



CS Career Paths: A **Practical** Guide

Common Questions

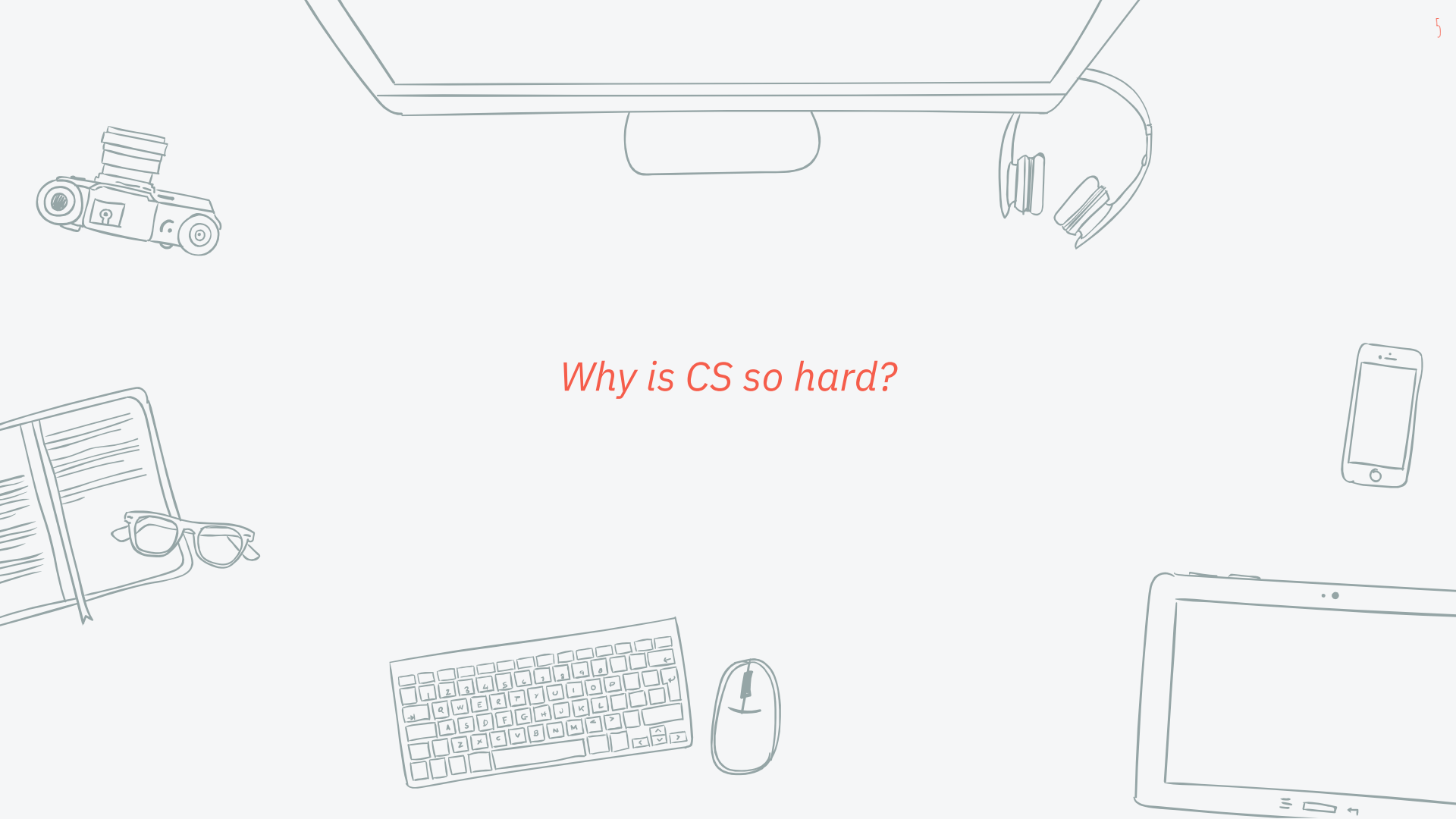


What programming language should I learn?

