	Backend Təlim-tədris proqramı					
Təlim-tədris günü	Mövzunun adı	Mövzu üzrə istifadə və istinad olunan vəsaitlər (ədəbiyyat siyahısı)	Nəzəri məşğələlərin saat həcmi	Parktiki məşğələlərin saat həcmi	Məsləhət saatının həcmi	İmtahan saatının həcmi
1	Introduction to Programming ; Introduction to programming; Algorithmic thinking, Reasoning; Flowcharts, Pseudo-codes; Console and Desktop Applications; Environment setup; Introduction to IDE editor and tools; Introduction to execution of java programs; Java compiler. JIT, JVM, JRE, JDK ; javac vs. java commands. ; java vs .class extensions. ;Writing Simple Hello World java program. ; Main entry point and command line arguments.;Main shell commands for compiling and running.;Java syntax	https://www.geeksforgeeks.org/	2	2	1	0
2	Language Elements ; Comments, Variables and Data types; How memory works for the variables of primitive data type. Final variables.; Expressions and statements.; What are operators.; How many types of operators are there in java ; Unary Operator, Arithmetic Operator, Shift Operator, Relational Operator ; Bitwise Operator, Logical Operator, Ternary Operator and Assignment Operator ; Input and output process in Java. ; What is Input and Output. ; Input types (Scanner), output formats.	https://www.geeksforgeeks.org/	2	2		0
3	Practice Day			4	1	0
4	Conditions ; if/else operator; switch/case operator ; ternary if operator ; Using binary operators and Boolean data types	https://www.geeksforgeeks.org/	2	2		0
5	Repetitions ; Introduction to loops; While loop ; do/while loop ; for loops.; break, continue	https://www.geeksforgeeks.org/	2	2		0
6	Practice Day			4	1	o
7	Array ; Declaration, instantiation, initialization of arrays ; How memory works for arrays. ; Single dimensional.; Iterating through an array. For-each statement.	https://www.geeksforgeeks.org/	2	2	1	0
8	Introduction to Object Oriented Programming Classes vs Objects ;Primitive vs Reference data type; How memory works for reference data types; Garbage collection.; Methods in Java Types of methods. ;Defining and calling methods, void keyword	https://www.geeksforgeeks.org/	2	2		0
9	Practice Day			4	1	0
10	Introduction to Object Oriented Programming ; Constructors; Static and instance methods; Method overloading; Object initialization; Pass-by-value vs pass-by-reference ;Sending and returning arrays to/from a method	https://www.geeksforgeeks.org/	2	2		0
11	OOP Principles ;Encapsulation; Inheritance ;Method overriding	https://www.geeksforgeeks.org/	2	2		0

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12	Practice Day			4	1	1
13	OOP Principles (continues) ; Polymorphism; Abstraction; "instanceof" keyword	https://www.geeksforgeeks.org/	2	2	1	0
14	Interfaces; Interfaces and implementing methods; Default and static interface methods ; Design Patterns. Singleton pattern, builder pattern, factory pattern ;In-class quiz	https://www.geeksforgeeks.org/	2	2	0	0
15	Practice Day			4	1	0
16	In Class Quiz					2
17	Packages ;Packaging. Built-in packages ; Importing packages. Single class imports ; Static imports, Whole package imports (using wildcards) ; User defined packages. ; Final methods, final classes, polymorphism, abstract methods ; UML Diagrams for class designing ; Encapsulation (different packages: default vs protected)	https://www.geeksforgeeks.org/	2	2	0	0
18	Enumerations and Wrapper types ; Enumerations ; Methods, calling other methods and passing variables ; local variables, formal parameters ; Passing by value. ;Wrapper alternatives of primitive types like Integer, Long etc...; Var keyword	https://www.geeksforgeeks.org/	2	2	0	0
19	Practice Day			4	1	1
20	Exceptions in Java; Exception hierarchy; checked vs unchecked exceptions; Compile-time vs run-time ; Errors, Handling exceptions; try, catch, finally blocks; Multiple catch vs union catch; throws statement; Try-with-resources; Throwing new exceptions; Custom exceptions ; Swallowing exceptions	https://www.geeksforgeeks.org/	2	2	1	0
21	Date and Time API & Multidimensional Arrays ; LocalDate, LocalDateTime ; LocalTime ; Instance ; Period ; ChronoUnit ; Multidimensional and jagged arrays. ; Array Copy and Array Clone. ; Finding maximum/minimum of an array.; Sorting arrays. ; Introduction to data structures and algorithms: Bubble sort, linearsearch, selection sort, binary search.	https://www.geeksforgeeks.org/	2	2	0	0
22	Practice Day			4	1	0
23	Generics ; Need for generics, Type wildcards ; Diamond operator ; Generic class definitions ; Generic method definitions	https://www.geeksforgeeks.org/	2	2		0
24	Sorting and Comparing ; Sorting collections. ; Comparator, Comparable class. ; Properties class. ; Reading properties from external files.	https://www.geeksforgeeks.org/	2	2		0
25	Practice Day			4	1	0

