Software Proficiencies

This document aims to provide clarity on current level of proficiency within listed languages and technologies as well as providing an overview of the works completed during this period of professional development, research and training.

Language	Proficiency	Overview
Crestron / AMX	Advanced	Fully accredited in Crestron and AMXwith over 12 years experience providing systems throughout UK, Europe and worldwide.
Java SE	Advanced	x3 significant projects combined with substantial training, research, books and courses as detailed below.
Java FX	Advanced	x3 significant projects combined with substantial training, research, books and courses as detailed below.
Spring	Intermediate	Training, research, books and courses as detailed below.
Kotlin	Intermediate	Training, research, books and courses as detailed below.
SQL	Intermediate	SQL is used substantially within x2 of my Java/JavaFX projects for interaction with embedded JavaDB.
XML HTTP REST	Intermediate	XML is the foundation of JavaFX and many modern platforms, completed training, research and courses as detailed below.
Git / GitHub	Intermediate	Training, research, books and courses as detailed below.
Android	Basic	Training, research, books and courses as detailed below.
HTML / CSS / PHP / mySQL	Basic	Completed substantial personal project 'nationalsyndicate.org.uk' however this was back in 2004-2005.
Kubernetes / Docker	Basic	Training, research, books and courses as detailed below.
Workflows / Build Tools	Basic	Training, research, books and courses as detailed below.

Please find below a detailed breakdown of the research and general areas/level of proficiency within the languages/technologies listed above. The below corresponds to a concise summary of the condensed research and reference material of key concepts, constructs and syntax I have produced within the Research folder of this repository.

Java SE

Top Level

- Class
- Abstract Class
- Interface
- Enum

Nested Types

- Types
  - Local Class
  - Inner Class
  - Static Nested Class
  - Anonymous Class
  - Lambda Expressions
  - Method Reference
- Members
  - Permitted Members
  - Access to Outer Scopes
  - Shadowing
  - Final or Effective Final
- Nesting Principles
- Memory Depiction
- Instantiation From External Scopes

Static Nested Class

- Effective Top Level Class
- Internal Memory Depiction
- Permitted Access to Outer Scopes
- Instantiation From External Scopes

Anonymous Class

- Header / Body Syntax
- Anonymous Object
  - Extended Class
  - Inline Implementation
- Access to Outer Scopes

Lambda Expression

- Purpose / Intended Use
- Functional Interface
- Parameters / Body Syntax
  - Zero Parameters
  - Multiple Parameters
  - Explict Parameters
  - Implicit Target Type
- Access to Outer Scopes

Enum

Declaration / Definition

- Header / Body Syntax
- Enum Constants
- Enum Constructor
- Memory Compostion

Class

Declaration / Definition

- Header / Body Syntax
- Access Modifiers
- Memory Compostion
  - Static
  - Non-Static
- Overloading
- Overriding
- Shadowing
- Fields
  - Instance
  - Class
  - Constants
- Constructors
  - Default No Argument
  - Super Constructor
  - Constructor Chaining
- Initialisation Blocks
  - non-Static
  - Static

Methods

- Signature
- Parameter List
- Parameter Type
  - [ByValue]
  - Primitive
  - Arrays
  - VarArgs
  - Object Variable
  - Interface Variable
  - Method Ref.
  - Lambda Expression
- Ambiguity
- Scope / Access
- Covariant Return Type

Extending

- Compatibility

Interface Implementation

- Single
- Multiple
- Generic

Instantiation

- Declaration
- Allocation
- Initialisation
- Variable Referencing
- Member Referencing
- Garbage Collection

Interface

Declaration / Definition

- Header / Body
  - Structure
  - Syntax
- Memory Composition
  - Implicit Access Modifiers
- Members
  - Permitted
  - Unpermitted
- Fields
  - Constants Only
- Methods
  - Abstract
  - Static
  - Default
- Exending
  - Multiple Inheritance
  - non-Static Members
    - Aggregation
    - Non-Ambiguity
    - Non-Clashing
  - Consolidation

