

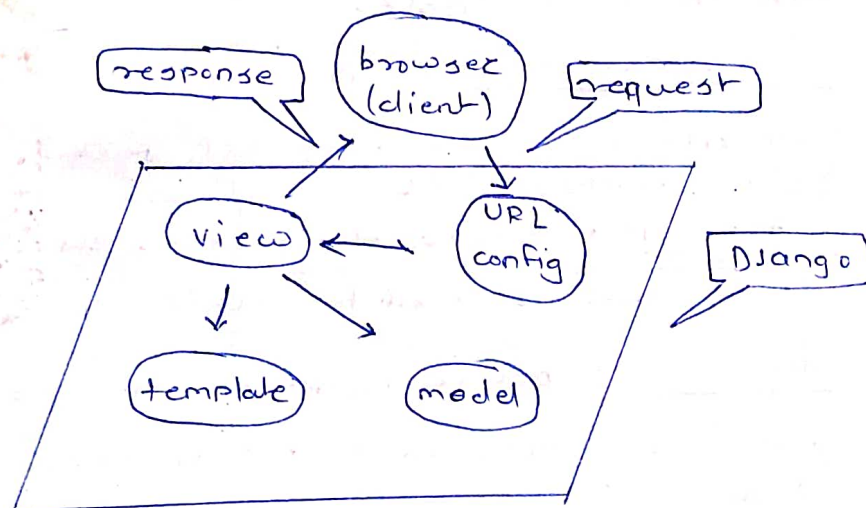
## Django & architecture & template IoT

- python web appl<sup>n</sup> framework: Django
- it is open-source python web development framework, it is based on model-template-view architecture.
- it is registered trademark of Django s/w Foundation & licensed under BSD License.

### Architecture !:

it often referred to as an MTV framework.

1. M stands for "Model", the data access layer. the layer contains any thing & everything about data. how to access.
2. T for "template". it is presentation layer. This layer contains presentation related decisions. how something should be displayed on web page.
3. V stands for "view". the business logic layer. This layer contain logic that access model & defer to appropriate template.



Architecture of Django

- Django was built using python, an object-oriented appl<sup>n</sup> development language which combines power of system language, such as C/C++, Java, with ease & rapid development of scripting language, such as ruby & visual basic.

## template :-

- Django template is a string of text that is intended to separate the presentation of document from its data.
- template defines placeholders & various bits of basic logic.
- The easiest way to create template object is to instantiate it directly. The template class lives in "django template" module.

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## AWS web services, auto scaling & advantages & functions of Amazon EC2.

- AWS is collection of remote computing service that together make up a cloud computing platform, offered over internet.
- The AWS cloud infrastructure is built around regions & availability zones (AZs).
- A region is physical location in the world where we have multiple AZs.
- These AZs offer you the ability to operate production appl<sup>n</sup> & databases that are more highly available.

## \* auto scaling :-

- it is a service offered by Amazon web services that helps customer automatically adjust their Amazon EC2 capacity according to current load.
- auto scaling can be used for auto scaling IOT appl<sup>n</sup> & IOT platforms deployed on Amazon EC2.
- auto scaling consists of four components

### 1. Launch Configuration (LC):

LC tells auto scaling how to configure the EC2 instances it launches.

### 2. Auto scaling Group (ASG):

it defines where EC2 instances described in LC will run, what the minimum no of instances.

3. Auto scaling policy (ASP):

define how an ASG should be changed whether increase or decrease

4. scheduled Action (SA)

it is an action that is triggered at specific time to decrease or increase no of EC2 instance running in ASG

• functions & advantages of Amazon EC2

1. local variety of OS

2. install custom appl<sup>n</sup>

3. manage network access permission

4. run image using many/few system.

Advantages :-

1. user have complete control of Amazon EC2

2. support flexible cloud hosting service

3. it enables you to increase or decrease capacity within minutes.