26	Collections; Intro to java collection framework ; Data structures: ArrayList, LinkedList, Map, Set, Vector, Stack, Queue. ; Ready JDK implementations. ; List interface and its classes,set interface and its classes ; Map interface and its classes	https://www.geeksforgeeks.org/	2	2	1	0
27	Collection Implementations; Set vs List. ; LinkedHashSet, TreeSet ; PriorityQueue ; EnumSet class, EnumMap class ; Collections class, Arrays class	https://www.geeksforgeeks.org/	2	2		0
28	Practice Day			4	0	1
29	Input Output Streams & Reading and Writing Files ; Standard Streams ; Input, Output and Error ; Byte and Character IO Streams ; Several Byte Stream classes ; Several Character Stream classes ; Files and IO ; FileReader and FileWriter ; File navigations ; Buffered byte and character streams	https://www.geeksforgeeks.org/	2	2		0
30	Serialization, Reflection; Serialization, Object Streams ; Transient keyword; Binary vs XML vs JSON serialization ; Introduction to Reflection API ; Java Class object, Fields, Methods and Constructors ; Private vs public modifiers ; Accessing inherited fields and methods ; Dynamic invocation, Annotations, Arrays, Generics	https://www.geeksforgeeks.org/	2	2		0
31	Practice Day			4	1	0
32	Multithreading ; Multithreading, Process vs Thread vs Task ; Thread class and Runnable interface ; Lifecycle of a thread, Synchronization ; In-class quiz	https://www.geeksforgeeks.org/	2	2	1	0
33	In Class Quiz					2
34	Execution Service ; Execution service ; Concurrency ; Atomic scalars ; JoinFork	https://www.geeksforgeeks.org/	2	2		0
35	Practice Day			4	1	0
36	Data Structures and Algorithms. Lambda. Stream API ; Intro to DSA ; Complexity analysis ; Big Oh notation ; Functional interface ; Lambda expressions. ; Java Stream API and lambda expressions to search collections	https://www.geeksforgeeks.org/	2	2		0

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37	Midderm Exam			2		2
38	Database Fundamentals ; Introduction to RDBMS, SQL commands ; DML, DDL, TCL, DCL ; Writing SQL Statements ; Adding a New Row to a Table ; The INSERT Statement Syntax 8-5 ; Inserting New Rows ; Creating various database objects, and viewing their list with special SELECT statements.	https://www.w3schools.com/sql/	2	2	0
39	Practice Day			4	1	0
40	Retrieving, Restricting, and Sorting Data ; Arithmetic Expressions and Operators ; Null Values in Arithmetic Expressions ; Defining a Column Alias, Concatenation ; Using Operators ; Literal Character Strings ; Duplicate Rows, Eliminating Duplicate Rows ; Limiting Rows Using a Selection ; Using the WHERE Clause ; Character Strings and Dates ; Using Comparison Conditions – BETWEEN, IN, LIKE ; Using Logical Conditions – AND, OR, NOT ; ORDER BY Clause ; Sorting by Column Alias, Multiple Columns ; GREATEST, LEAST, NULLIF, COALESCE, CASE/WHEN Functions ; Conditional Expressions - CASE and DECODE Function ; Using TO_CHAR, TO_NUMBER, TO_DATE, CAST, İNTERVAL Functions; Date Formatting ; Character Manipulation, Number, Round, Trunc, Mod, Conversion Functions	https://www.w3schools.com/sql/	2	2	1	0
41	Aggregating Data Using Group Functions. Subqueries Objectives ; What Are Group Functions? ; Types of Group Functions ; Group Functions Syntax ; Using the AVG and SUM Functions ; Using the MIN and MAX Functions ; Using a Subquery to Solve a Problem ; Subquery Syntax ; Using a Subquery ; Using SET Operators	https://www.w3schools.com/sql/	2	2		0
42	Practice Day			4	0	1
43	Constraints. Displaying Data from Multiple Tables ; Obtaining Data from Multiple Tables. ; Cartesian Products ; Generating a Cartesian Product ; Types of Joins ; Primary key, Foreign Key, Unique, Not Null, Check	https://www.w3schools.com/sql/	2	2		0
44	Java Database Connectivity ; JDBC API ; Java Database Drivers ; Connection to database ; Statement, Callable Statement, Prepared Statement ; Result Sets ; Auto commit	https://www.w3schools.com/sql/	2	2		0
45	Practice Day			4		
46	Midderm Exam			2		2

