# Rapid Fire C# Interview Questions and Answers (1-4 Years Experience)

## OOPs and C# Fundamentals

### 1. What are the four pillars of OOP in C#?

Encapsulation, Abstraction, Inheritance, Polymorphism  
  
Example:  
  
public class Animal { public virtual void Speak() { Console.WriteLine("Animal speaks"); } }  
public class Dog : Animal { public override void Speak() { Console.WriteLine("Dog barks"); } }

### 2. Difference between Abstract Class and Interface?

Abstract class: Can have method implementations. Single inheritance.  
Interface: Cannot have implementation (before C# 8). Multiple inheritance.  
  
Example:  
  
interface IWalk { void Walk(); }  
abstract class Animal { public abstract void Eat(); }  
class Dog : Animal, IWalk { public override void Eat() { } public void Walk() { } }

### 3. Method Overloading vs Overriding?

Overloading: Same method name, different parameters.  
Overriding: Derived class modifies the behavior of base class method.  
  
Example:  
  
void Print(int x) { }  
void Print(string x) { }  
  
public override string ToString() { return "Dog"; }

### 4. Access Modifiers Example

public class MyClass  
{  
 private int \_id;  
 protected int Age;  
 public void Show() { }  
}

### 5. Difference between == and .Equals()?

== compares references (unless overloaded), .Equals() compares values.

### 6. What is Dependency Injection?

public class OrderService  
{  
 private readonly IEmailService \_email;  
 public OrderService(IEmailService emailService) { \_email = emailService; }  
}

### 7. What is async and await?

public async Task<int> GetDataAsync() {  
 await Task.Delay(1000);  
 return 42;  
}

### 8. Difference between IEnumerable and IQueryable?

IEnumerable: In-memory execution.  
IQueryable: Database-level execution.

## SQL and PostgreSQL

### 9. What is an Index in SQL?

CREATE INDEX idx\_user\_email ON Users(Email);

### 10. Find Duplicate Records?

SELECT Email, COUNT(\*) FROM Users GROUP BY Email HAVING COUNT(\*) > 1;

### 11. INNER JOIN vs LEFT JOIN?

INNER JOIN: Only matching records.  
LEFT JOIN: All left table records.

### 12. How to handle transactions in PostgreSQL?

BEGIN;  
UPDATE accounts SET balance = balance - 100 WHERE id = 1;  
UPDATE accounts SET balance = balance + 100 WHERE id = 2;  
COMMIT;

### 13. Clustered vs Non-Clustered Index in PostgreSQL?

Clustered: Data stored physically in order.  
Non-Clustered: Separate index structure.

## Azure Cloud and DevOps

### 14. What is Azure App Service?

PaaS to host web apps and APIs without managing infrastructure.

### 15. How to implement CI/CD in Azure DevOps?

CI: Build pipelines.  
CD: Release pipelines.

### 16. What is Azure Key Vault?

Secure storage for secrets, keys, and certificates.

### 17. How to monitor applications on Azure?

Azure Monitor and Application Insights.

## .NET Core and API

### 18. Explain .NET API Request Flow

Controller → Service Layer → Repository Layer → Database

### 19. Synchronous vs Asynchronous code?

Synchronous: Blocks thread.  
Asynchronous: Frees thread, better scalability.

### 20. What are Migrations in EF Core?

dotnet ef migrations add AddUserTable  
dotnet ef database update

## Internal vs Protected Internal Examples

### Internal Example

public class MyClass  
{  
 internal void ShowMessage() { Console.WriteLine("Hello from internal method!"); }  
}

### Protected Internal Example

public class Parent  
{  
 protected internal void Greet() { Console.WriteLine("Hello from protected internal!"); }  
}  
  
public class Child : Parent  
{  
 public void CallGreet() { Greet(); }  
}

## Final Tip

Always ask for 1-2 small code snippets.  
Focus on practical knowledge, not just theory.