Raspberry pi :-

• A raspberry pi is credit-card sized

computer originally designed for education, inspired by 1981 BBC micro.

• creator eben upson's goal was to create low-cost device that would improve device that would improve programming skills & h/w.

• raspberry pi is slower than modern computer & laptop but still complete linux computer & can provide all expected abilities.

Audio

LEDs



# Components of Raspberry

• raspberry pi does not have separate CPU, RAM, or GPU.

• raspberry pi is open h/w with exception of its primary chip.

Processor : raspberry pi uses ARM

Processor which also installed

• CPU is single core, however it does have co-processor

Memory : • model B raspberry pi has 512 MB SDRAM (synchronous dynamic RAM)

• it stores program that are currently run on CPU.

USB ports : Board has two USB

port. USB port can provide a current upto 100 mA.

HDMI Output : high definition

multimedia interface (HDMI) supports high-quality digital video & audio through single cable.

Composite video o/p : it supports

composite video o/p with RCA jack & also supports PAL

Audio o/p : audio o/p jack is 3.5mm

This jack is used for audio o/p

GPIO pins : newer Raspberry pi adds

8 more GPIO pins in a new header

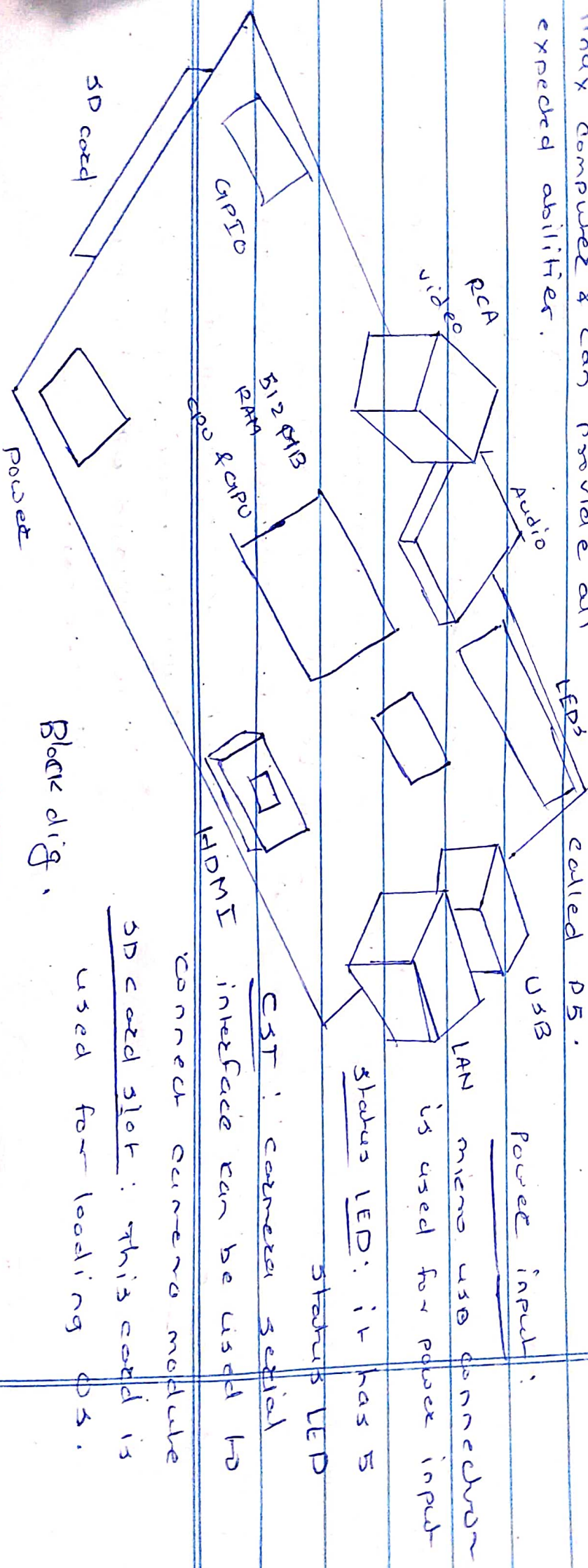
called P5.