47	Introduction to Spring Boot Application ; Server-Side Rendering ; What is Web API ; HTTP protocol. Status Codes and HTTP Methods ; JSON and YAML formats ; IoC, DI ; Spring Initializr. start.spring.io ; Spring Framework Overview. ApplicationContext ; Spring Boot and Related Projects Overview ; Creating first Spring Application ; Build tools: Gradle, Maven ; Bean configuration types ; @Configuration, @Bean	https://www.baeldung.com/	2	2	1	0
48	Simple Spring Boot Application ; @SpringBootApplication annotation. Conventional projectstructure. ; @Controller, @RequestMapping, @GetMapping, @PostMapping and other request mapping annotations ; @RequestBody, @ResponseBody, @RestController ; @RequestHeader, @CookieValue ; HttpServletRequest, HttpServletResponse ; Handling query parameters from query string, path ; ResponseEntity ; @ResponseStatus ; Postman ; Saving submitted model data to a List and manipulating that list with various requests	https://www.baeldung.com/	2	2		0
49	Practice Day			4	1	0
50	In Class Quiz					2
51	Working with Services and Configuration ; Creating services and injecting with @Autowired ; Injecting with constructor and setters. ; application.properties, application.yaml files. ; Specifying environment variables in application properties ; Using @Value annotation. ; Specifying property values with ENV VARS and default values ; Overriding properties from CLI during java -jar command ; IN-class Quiz	https://www.baeldung.com/	2	2		0
52	Data Layer. JDBC Template. Profiles. Lombok ; @Repository. ; Injecting different implementations of the services based on the @Profile ; Specifying profiles in IDE and CLI ; JDBC Template. CRUD methods. ; Adding Lombok dependency. ; Using Lombok to create models easily ; Lombok annotations: @Data, @Getter @Setter annotation ; @Builder and other annotations ; No Argument Constructor ; All Argument Constructor	https://www.baeldung.com/	2	2		0
53	Practice Day			4	1	0
54	Logging. Swagger ; What is log? ; Log levels ; Simple Logging with LoggerFactory.getLogger() ; @Slf4j annotation and default logging features ; Logback: console, json ; Logging levels ; Logging format ; File Output ; Log Groups ; Logging properties and customization ; Profile specific logging ; What is OpenAPI Specification. ; Overview of Swagger and SpringFox libraries ; Adding swagger and SpringFox dependencies ; @Configuration annotation ; Basic Swagger Configuration ; Calling application methods through Swagger UI ; Changing default swagger URL ; Documenting models with swagger annotations ; server.servlet.context-path property	https://www.baeldung.com/	2	2		0
55	Rest Controller Advice. Multipart ; Throwing and Handling Exceptions ; @ExceptionHandler annotation ; Rest Controller Advice ; Adding necessary headers and HTTP statuses during exceptions ; Show exception messages in responses server.error.include-message=always server.error.include-stacktrace=never ; Uploading files ; Saving uploaded files ; Downloading files ; Uploading files with additional JSON models	https://www.baeldung.com/	2	2	1	0
56	Practice Day			4	1	0

