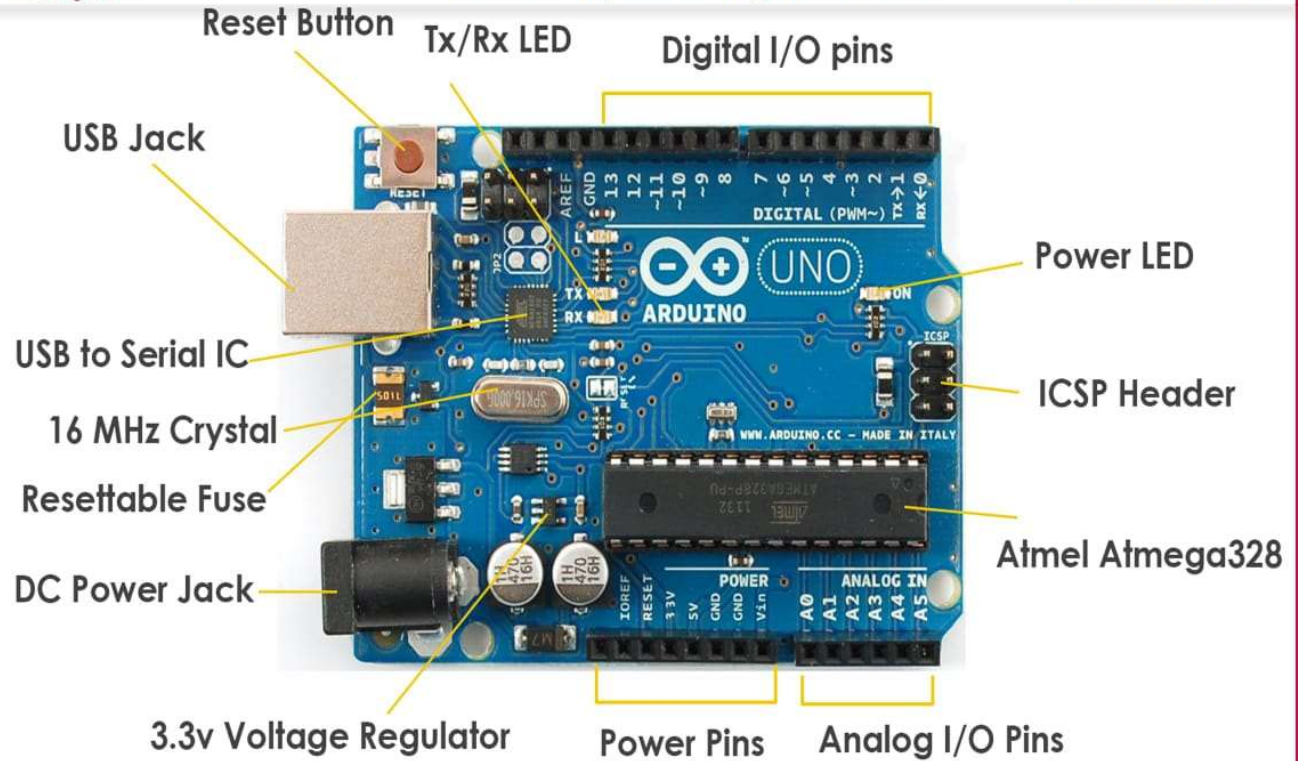# Different Operating Systems for Raspberry Pi

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Reset Button   **Tx/Rx LED**   **Digital I/O pins**

USB Jack

USB to Serial IC

16 MHz Crystal

Resettable Fuse

DC Power Jack

3.3v Voltage Regulator   **Power Pins**   **Analog I/O Pins**

Power LED

ICSP Header

Atmel Atmega328

Arduino Uno

HoD,
Computer Science & Application,
G S Science, Arts & Commerce College,
Khamgaon.