Class Implementation

- Abstract Method Implementation
- Abstract Method Aggregation
- No Ambiguity

Interface Variables

- Polymorphism
- Anonymous Objects
- Compatibility

Types

- Normal
- Functional
- Semantic
- Annotation

Instantiation

- Declaration
- Referencing
- Restrictions

Arrays

- Declaration / Allocation / Initialisation
- Utility Classes
  - System
  - java.util.Arrays
- Utility Methods
  - Sorting
  - Collection Conversion
  - Searching
  - Copying
  - Comparison

Blocks

- Permitted Usage
- Permitted Members
- Unpermitted Members

- Initialisation Blocks
- Initialisation Blocks
- Labelled Blocks

Annotations

- Declaration
  - Elements
- Deployment
  - Single
  - Multiple / Repeated
- Types
  - Annotation [Predefined]
  - Annotation Type [Custom]
  - Container Annotation Type
  - Meta-Annotations
  - Type Annotation

Static / non-Static Memory

Component

- Memory Composition
- Memory Depiction
- Memory Decpiction within nested components
- Memory Scope
- Memory Properties
  - Internal Composition
  - Location

Static Memory

- Permitted Members
  - Static Member Initialisation
  - Static Member Default Values
  - Static Member Referencing
- Permitted Referencing
- Nested Components
  - Nested Referencing
  - Outer Scope Referencing
  - Shadowing

non-Static Memory

- Permitted Members
- Permitted Referencing
- Default Values
- Nested Components
  - Nested Referencing
  - Outer Scope Referencing
  - Shadowing

Exceptions

- Checked / unchecked
- Chained exceptions
- Catch / specify requirement
- Throwable
- Exception
- try-catch-finally
- try-with-resources
- RuntimeException
- Error

Pipelines / Streams

- Aggregate Operations:
  - Source
  - Intermediate Operations
  - Terminal / Reduction Operations
- Ordering
- Laziness
- Interference
- Aggregate Operators v Iterators
- Collection Traversal
- Low Level Operation
- Side Effects

Generics

Application

- Class
- Interface
- Constructor
- Method
- Abstract Class
- Enum (Constructor)

Scope

- Local
- Class / Interface

Generic Class

- Declaration
  - Header / Body Syntax
  - Class Type Parameters
  - Local Type Parameters
  - Extension and Type Pass Up
  - Multiple Type Parameters
  - Hardcoded Type Parameters
  - Hierarchical Compatibility
- Invocation, Instantiation and Initialisation
  - Syntax
  - Parameterised Types
  - Type Inference
    - Diamond Operator
    - Raw Types (Object)

Generic Constructor / Method

- Class Type Parameter Referencing
- Local Type Parameter Referencing
- Type Parameter Scope
- Invocation
  - Type Witness Omission
  - Type Inference

Generic Interface

- Declaration
  - Header / Body Syntax
  - Interface Type Parameters
  - Local Type Parameters
  - Extension and Type Pass Up
    - Aggregation, Override and Overload
    - Multiple Inheritance
    - Generic / Non-Generic Inheritance
    - Non-Ambiguity
  - Interface Consolidation
    - Multiple Inheritance / Extension / Implementation
- Class Implementation
  - Class Header / Body Syntax
  - Multiple Interface Consolidation
  - Non-Ambiguity
  - Type Argument Specification
    - Generic Type
    - Hardcode
    - Object

Type Arguments

- Bounding
  - Wildcards
  - Upper
  - Lower
  - Unbounded
- Restrictions
- Compatibility
- Extension Substituition

Restrictions

- No Primitive Types
- No Instantiation
- No Static Fields
- No Arrays
- No Overloading (ambiguity)
- No Relational Operators
- No Casting (unless valid)

Type Parameters

- Bounding
  - Upper
  - Unbounded
  - Minimum Implementation
  - Multiple Bounds
- Restrictions
  - Erasure
  - Type Naming Convention

Collections

Interface

- Collection
- List
- Set
- Comparable
- Comparator
- Iterator
- ListIterator
- Map
- Queue
- Deque

Class

- ArrayList
- LinkedList
- HashSet
- LinkedHashSet
- TreeSet
- HashMap
- LinkedHashMap
- TreeMap
- ArrayDeque