What field should I choose?



Why is CS so hard?

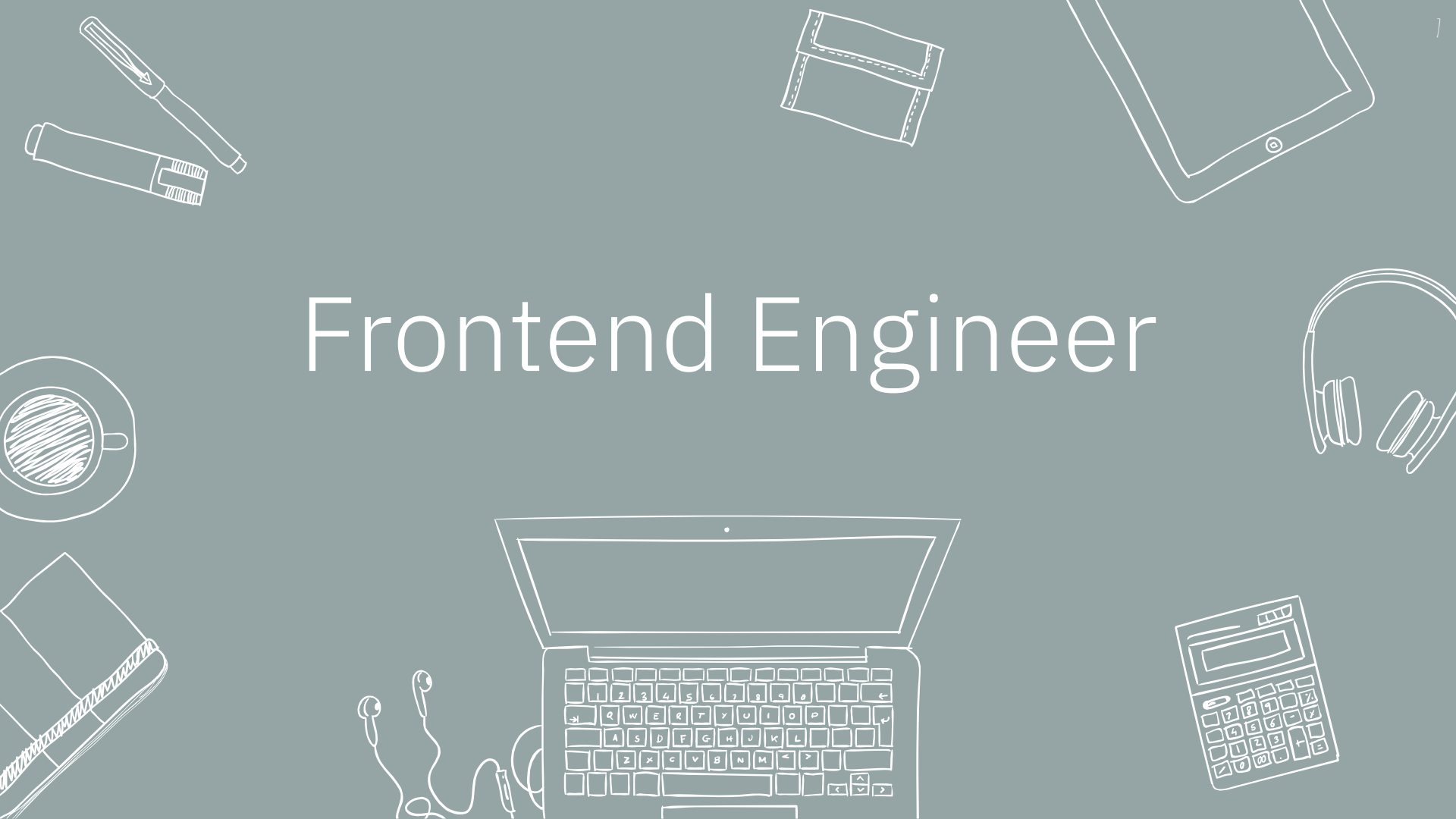




Overview

- 1) Frontend Engineer
- 2) Backend Engineer
- 3) Mobile Engineer
- 4) Game Developer
- 5) Data Science
- 6) Embedded Engineer
- 7) Security Engineer

