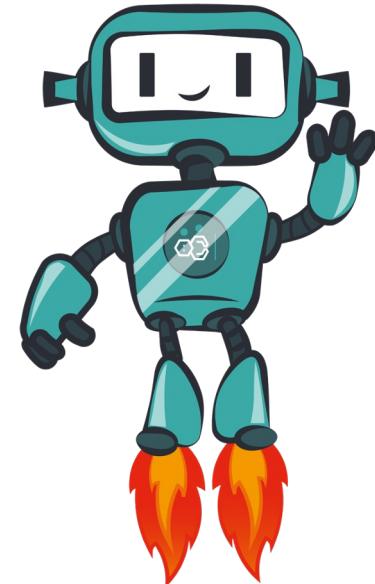


Višejezične API biblioteke za SaaS

Aleksandar Sabo
Developer Advocate @ RavenDB



Aleksandar Sabo



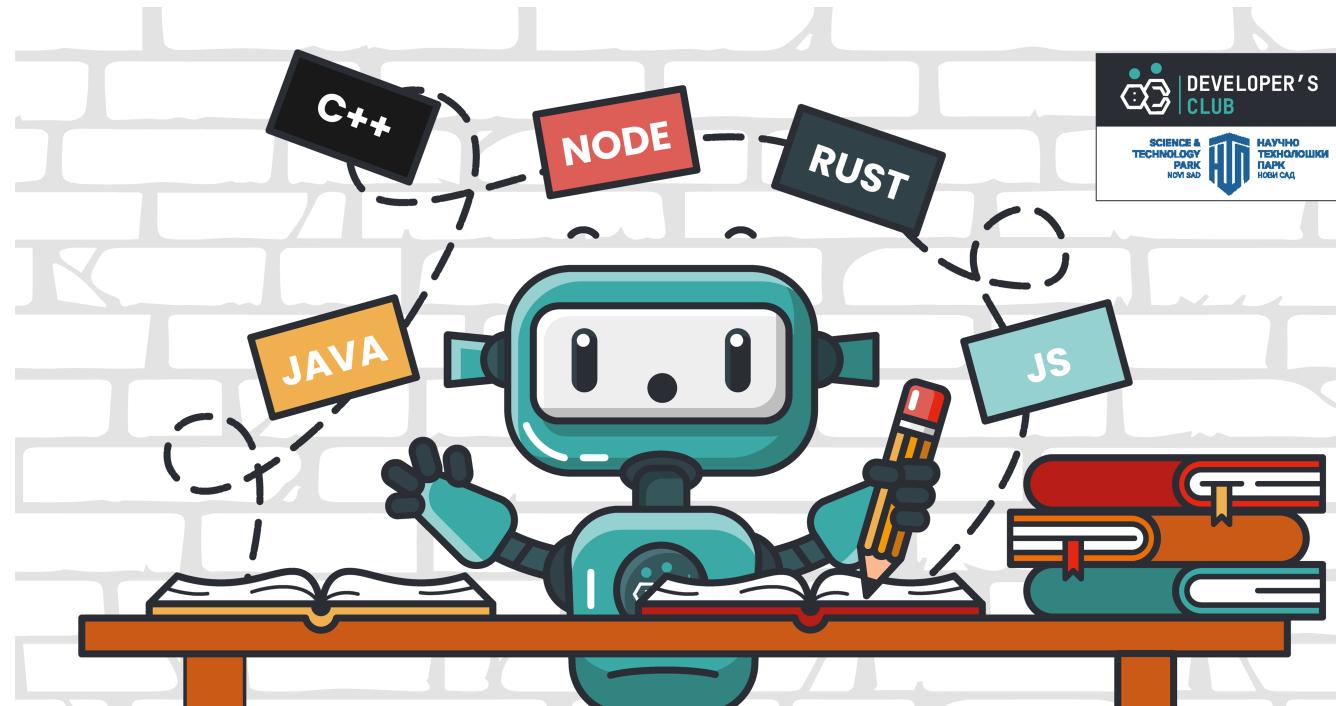
- Software Craftsman
- Developer Advocate @ RavenDB
- Developer's Club