- Overview / Benefits
- Interface Properties / Characteristics
- Modifiable / Unmodifiable
- Mutable / Unmutable
- Optional / Unsupported Methods
- View Collection
- Serializability
- Restrictions
- Optional / Unsupported Methods
- View Collection
- Traversal
  - Streams / Pipelines
  - For-Each / Iterators
- Bulk Operations
- Conversions
  - Collection / Array
  - Conversion Constructors

Design Patterns

- Abstract Factory
- Adapter
- Bridge
- Builder
- Ch. Responsibility
- Command
- Composite
- Decorator
- Facade
- Factory Method
- Flyweight
- Interpreter
- Iterator
- Mediator
- Memento
- Observer
- Prototype
- Proxy
- Singleton
- State
- Strategy
- Template Method
- Visitor

Techniques and Data Structures

Dynamic Programming

- 1D
- 2D
- Top-Down
- Bottom-Up / Tabulation

- Divide and Conquer
- Greedy
- Backtracking
- Path / Level Tracking
- Sliding / Dynamic Window
- Binary Search
- Big O (Time / Space)

- Linked List
- Stack
- Queue
- Deque
- Heap
  - Min Heap
  - Max Heap
  - Priority Queue
- Hash Table / Map
- Prefix Array
- Suffix Array
- Disjoint Set / Union Find

Recursion

- Recursive Method Structure
- Preprocessing
- Postprocessing
- Base / Ongoing Case
- Call Tree
- Tail Recursion

Graphs / Trees

- Binary Tree
- Binary Search Tree
- Balanced Binary Search Tree
- Minimum Spanning Tree
- n-ary Tree
- Trie

Graph / Tree Traversal

- Directed
- Undirected
- Acyclic
- Edge List
- Adjacency List
- BFS / DFS
- preOrder
- inOrder
- postOrder

Multithreading / Concurrency

Interface

- Runnable
- Callable
- Future
- Lock
- Condition
- ExecutorService
  - SingleThreadExecutor
  - FixedThreadPool
- ScheduledExecutorService
  - ScheduledThreadPool
- BlockingQueue<E>
- ConcurrentMap<K,V>

Class

- Thread
- ReentrantLocks
- Semaphore
- Executors
- CountDownLatch
- CyclicBarrier
- AtomicInteger
- ConcurrentHashMap<K,V>
- Exchanger<V>
- PriorityBlockingQueue<E>
- PriorityBlockingQueue<E> with Comparable Element

Techniques

- Synchronisation Blocks
- Wait / Notify
- Volatile Memory
- Object Locks
- Object Locks with Conditions
- Producer / Consumer

Fork / Join

- Class
  - ForkJoinPool
  - RecursiveAction
  - RecursiveTask<V>
- Sequential v Parallel (via Fork / Join)
  - Find Max
  - Mergesort

Serial v Parallel

- Mergesort
- Find Sum
- Streams

States

- Livelock
- Deadlock

Packages

- Management / Organisation
- Naming Conventions
- Referencing
- Importing Static Members
- Import Wildcards
- Importing Top Level Components

SOLID Principles

- Single Responsibility
- Open-Closed
- Liskov Substitution
- Interface Segregation
- Dependency Inversion

Infrastructure

- JDK
  - SE: Standard Edition
  - EE: Enterprise Edition
  - ME: Micro Edition
- JRE / JVM
  - JIT Compiler
    - CLASSPATH
    - Source Directory
    - Java API Library
  - Class Loaders
    - Bootstrap
    - Extension
    - System / Application
  - Memory Allocation
    - Heap
    - Stack
    - Program Counter

Miscellaneous

- final
- null
- super
- this
- instanceOf
- .equals()
- .hashCode()
  - Constructor Chaining
  - Local Reference
  - Method Argument / Return
- Statements / Expressions / Blocks
  - Composition
  - Types
  - Hierachy
  - Concatenation
- Composition v Aggregation

Spring

Projects
- Spring Boot
- Spring MVC
- Spring Validation
- Spring Data
- Spring Batch / Integration
- Spring Security
- Spring Security For OAuth
- Spring Security Authorisation Server

Bean Declaration / Definition
- via XML
- via Annotation
- via Bean Method (@Bean)
- via Component Scanning (@Component)
- via Configuration Classes (@Configuration)

Dependency / Bean Injection
- via Constructor
- via Setter
- via Field
- via Autowiring

Spring MVC Web Application / REST Endpoint
- Embedded Tomcat Server
- Thymeleaf Templates

- @Controller
- @RestController
  - @RequestMapping
  - @GetMapping
  - @PostMapping
  - @PutMapping
  - @DeleteMapping
  - @PatchMapping
  - @SessionAttributes
  - @ModelAttribute

  - RestTemplate
  - ResponseEntity
  - Object Mapping
  - JSON / XML Payload
  - Pagination
  - Cross Origin Resource Sharing
  - Path Variables
  - HATEOAS
  - @ResponseBody
  - @ResponseStatus

Testing
- @SpringBootTest
- @WebMVCTest
- @Test

Dev Tools
- Auto Restart
- Auto Refresh
- No Caching
- H2 Console

Spring Initializr
- Project Creation / Structure
  - Source Code
  - Resources
  - Test
  - application.properties
  - application.yml
  - Manifest File
  - Executable *.jar / *.war
  - Mavern / Gradle Build
- Starter Dependency Selection

Spring Tool Suite
- IDE Plugin
- Spring Boot Dashboard

Configuration
- DSL Configuration
- Configuration Properties
- Profiles

Lombok
- @Data (Data Class)
- Getter / Setter Auto Populate

Logging
- @Slf4j
- Logback

Persistence
- Spring Data JDBC/JPA/...
- JDBCTemplate
- Schema (via *.sql)
- SpEL
- @Repository
- @Table
- @Data
- @Id
- @Query

Security
- User Authentication
- Security Filter Chains
- 3rd Party Authentication
- OAuth2
- JWT
- OpenIDConnect
- Cross Site Request Forgery
- Client Repositories

Messaging
- Asynchronous Brokers
  - JMS
  - RabbitMQ
  - Kafka
  - JMSTemplate
  - RabbitMQTemplate
  - KafkaTemplate
- Push / Pull Models
- Message Converters
- Message Header / Payload
- Message Listeners

XML HTTP REST

XML
- Purpose
- Standards
- XML Document
  - Prologue
  - Elements
    - Tags
    - Attributes
    - Root
    - Siblings
    - Entity Reference
  - Well Formed
  - Comments
  - Namespaces
- XMLHttpRequest
- XML Parser
- XML DOM
- XPath
- XSLT
- XQuery
- XLink
- XPointer
- DTD / XML Schema

HTTP
- Purpose
- Properties
  - Connectionless
  - Media Independent
  - Stateless
  - Versions

MIME Type
- Format
- Components
  - Type
  - Tree / Subtype
  - Suffix
  - Parameters
  - Registration Trees
  - Standards Tree
  - Vendor / Producer Tree
  - Personal / Vanity Tree
  - Unregistered Tree

REST API
- Purpose
- Client / Server
- Stateless
- Uniform Interface
  - Resource Identification: URI
  - Resource Manipulation: GET, PUT, POST, DELETE...
  - Resource Description: Content-Type: application/json

Workflows / Build Tools

Continuous Integration > Continuous Delivery / Deployment
- Low Risk
- Progress
- Automation
- User Feedback

Test Automation
- Unit Test Suite
- Regression Test Suite
- Performance Test Suite

DevOps
- Purpose
- Advantages
- Pipeline
  - Idea > Code > Build > Deploy > Manage > Learn > Idea...
  - Velocity
  - Quality
- Value Stream Map

Scrum

- Purpose
- Team / Roles
  - Product Owner
  - Scrum Master
  - Developers
- Sprint Events / Workflow
  - Plan
  - Development
  - Review
  - Retrospective
- Artifacts
  - Product Goal
  - Product Backlog
  - Increment (of Value)
- Sprint Backlog
  - Sprint Goal
  - Items
  - Plan of Delivery
  - Burndown Chart

Maven / Gradle

- Purpose
- Project Structure
  - *.pom / build.gradle
  - Modules
  - Dependencies
  - Plugins
    - Maven WAR
    - Maven Cargo
- Build Lifecycle
- mvnrepository.com
- Goals / Tasks