#	Topic	URL				
57	Adding Database Support ; Spring Data Overview ; JPA and Hibernate Overview ; Adding Database Driver Dependencies ; Specifying Database Connectivity Parameters in properties file ; Creating @Entity models ; Creating @Repositories with CrudRepository and JpaRepository ; Injecting repositories into Service implementations ; Creating objects in database. Updating, Searching and Deleting ; @Table, @Column, @Id and @GeneratedValue annotations	https://www.baeldung.com/	2	2		0
58	More about Jpa ; @OneToOne relationship and its relationship ; @OneToMany annotation and its relationship ; @ManyToMany annotation and its relationships ; Custom Repository Functions ; @Queries with HQL ; Transactions ; Committing and Rolling Back	https://www.baeldung.com/	2	2		0
59	Practice Day		4	1		0
60	JPA Repositories Continued. MapStruct bean mappings ; @Native queries. Building complex queries ; @EntityGraph annotation. ; Hibernate related parameters in application.properties ; Connection Pools ; Mapper overview ; Adding dependencies ; @Mapper interface ; @Mapping interface ; Obtaining an instance of mapper at the service ; Testing Mappers	https://www.baeldung.com/	2	2		0
61	Database Structure Versioning • Liquibase ; Liquibase overview ; Adding Liquibase dependencies ; Liquibase and Lombok. Maven build plugins. ; Creating migration files to create tables ; Seeding data into tables ; Create master migration file and importing child versions ; Manually modifying existing migration file and troubleshooting database change version	https://www.baeldung.com/	2	2	1	0
62	Practice Day		4	1		0
63	Docker Containers ; Virtualization and containers ; Installing Docker ; Docker images and containers ; Pulling and running images ; Running commands inside docker containers ; Watching logs of containers ; Running PostgreSQL database from docker ; Running RabbitMQ and Redis images from docker ; Dockerfile overview ; Base images. ; Dockerfile commands. ; Adding files, executing commands ; Specifying entry point ; Build Spring Boot application docker image ; Run multiple Spring Boot images	https://www.baeldung.com/	2	2		0
64	Spring Validation ; Spring Validation overview. Spring Validation ; Adding dependencies to pom.xml ; @Min, @Max, @Size, @Email annotations ; @NotEmpty, @NotNull, @NotBlank annotations ; @Positive, @Negative, @Pattern and other annotations ; @Valid and @Validated annotations ; Custom validators ; Validating programmatically ; In-class Quiz	https://www.baeldung.com/	2	2		0
65	Practice Day		4	1		0
66	Internationalization, Static Files and Resources ; Serving static content ; Serving HTML, CSS, and images resources ; Locations ofstatic files ; i18n and message.properties ; LocaleResolver and LocaleChangeInterceptor	https://www.baeldung.com/	2	2	1	0

67	Spring Web - Thymeleaf ; Adding Thymeleaf dependency ; @Controller annotation and returning views ; Thymeleaf markup tags overview ; Passing model to Thymeleaf templates ; Building forms and handling POST data	https://www.baeldung.com/	2	2		0
68	Practice Day			4	0	1
69	Spring Security ; Authentication, Authorization ; JWT Generation ; Database Backed Users Service ; Security Configuration ; Enabling and Disabling Requests to certain paths ; Password Hashing ; Filters and Interceptors ; @CrossOrigin annotation ; Allowing Authentication Bearer header in Swagger	https://www.baeldung.com/	2	2		0
70	Spring Security Continued ; More about JWT. jwt.io ; Hashing algorithms. MD5, SHA1, SHA256 ; Signing and verifying signature. ; Cryptography. RSA, DES, AES and others ; X.509 certificates ; Nimbus library	https://www.baeldung.com/	2	2		0
71	Scheduled Jobs ; Scheduled Jobs overview. ; Creating jobs. ; @Scheduled annotation ; @EnableScheduling annotation ; fixedRate, fixedDelay and initialDelay parameters ; Using Cron Expressions	https://www.baeldung.com/	2	2	1	0
72	Practice Day			4	0	1
73	Making HTTP Calls to other systems ; Working with RestTemplate to retrieve various resources ; Feign Client ; Using various HTTP Methods to retrieve text, objects and binary data ; Specifying headers ; Configuring Timeouts ; JSON serialization and deserialization	https://www.baeldung.com/	2	2		0
74	SOAP Web Services ; Creating SOAP Web Services with Spring ; JAX-WS SOAP Web Service Client ; Contract first/last services ; WSDL, XSD definitions ; JAXB XML serialization and deserialization ; Reading and Writing XML Documents	https://www.baeldung.com/	2	2		0