Frontend Engineer





Summary

- Builds user-facing applications
- Think search bars, input boxes, etc
- Enhancing user experience



Skills & Concepts

- User Interface/Experience
- Responsive Design
- Search Engine Optimization (SEO)
- E2E testing

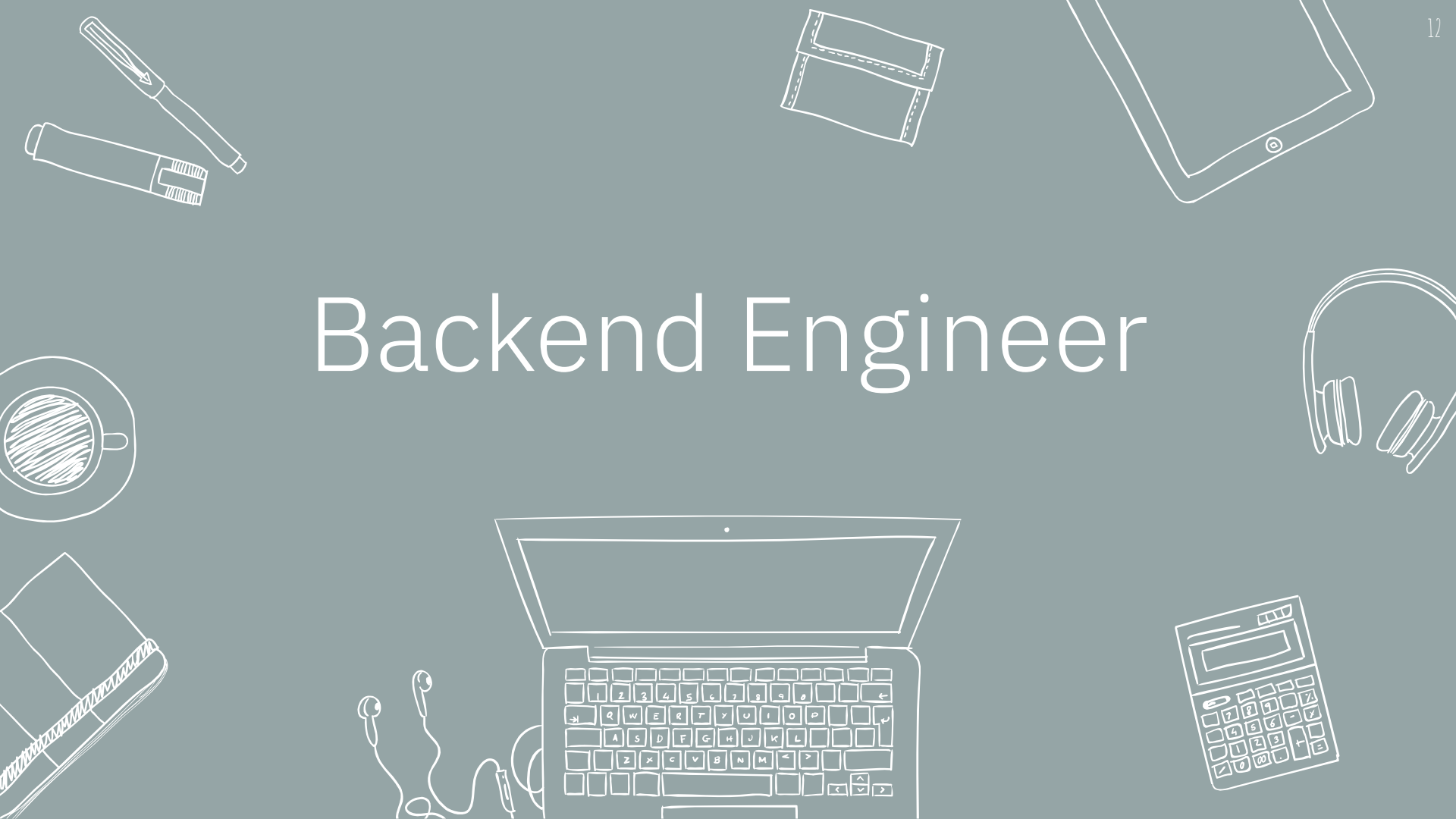
Programming Languages

- **HTML** - Building web elements
- **CSS** - Styling web elements
- **JS** - Client-side logic
- **PHP** - Dynamic Web Pages