TDD

- Cycle: Red > Green > Refactor > Red...
- Unit Tests
  - Solution Space
  - Output Space
  - Constraint
  - Certainty / Flexibility
  - Uncertainty Principle
  - Value / Property Testing
- Test Patterns
  - Self Shunt
  - Humble Object
- Test Doubles
  - Dummy
  - Stub
  - Spy
  - Mock
  - Fake

Git / GitHub

Version Control

- VCS Version Control Systems
- CVCS Centralised Version Control Systems
- DVCS Distributed Version Control Systems
- DBVC Delta Based Version Control

Repository

- Local / Remote
- Clone
- .git Folder
- .gitignore
- Patch/Patch Set
- Staging Area
- Diff
- Directed Acyclic Graph
- git Configuration
  - Global
  - User
  - Repo
- File Status
  - Untracked / Ignored
  - Tracked
  - Modified
  - Staged
  - Staged + Modified
- Working Directory
  - Clean/Dirty
  - Stashing
- Revision
- History
  - Search Metadata
  - Reflog
- Submodules
- Pull Requests

Commits

- Snapshot
- Patch + Metadata
- Hash ID (Raw Reference/Short Link)
- Granular / Clarity
- Best Practices / Considerations

- GitHub Desktop
- GitHub/Git CLI

Branching

- Main
- Feature
- HEAD
- Local Branching
- Remote Branching
- Creation
- Checkout
- Switching
- Renaming
- Show/Status
- Push / Pull
- Tracking
- Deletion
- Reset
- Merging
  - Fast Forward
  - Merge Commit
  - Conflict
  - Abort
- Compare
- Rebase
- Interactive Rebase
- Cherry-Picking
- Upstream / Downstream
- Best Practices / Considerations

Kotlin

Class

Declaration / Definition

- Constructors
  - Primary
  - Secondary
  - Init Block
- Properties
- Member Functions

- Extension
- Interface Implementation
- Delegation (by)
- Operator Overloading

Properties

- Backing Field
- get() set()
- value field
- Lazy
- lateinit
- val var
- Default value
- Delegation (by)

Data Class

- Purpose
- Creation
- Built-In Implementations
  - .toString()
  - .equals / ==
  - .hashCode()
  - .copy()
  - .println()
  - .component1()...
- Copying
- Destruction Declarations

Enum Class

Sealed Class

Nested / Inner Class

Generics

- Classes
- Interfaces
- Functions
- Extension Functions

Collections

- List Mutable / Read-Only
- Map Casting
- Set

Extension Functions

- .filter()
- .map()
- .mapNotNull()
- .any()
- .all()
- .none()

- .find()
- .first()
- .firstOrNull()
- .associate()
- .associateBy()

- .count()
- .partition()
- .groupBy()
- .groupingBy()
- .maxBy()
- .minBy()
- .flatten()
- .flatMap()

- .zip
- .zipWithNext()

- .getOrPut()
- .sortByDescending()

Extension Properties

- Creating
- Referencing
- Receiver (via this)
- Type Arguments / Parameters
- Bound / Unbounded
- Nullable / non-Nullable

Objects

- Purpose
- Singleton / static
- Object Expressions
- Declaration
- Referencing
- Companion

Language

- History
- Purpose
- Java / JVM Interoperability
- Java Interpretation
- Java Equivalents
- OOP / Functional Styling
- Statically Typed
- Concision
- Modules / Packages
- Top Level
- equals() / == / ===
- Constants
- Pairs
- Inlining
- Arrays

Access Modifiers

- private
- protected
- internal
- public

Loops

- in
- until
- downTo
- step
- Range
- ..

Types

- Type Inference
- is / as / as?
- .let()
- Type Casting
- Smart Casting
- ?
- Unit / Nothing
- val / var
- Any

Conditionals

- Expressions
- Comparisons
- when
  - if-else chain
  - Type Checking
  - Ranges
  - Enum
  - Pairs

Strings

- Templates
- Multiline
- Data Type Conversion
- Concatenation

Common Library Functions

- .takeIf()
- .takeUnless()
- .repeat()
- .use()
- .with() / .run()
- .withLock()
- .apply() / .also()

Nullable / non-Nullable

- Purpose
- Safe Call
- Elvis Operator
- non-Null Assertion !!