75	Practice Day			4	1	0
76	Microservices Architecture; Overview of Microservices ; Monolith vs Microservices ; Microservices Patterns ; Avoid Binary Dependency ; Docker-compose multiple microservices	https://www.baeldung.com/	2	2	1	0
77	More about Microservices ; API Gateway ; Database per Service pattern ; SAGA pattern ; Circuit Breaker pattern ; Sidecar pattern ; Service mesh ; Health checks	https://www.baeldung.com/	2	2		0
78	Practice Day			4	0	1
79	In Class Quiz					2
80	Testing Microservices ; Unit testing ; Integration Testing: i. Consumer-driven contract test ii. End-to-end testing iii. Mocking ; Building integration test with a @Service implementation that is mocking functionality when launched with special @Profile	https://www.baeldung.com/	2	2	0	0
81	Git Version Control System ; Overview about version controlsystems ; Branches, Commits, Releases ; Initializing or cloning a repository ; Listing branches ; Git status ; Adding changes ; Commit-in changes ; Pushing, pulling, fetching ; Working with branches ; Merging branches ; Git servers. Gitlab, Github, Bitbucket ; Resolving conflicts ; Rebasing	https://git-scm.com/doc	2	2	0	0
82	Practice Day			4	1	0

83	Continuous Integration and Continuous Delivery ; Overview of CI/CD ; What is pipeline ; Run Gitlab server from docker image ; Register runners ; Gitlab pipeline example. ; Specifying pipeline variables ; Overview of Jenkins, Github Actions and CircleCI.	https://www.baeldung.com/	2	2	1	0
84	Deploying Microservices to Kubernetes ; Overview of Kubernetes ; Setting up Minikube. ; Nodes, Pods, Deployments ; Replication Controller, ReplicaSets ; Deploying to Kubernetes	https://kubernetes.io/	2	2	0	0
85	Practice Day			4	0	1
86	Accesing Microservices inside of Kubernetes ; Exposing deployments with Services ; Service Types: NodePort, LoadBalancer and ClusterIP ; Ingress Controller and Ingress Resources ; HAProxy configuration for routing resources to ingress controller ; Health checks. Readiness and Liveness probes ; Adding Kubernetes support to CI/CD	https://kubernetes.io/	2	2	0	0
87	Practice Day			4	0	1
88	Monitoring Microservices and Log Collection ; Monitoring overview ; Prometheus and Grafana ; Collecting metrics with Spring ; Collecting logs from containers with Loki ; Building dashboards and alarms	https://kubernetes.io/	2	2	1	0
89	Project Meeting			2	2	0
90	Demoday			4	0	0
CƏMİ			110	222	34	21

Müəssisənin adı və təşkilati hüquqi forması	ATL Akademiya MMC
Peşə/ixtisasın adı	Backend developer
Təlim-tədris müddəti (ay ilə)	4.5 ay
Təlim-tədris proqramının həcmi (saat ilə)	387
Təlim-tədris proqramının həcmi (gün ilə)	90

Təlim-tədris nəticələrinə görə müdavim bilməlidir	Java dilini sıfırdan öyrənmək, davamında isə databaza ilə işləmək, Spring Boot, Docker, Microservices arxitekturalarına və Kubernetes-ə giriş kimi ən yeni texnologiyaları öyrənmək.
Təlim-tədris nəticələrinə görə müdavim bacarmalıdır	Proqramın sonunda Java dilini və obyekt yönümlü proqramlaşdırmanı, problemlərin həlli üçün uyğun data struktur və alqoritmləri müəyyən etməyi, Spring Boot ilə veb tətbiqləri qurmağı, PL/SQL databazası ilə məlumatların saxlanması və istifadə edilməsini öyrənəcəksiniz. Bundan əlavə, Mikroservis texnologiyası ilə müxtəlif proqramlaşdırma dillərinin və texnologiyalarının eyni layihədə istifadə olunmasını, Docker ilə işləməyi, Kubernetes ilə bir və ya daha çox serverdə konteynerləri icra və idarə etmək.

Tarix: 05.08.2023   _____

Təlimçinin (və ya təlimçilərin) soyadı, adı, ata adı   Ülvi Ağacanov Nəriman oğlu

İmza:

Müəssisə rəhbərinin soyadı, adı, ata adı   Aydan Haşımova Aydın

İmza: