# Guide2Code - PowerShell Programming Roadmap

🟢 **Phase 1: Beginner Level**

📚 **Topics to Learn:**

1. Introduction to PowerShell (Installation, Setup, Execution Policies)

2. Basic Syntax & Commands (cmdlets, aliases, parameters)

3. Variables & Data Types (Strings, Numbers, Arrays, HashTables)

4. Control Flow (if-else, switch, loops)

5. Functions & Scripting (Defining functions, passing parameters)

6. File & Directory Management (Creating, Reading, Writing Files)

7. Working with Objects (Object Properties, Methods, Pipelines)

8. Basic Error Handling (Try-Catch, Throw, Finally)

9. Importing & Exporting Data (CSV, JSON, XML)

10. Debugging & Logging (Write-Host, Write-Output, Transcripts)

🛠️ **Beginner Project Ideas:**

- **System Information Script** – Display OS, CPU, and RAM details

- **File Organizer** – Automatically sort files into folders

- **User Account Manager** – Create and modify user accounts

- **Simple Task Scheduler** – Automate script execution at intervals

- **Basic Backup Script** – Copy important files to a backup location

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🟡 **Phase 2: Intermediate Level**

📚 **Topics to Learn:**

1. Advanced Scripting (Script Blocks, Functions with Parameters)

2. PowerShell Remoting (Enable-PSRemoting, Invoke-Command)

3. Working with Active Directory (Get-ADUser, Get-ADGroup)

4. Managing Services & Processes (Start-Service, Get-Process)

5. Registry Management (Get-ItemProperty, Set-ItemProperty)

6. Scheduled Tasks & Automation (New-ScheduledTask, triggers)

7. Windows Event Logs (Get-EventLog, Exporting Logs)

8. Working with APIs & Web Requests (Invoke-RestMethod, JSON Parsing)

9. Error Handling & Debugging (Verbose Output, Breakpoints)

10. Performance Monitoring (Get-Counter, Event Tracing)

🛠 **Intermediate Project Ideas:**

- **User Creation & Management Tool** – Automate AD user creation

- **System Health Monitor** – Monitor CPU, RAM, and disk usage

- **Log Analysis Script** – Analyze and extract errors from logs

- **Automated Software Installer** – Install software using PowerShell

- **Scheduled Backup System** – Backup important files regularly

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🔴 **Phase 3: Advanced Level**

📚 **Topics to Learn:**

1. Working with APIs (OAuth, RESTful API authentication)

2. PowerShell for DevOps (CI/CD Automation, GitHub Actions)

3. Desired State Configuration (DSC for Infrastructure Automation)

4. Security & Compliance (Encrypting data, Securing scripts)

5. Managing Azure with PowerShell (Azure CLI, Az module)

6. Writing Advanced Modules (Creating reusable PowerShell modules)

7. Windows Server Administration (Managing users, roles, policies)

8. Performance Optimization (Parallel Execution, Background Jobs)

9. Reverse Engineering & Debugging (Analyzing scripts, Forensics)

10. Cloud Automation (AWS, Azure, Google Cloud PowerShell modules)

🛠 **Advanced Project Ideas:**

- **Automated Cloud Resource Manager** – Manage Azure/AWS resources

- **Enterprise System Monitoring Tool** – Advanced system monitoring

- **Security Audit Script** – Scan system vulnerabilities & logs

- **Custom PowerShell Module** – Develop a reusable module for admins