Java / Kotlin Interoperatbility

- via Annotation
- via Explicit Type Specification
- via Intrinsic Checks
- NPE Safety
- Platform Types

Exceptions

- Structure / Form / @Throws
- try catch
- Assignable
- Function Wrappers
- .require()

Common Annontations

- @JvmName
- @JvmOverloads
- @JvmStatic
- @JvmField

Functions

- Top-Level
- Member
- Anonymous
- Local
- Extending
- Overriding

Forms

- As Variable
- As Parameter
- As Return
- Named Parameters
- Default Arguments
- Function Expressions

Function Types

- Implicit / Explicit
- nullable / non-nullable

Member References

- Bound / Unbound

Extension Functions

- Purpose
- Creating
- Managing
- Limitations
- Invocation from Java
- infix

Sequences

- Purpose
- Stream Equivalent
- Collection Alternative

- Intermediate Operations
- Terminal Operations

- Lazy
- Yield

- .asSequence()
- .generateSequence()

Lambda Expressions

- Purpose
- Structure { }
- Chained Statements (Functional Styling)
- Trailing Lambda
- Destruction Declaration
- .run()

Forms

- As Variable
- As Argument
- As Return
- As Run / Invocation

Return Control

- via Labelling
- Whole Function

Parameters

- None
- Blanked _
- Single / it
- Multiple

Lambda (with Receiver)

- Purpose
- Structure / Difference
- Extension Function / this

Android

Android Studio

Project Structure / Files

- Source Code
- Resources
- Libraries
- Gradle
- Manifest File
- APK file

UI / Layouts

- Code Editor
- Design Editor

Emulation

- USB Direct
- AVD

UI

- Layout XML
- LinearLayout
- FrameLayout
- ScrollView
- Padding/Margin
- Weighting
- Gravity
- Themes
- AppBar
- Toolbar
- Composable
- CoordinatorLayout
- AppBarLayout
- CollapsingToolbarLayout
- Bluprints
- Layout Inflation
- Layout Nesting
- Collapsing Toolbar
- Scrolling Toolbar
- Material Design
- ConstraintLayout
  - Constraints
  - Bias
  - Guidelines
  - Barriers
  - Chains
  - Flows
- Navigation Bar
- Navigation Drawer

Architectures

- MVC
- MVI
- MVVM
- MPC

Views

- TextView
- Button
- Checkbox
- Chip/Groups
- Spinner
- View Binding
- View Models
- View Model Factories
- View Model Provider
- Intents
- Broadcasts
- Services
- Work Manager
- Radio Button/Groups
- Floating Action Button
- Toast
- Snackbars
- View Groups
- Compose
- Live Data
- Mutable Live Data
- Data Binding

Activity

- Lifecycle State / Methods
- Lifecycle (Visibility)
- Lifecycle (Foreground)
- Save / Restore State
- Bundle
- Device Rotation

Multiscreen

- Fragments
- Fragment Lifecycle
- Navigation Component
- Navigation Graphs
- Navigation Host
- Navigation Controller
- FragmentContainerView
- Actions
- Safe Args / Directions / Args
- Back Stack

Cloud

Architectures

Monolith

- Advantages
- Disadvantages

Microservices

- Advantages
- Disadvantages
- Characteristics
- Inter-Communication
  - Request / Response
  - Event Driven
    - Event Messaging
    - Event Streaming
- Design Patterns
  - Backend-for-frontend (BFF)
  - Entity and Aggregate
  - Service Discovery
  - Adapter
- Design Anti-Patterns

Serverless

- Advantages
- Disadvantages
- Abstraction Chain

Compute Models

- On-Prem
- IaaS
- PaaS
- FaaS
- SaaS

Cloud Service Providers

- Amazon
  - AWS
  - AWS Elastic Beanstalk
  - AWS Lambda
- Microsoft
  - Azure
  - Microsoft Windows Azure
  - Azure Functions
- Google
  - Google Cloud / GCP
  - Google App Engine
  - Google Cloud Functions
- IBM
  - IBM Cloud
  - IBM Cloud Code Engine
- Oracle
- Heroku
- VMWare

Kubernetes

Cluster

- Control Plane
  - cloud-controller-manager
  - kube-controller-manager
  - kube-apiserver
  - kube-scheduler
  - etcd
- Node(s)
  - kubelet
  - k-proxy
  - Container Runtime
    - Docker Engine
    - CRI-O
    - Containerd
    - Mirantis Container Runtime
  - Objects
    - Configuration: *.yml
    - Pod
    - Deployment
      - Pod Template
    - StatefulSet
    - ReplicaController
    - Volume
    - PersistentVolume
    - PersistentVolumeClaim
    - Secret
    - Service
      - ClusterIP
      - NodePort
      - Load Balancer
      - Ingress
  - Label Selector System
  - Environment Variables
  - Role Based Access Control

Cluster Admistration:

- kubectl
- kubeadm
- minikube

Controller(s)

- Node Controller
- Job Controller
- Endpoints Controller
- Service Account Controller
- Token Controller

Cloud Integration

- CI / CD Workflow
  - Local > GitHub > Test Suite > DockerHub > Cloud Service Provider
- Travis CI
  - .travis.yml
- Cloud Service Provider
  - Configuration
  - Integration
  - Account Verification
  - Environment Variables
  - Logs / Monitoring
- Declarative / Imperative

Docker

Core

- docker-server
- docker-client
- docker-compose
- dockerHub

Container

- Resource Segmentation
- Start / Stop
- Status / Monitoring
- Communication Channels
- Environment Variables
- Logging / Exiting

Image Build		**Image**
DockerFile	docker-compose	File System
Base Image	docker-compose.yml	Startup Command
Dependencies	Build Context	
Startup Command	Build Cache	
Development	Networking	
Production	Port Mapping	
	Restart Policy	
	Volumes	

HTML / CSS / PHP / mySQL

nationalsyndicate.org.uk

- In 2004-2005 completed a substantial personal project of creating an online lottery syndicate.
- Users would join and create a subscription.
- Users would declare their desired ball combinations to be used as entries within the syndicate.
- All of the syndicate entries would be bulk purchased securely and electronically for each draw.
- The excitement and appeal would be generated by being part of a syndicate of potentially thousands, if not hundreds of thousands of entries.
- Built using HTML / CSS / PHP / mySQL and PayPal.
- Front and backend fully operational.
- Unfortunately it did not go live due to Camelot not willing to provide support for secure electronic bulk ticket purchasing.
- Nonetheless it provided a significant and enjoyable learning experience.

Research Materials

Please find a summary of the primary resource materials used for the research and study of the subject areas listed above:

Primary Online Resources

Java SE	Oracle Java Tutorials	https://docs.oracle.com/javase/tutorial/index.html
	Oracle Java API	https://docs.oracle.com/javase/8/docs/api/index.html
Spring	Online Documentation	https://docs.spring.io/spring-framework/docs/current/reference/
Kotlin	Online Documentation	https://kotlinlang.org/docs/home.html

Udemy Courses

Java Programming Masterclass
Design Patterns in Java
Concurrency, Multithreading and Parallel Computing in Java
Java Memory Management
Java Application Performance and Memory Management
Java Reflection
Java Spring Tutorial Masterclass – Spring Framework 5
Dynamic Programming and Data Structures
Test Driven Development
The Complete Oracle SQL Bootcamp

Coursera Courses

Kotlin for Java Developers by JetBrains

W3Schools

XML Tutorial

LeetCode

Data Structures and Algorithms
Dynamic Programming
Bit Manipulation
150+ Questions Completed

Bibliography

Java The Complete Reference	8th Ed.	Herbert Shildt	Oracle Press
Java Cookbook	4th Ed.	Ian F Darwin	O'Reilly
Spring in Action	6th Ed.	Craig Walls	Manning
Cloud Native Java	1st Ed.	Josh Long and Kenny Bastani	O'Reilly
Pro Git	2nd Ed.	S.Chacon B.Straub	Apress
Design Patterns	1st Ed.	E.Gamma R.Helm R.Johnson J.Vlissides	Addison Wesley
Clean Architecture	1st Ed.	R.C.Martin	Prentice Hall
Clean Craftsmanship	1st Ed.	R.C.Martin	Prentice Hall
The Clean Coder	1st Ed.	R.C.Martin	Prentice Hall