

Guide2Code - Ruby Programming Roadmap

◆ Phase 1: Beginner Level

📌 Topics to Learn:

1. Introduction to Ruby (Installation, IRB, Basic Syntax)
2. Variables & Data Types (String, Integer, Float, Boolean, Arrays, Hashes)
3. Operators (Arithmetic, Comparison, Logical, Bitwise)
4. Control Flow (if-else, case-when, ternary operator)
5. Loops & Iterators (while, for, times, each, map)
6. Methods (Defining, Calling, Arguments, Return Values)
7. Strings & String Manipulation
8. Arrays & Hashes (Operations, Methods, Iterating)
9. Exception Handling (begin-rescue, raise, ensure)
10. File Handling (Reading, Writing, Appending Files)

🚀 Beginner Project Ideas:

- 📱 **Simple Calculator** – Perform basic arithmetic operations
- 📊 **Student Grade Calculator** – Input marks and display grades
- 🎲 **Number Guessing Game** – User guesses a number, program gives hints
- 🌡️ **Temperature Converter** – Convert Celsius ↔ Fahrenheit
- 📅 **Age Calculator** – Calculate age based on date of birth
- 🏧 **Bank Account System** – Basic deposit and withdrawal operations







◆ Phase 2: Intermediate Level

📌 Topics to Learn:

1. Object-Oriented Programming (Classes, Objects, Inheritance, Polymorphism)
2. Modules & Mixins (Include, Extend, Prepend)
3. Regular Expressions (Pattern Matching, Regexp class)
4. Metaprogramming (Dynamic Methods, send, define_method)
5. Blocks, Procs, and Lambdas

6. Database Handling with SQLite & PostgreSQL (ActiveRecord)
7. APIs and Web Requests (net/http, open-uri, rest-client)
8. Debugging & Logging (puts, logger, pry, byebug)

Intermediate Project Ideas:







-  **Library Management System** – Manage books, borrowers, and returns
-  **Contact Management System** – Store, edit, and delete contacts
-  **Email Sender** – Automate sending emails using SMTP
-  **To-Do List App** – Manage and store tasks
-  **Web Scraper** – Extract information from websites using Nokogiri
-  **Simple Game (Tic-Tac-Toe, Hangman)** – Create interactive games

Phase 3: Advanced Level

Topics to Learn:

1. Advanced OOP Concepts (Singleton Pattern, Design Patterns)
2. Metaprogramming & Reflection (method_missing, define_method)
3. Ruby on Rails (MVC Framework, ActiveRecord, REST API)
4. Web Development with Sinatra & Rack
5. Multi-threading & Concurrency (Threads, Fibers)
6. Security in Ruby (Encryption, Hashing, JWT Authentication)
7. Cloud & DevOps (Deploying Ruby Apps on AWS, Heroku, Docker)
8. Machine Learning with Ruby (SciRuby, TensorFlow.rb)

Advanced Project Ideas:

-  **Weather Forecast App** – Fetch and display live weather data
-  **Chat Application** – Real-time chat using WebSockets
-  **Stock Price Predictor** – Use machine learning to predict stock trends
-  **E-commerce Website** – Build a functional shopping platform with Rails
-  **AI-Powered Chatbot** – Automate customer support using NLP
-  **Face Recognition System** – Detect and recognize faces using AI