Programming skills & h/w.

This page is used for audio D/P

Raspberry pi is slower than modern computer & laptop but still complete linux computer & can provide all expected abilities.

GPIO pins: newer Raspberry pi adds 8 more GPIO pins in a new header called P5.



Block dig.

SD card slot: this card is used for loading OS.

connect camera module

CSI: camera serial interface can be used to

status LED

LAN is used for power input

Power input:

micro-USB connector



## Cloud storage & advantages IOT

- cloud computing refers to a variety of services available over the internet that deliver compute functionality on the service provider infrastructure.
- using internet for communication & transport provider H/W & s/w & networking service to clients.
- cloud storage delivers virtualized storage on demand, over a network based on a request for given QoS.
- There is no need to purchase storage ~~or in some cases~~
- You only pay for amount of storage your data is actually consuming.
- cloud storage service may be accessed through a web service API.
- several large web companies (amazon & google) are now exploiting the fact that they have data storage capacity that can be hired out to others.
- This approach known as cloud storage allows data stored remotely to be temporarily cached on desktop.

### Advantages of cloud

- companies do not need to install physical storage ~~they actually use~~ devices in their own data center.
  - organizations need only pay for storage they actually use as it is also possible for companies by utilizing actual virtual storage.
  - cloud storage provides users with immediate access to broad range of resource & applications hosted in infrastructure.
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## pcDuino :-

- pcDuino is a high performance, cost effective mini PC platform that runs PC like OS such as ubuntu Linux.

2 - It outputs its screen to HDMI enabled TV or monitor via the built HDMI interface.

je - it is specially targeted for the fast growing demands from open source community.

c - ~~It o/p its screen to HDMI enabled TV or monitor via the built~~.

### Advantages :-

1. Affordability, size, power consumption
2. Flexibility with display.
- d 3. Compatibility with arduino.

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## Beaglebone board :-

- it is low-cost, open source, community supported development platform for ARM.
- The BB h/w platform is well suited to acting as a proto trying platform & learning tool for android OS.
- it supports windows CE, Linux & ical Symbian OS.

### characteristics :

- support USB 2.0 host port
- je • lower power consumption
- it support 1 GHz superscalar ARM cortex-A8.
- new micro-HDMI audio/visual o/p.
- beaglebon offers flexible language system where you can use javascript, c/c++, python, perl.

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## Cubieboard :

- it is single-board computer, made in zhuhai, guangdong, china.
- it can run Android, ubuntu, fedora

### H/w specification :-

- CPU, 1 or 2 core CPU optional
- 1 GB DDR3, 2D/3D GPU
- 4 GB NAND flash, 2160P HD video



- software specification
- Preinstall android 4.x
- support ubuntu 12.04 desktop
- support Fedora 18, Debian linux, kali linux.

## WAMP & Components of WAMP ?

- WAMP stands for Web application messaging protocol.
- it is sub-protocol of web-socket & provider publish-subscribe & all RPC messaging pattern.
- it support distributed appl<sup>n</sup> architecture.
- Appl<sup>n</sup> components are distributed & run on mobile nodes & WAMP provider communication is bet<sup>n</sup> them.
- WAMP does not make any extra standard,
- web socket standard is default transport channel where wamp is binding.
- The pubsub messaging pattern defines 3 roles: subscribers & publisher, which communicate via broker.
- & Rpc messaging pattern also defines 3 roles: - caller & callee which communicate via dealer.

## Key components of WAMP :-

1. Transport: It is communication channel which connect two peers. websocket is default transport for WAMP.
2. Session: conversation bet<sup>n</sup> two is called session.
3. Client: clients are peer that can have one or more roles.