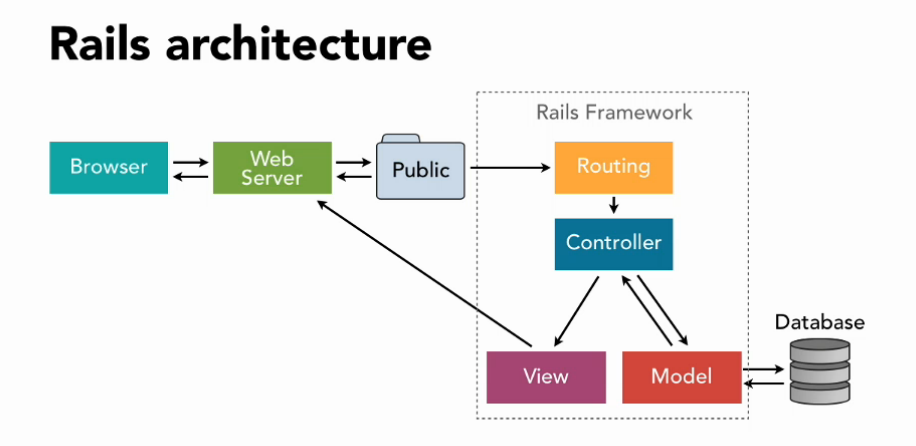
T2A1-A Workbook

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# Q1 Describe the architecture of a typical Rails application



Ruby on rails is a simple useable framework for full-stack web app development with a database backend. And it follows Model, View and Controller patten which also MVC architecture patten.

* Model – manage the business logic and storage of database. In rails application, model also connect with the database, deal with validation, data storage, data transaction and data table attributions. And it also can add to database, find, update and delete particular data, which we can call it CRUD (create, read, update and destroy).
* View – manage the user interface and representing the information to the customer(end-user). And it is front-end of the application. The view are hybrid files with normal HTML structure, and also use embedded Ruby code.

Assets are normally store and supply visual components such as CSS, JavaScript and other media files (image, wav, movie, etc.)

* Controller – is a connector between View and Model. The requests from browser go through routes, and we use controller to specify the requests (read, create, update or destroy), to call the MODEL for the data then transfer to the VIEW then to the web server.
* Routes – convert URL path into form which more understandable when we develop applications.

To understand the architecture, here s an example, when we input localhost:3000 in browser, it gives the serve (Get) request which go through Routes (config/routes.rb). The it will send the request to the Controller (hello\_controller.rb) and execute the action (index). In action, if it has model action (CRUD) it will find the database then jump to the VIEWS (index.html.erb). then back to the web server.

# Q2 Identify a database management system (DBMS) commonly used in web applications (including Rails) and discuss the pros and cons of this database

Database management system (DBMS) normally use to add, access and process data in computer database.

MySQL is one of most popular DBMS helps developers with their applications. And there are advantages and disadvantages of MySQL.

### Advantages

* Small volume, quick speed, low cost of ownership, open source, support for multiple operating systems.
* Is open-source database, the interface to support multiple language connection operation.
* The core thread it uses is completely multi-threaded and it support multi-processor. And it threads are lightweight processes that can flexibly serve users without excessive system resources.
* a very rapid and stable memory allocation system based on thread, can keep using it without consider about the stability.
* MySQL has a very flexible and secure permission and password system. When a client connects to a MySQL server, all password transfers between them are encrypted, and MySQL supports host authentication.

### Disadvantages

* Hot backup not supported.
* The biggest drawback of MySQL is its security system, the main reason is it complex and non-standard, and only can be changed when you call mysql admin to re-read the user rights.
* If you have a large number of stored procedures, the memory that used for each connection to these stored procedures will increase significantly. In addition, if you overuse a large number of logical operations in a stored procedure, CPU utilization increases. This is why it is not efficient for very large database.
* The price of MySQL may vary with different platform and installation. And compare to other paid database management systems, it lacks a good developing and debugging tool.

# Q3 Discuss the implementation of Agile project management methodology

# Q4 Provide an overview and description of a standard source control workflow

# Q5 Provide an overview and description of a standard software testing process (e.g., manual testing)

# Q6 Discuss and analysis requirements related to information system security and how they relate to the project

# Q7 Discuss common methods of protecting information and data and how you would apply them to the project

# Q8 Research what your legal obligations are in relation to handling user data and how they can be met for the project

# Q9 Describe the structural aspects of the relational database model. Your description should include information about the structure in which data is stored and how relations are represented in that structure.

# Q10 Describe the integrity aspects of the relational database model. Your description should include information about the types of data integrity and how they can be enforced in a relational database.

# Q11 Describe the manipulative aspects of the relational database model. Your description should include information about the ways in which data is manipulated (added, removed, changed, and retrieved) in a relational database.

# Q12 Conduct research into a marketplace website (app) and answer the following parts:

### List and describe the software used by the app.

### Describe the hardware used to host the app.

### Describe the interaction of technologies within the app

### Describe the way data is structured within the app

### Identify entities which must be tracked by the app

### Identify the relationships and associations between the entities you have identified in part (e)

### Design a schema using an Entity Relationship Diagram (ERD) appropriate for the database of this website (assuming a relational database model)