Tools & Frameworks

- **React** (JavaScript)
- **Vue** (JavaScript)
- **Angular** (JavaScript)
- **Tailwind** (CSS)
- **Laravel** (PHP)

Backend Engineer



Summary

- Building server-side applications
- Think login, fetching data, etc
- Optimizing performance

Skills & Concepts

- RESTful APIs
- Database management
- Scaling applications
- Security protocols

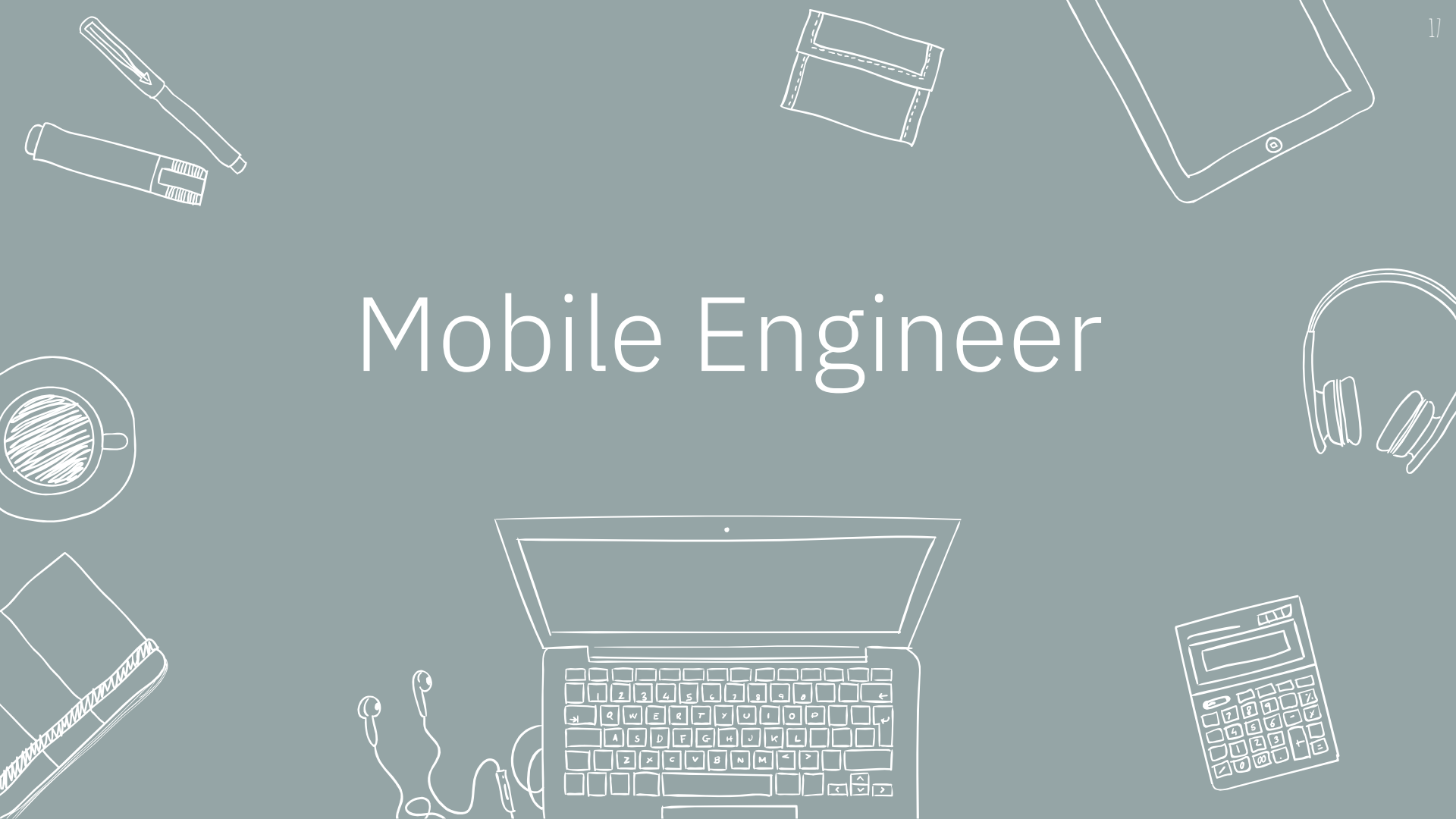
Programming Languages

- **Python** - Lightweight syntax
- **Java** - Garbage collected, C/C++ like syntax
- **C#** - Rich Windows ecosystem
- **Golang** - Concurrency and efficient memory model

Tools & Frameworks

- **Django** (Python)
- **Spring** (Java)
- **ASP.NET** (C#)
- **Gin** (Golang)

Mobile Engineer



Summary

- Build software for mobile devices
- Think apps
- Utilize analytics to capture ever-changing trends

Skills & Concepts

- User Interface Design
- Device security
- Operating Systems
- Power Consumption

Programming Languages

- **Java** - Powers the Android OS
- **Kotlin** - JVM, concise syntax
- **Swift** - Building IOS apps
- **Dart** - Fast cross-platform apps

Tools & Frameworks

- **Android Studio**
- **Flutter** (Dart)
- **SwiftUI** (Swift)
- **React Native** (JavaScript)

Game Development



Summary

- Design and develop games for various platforms
- Think Call Of Duty, Among Us, etc
- Turns a story into reality

Skills & Concepts

- Creativity
- Digital Art
- Shaders
- Optimization

Programming Languages

- **C#** - Object-oriented nature
- **C++** - Fast, lower-level programming
- **C** - Fast, lower-level programming
- **Lua** - Easily embedded, performance

Tools & Frameworks

- **Unity** (C#)
- **Unreal Engine** (C++)
- **LÖVE** (Lua)
- **SDL2** (C)

Data Science



Summary

- Proces, model and analyze data
- Think text-to-speech, chess engine, etc
- Use modern tool to navigate the vast sea of data

Skills & Concepts

- Data Visualization
- Web Scraping
- Machine Learning
- Artificial Intelligence

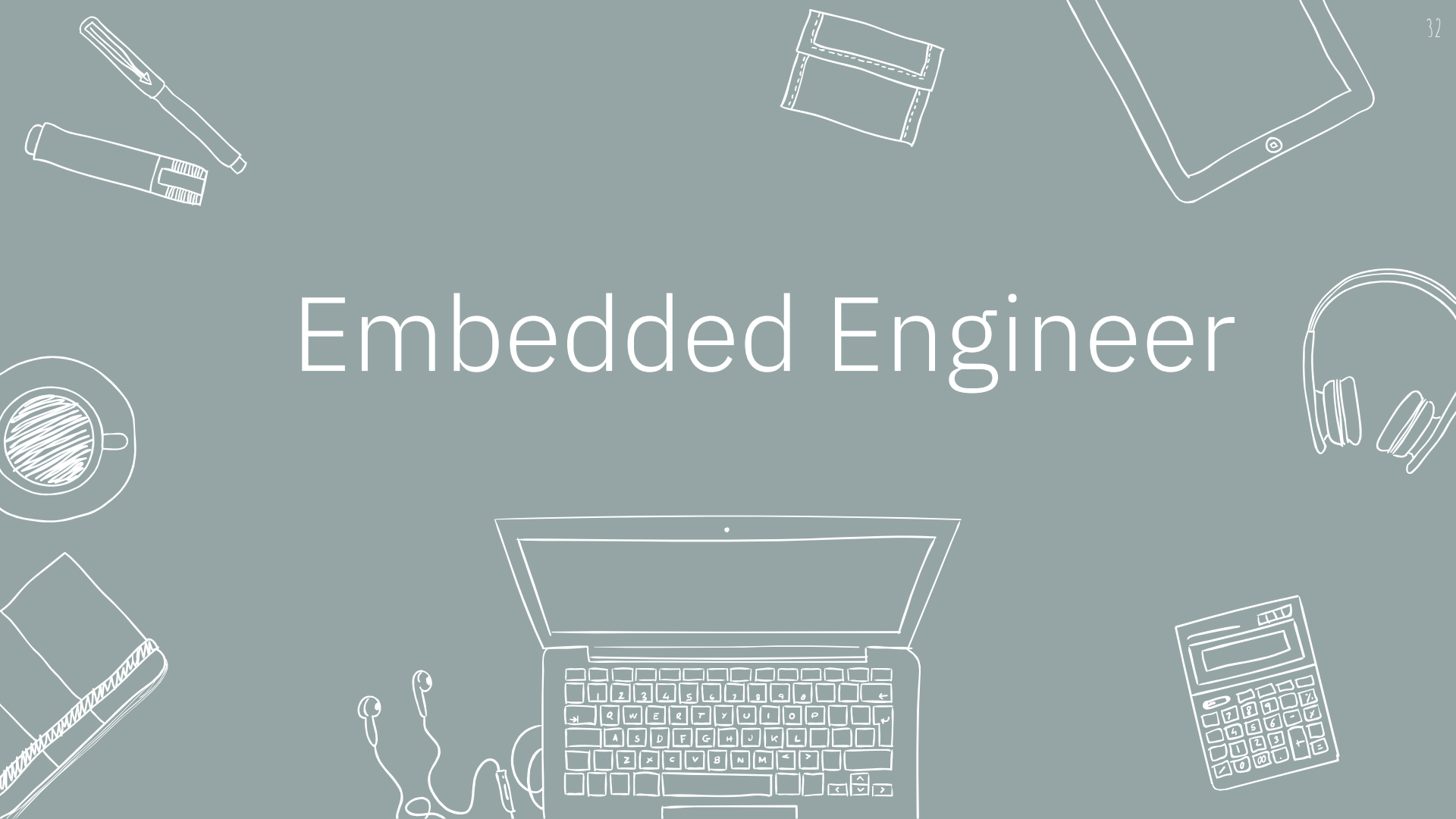
Programming Languages

- **Python** - Approachable syntax, many data science-related libraries
- **R** - Powerful data viz libraries
- **Julia** - High-speed computation
- **SQL** - Persisting data

Tools & Frameworks

- **Scrapy** (Python)
- **Keras** (Python)
- **Ggplot2** (R)
- **MySQL** (SQL)

Embedded Engineer



Summary

- Build applications that target a wide variety of electronic devices
- Think Tesla, Smart card readers
- Can be thought of as a cross between software and electrical engineers

Skills & Concepts

- Microcontrollers
- Integrated Circuits
- Communication protocols
- Hardware architecture

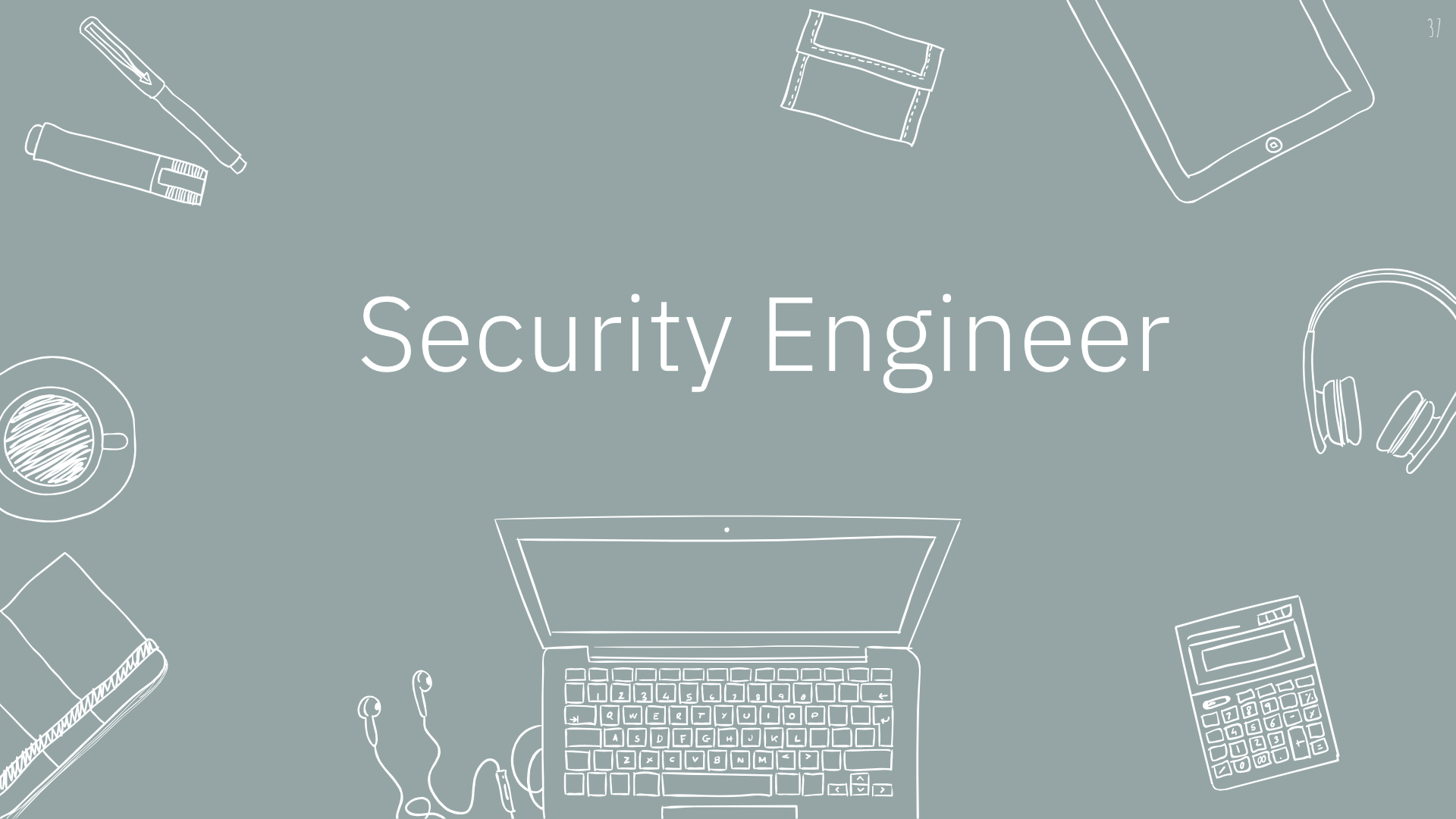
Programming Languages

- **C++** - Interface with system hardware
- **C** - Optimized machine instructions
- **Assembly** - Can't get any lower than this
- **Python** - Real-time visualizations

Tools & Frameworks

- **Arduino** (Java/C++)
- **Raspberry Pi** (Python)
- **QT** (C++)
- **Linux**

Security Engineer



Summary

- Implementing and monitoring security systems
- Think banks, fintech
- Strong background in cybersecurity

Skills & Concepts

- Networking
- Cryptography
- Database Management
- Operating Systems

Programming Languages

- **Powershell** - CLI, Windows environment
- **Bash** - CLI, Unix environment
- **Assembly** - Seeing how malware functions
- **Python** - Task automation



Tools & Frameworks

- **Scapy** (Python)
- **ISO**
- **Oauth2**
- **Kali Linux**

Helpful Resources

[StackShare](#)

[CSCareers](#)

[Glassdoor](#)

[GitHub](#)

[LinkedIn](#)