Višejezične API biblioteke



kao podrška SaaS proizvodu



Višejezične API biblioteke



kao podrška SaaS proizvodu

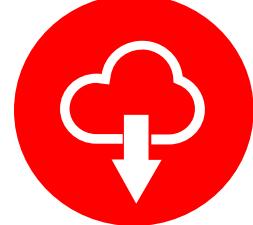


SaaS

Višejezične API biblioteke

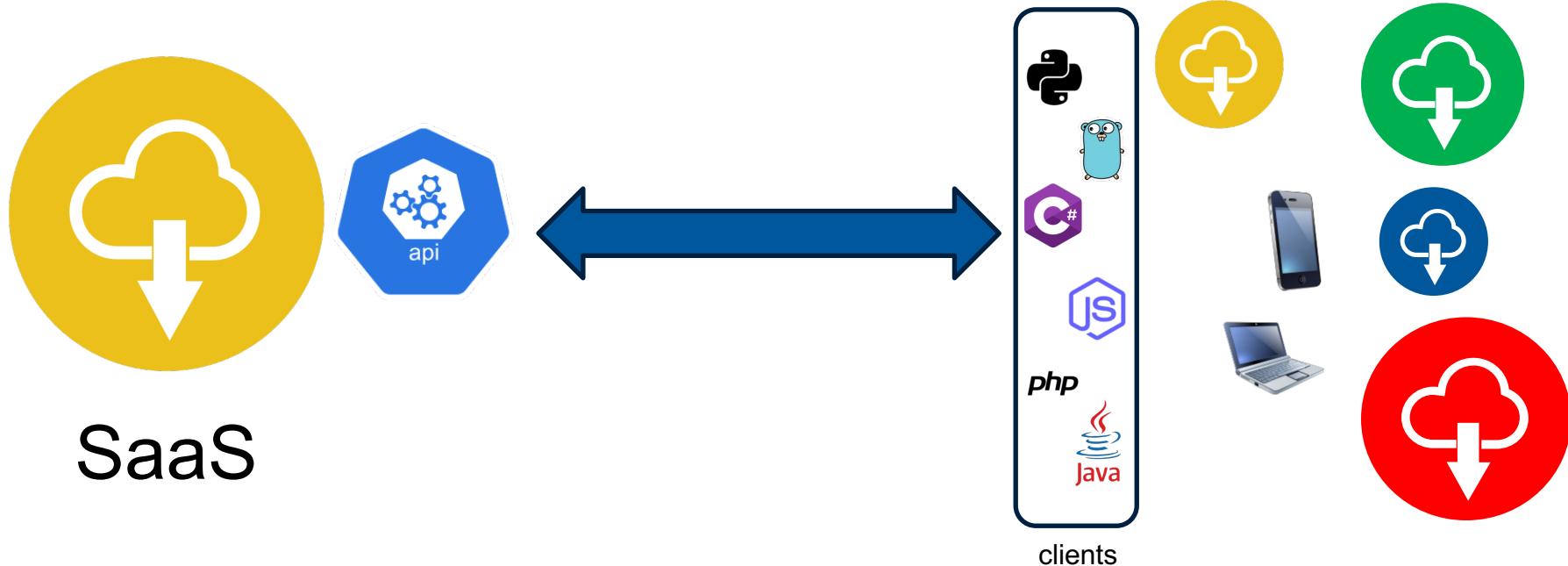


kao podrška SaaS proizvodu



Višejezične API biblioteke

kao podrška SaaS proizvodu

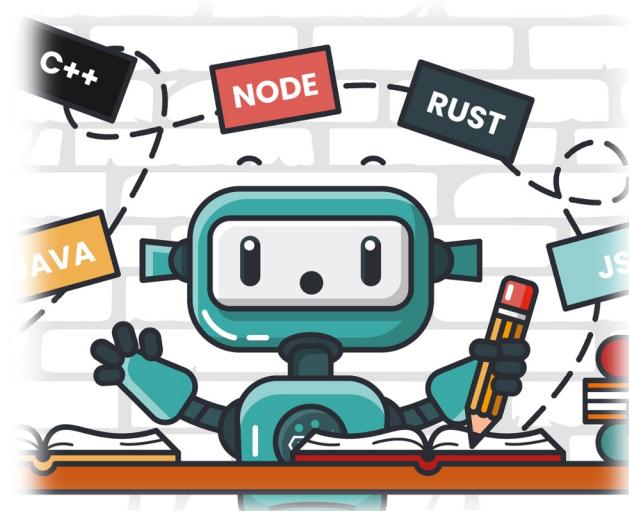


Višejezične API biblioteke

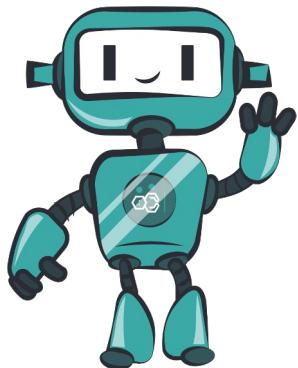
kao podrška SaaS proizvodu



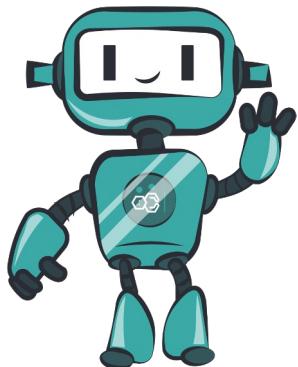
Strategije za development



Može li se koristiti
gotov generator
API klijenata?



**Mogu li se iz jednog
koda generisati
biblioteke za različite
programske jezike
(i/ili platforme)?**



Problemi generisanja biblioteka

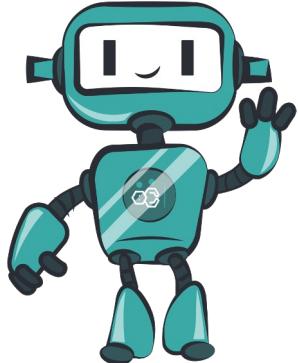


Smanjivanje stepena sigurnosti uvođenjem novog elementa u sistem

Ovi generatori koda često imaju podršku samo za ograničeni set programskih jezika

Često su to OS tools sa malim zajednicama

DEFINIŠI PRAVILA IGRE



Readability vs performance



pravila igre

https://github.com/id-Software/Quake-III-Arena/blob/master/code/game/q_math.c

20 captures float q_rsqrt(float number)

29 Jul 2017 - 27 Mar 2024

Go JUN JUL NOV
◀ 29 ▶ 2016 2017 2020 ▾ About this cap

```
552 float Q_rsqrt( float number )
553 {
554     long i;
555     float x2, y;
556     const float threehalves = 1.5F;
557
558     x2 = number * 0.5F;
559     y = number;
560     i = * ( long * ) &y;                                // evil floating point bit level hacking
561     i = 0x5f3759df - ( i >> 1 );                  // what the fuck?
562     y = * ( float * ) &i;
563     y = y * ( threehalves - ( x2 * y * y ) ); // 1st iteration
564 //     y = y * ( threehalves - ( x2 * y * y ) ); // 2nd iteration, this can be removed
565
566 #ifndef Q3_VM
567 #ifdef __linux__
568     assert( !isnan(y) ); // bk010122 - FPE?
569 #endif
570 #endif
571     return y;
572 }
```

to CQS or not CQS



pravila igre

The screenshot shows a code editor window for a file named `GetDocumentsCommand.php`. The code is part of a class definition:

```
class GetDocumentsCommand {
    /**
     * @param array $parameters
     * @return array
     */
    public function execute(array $parameters): array {
        $rdb = RavenDB::Instance();
        $documents = $rdb->GetDocuments($parameters);
        return $documents;
    }

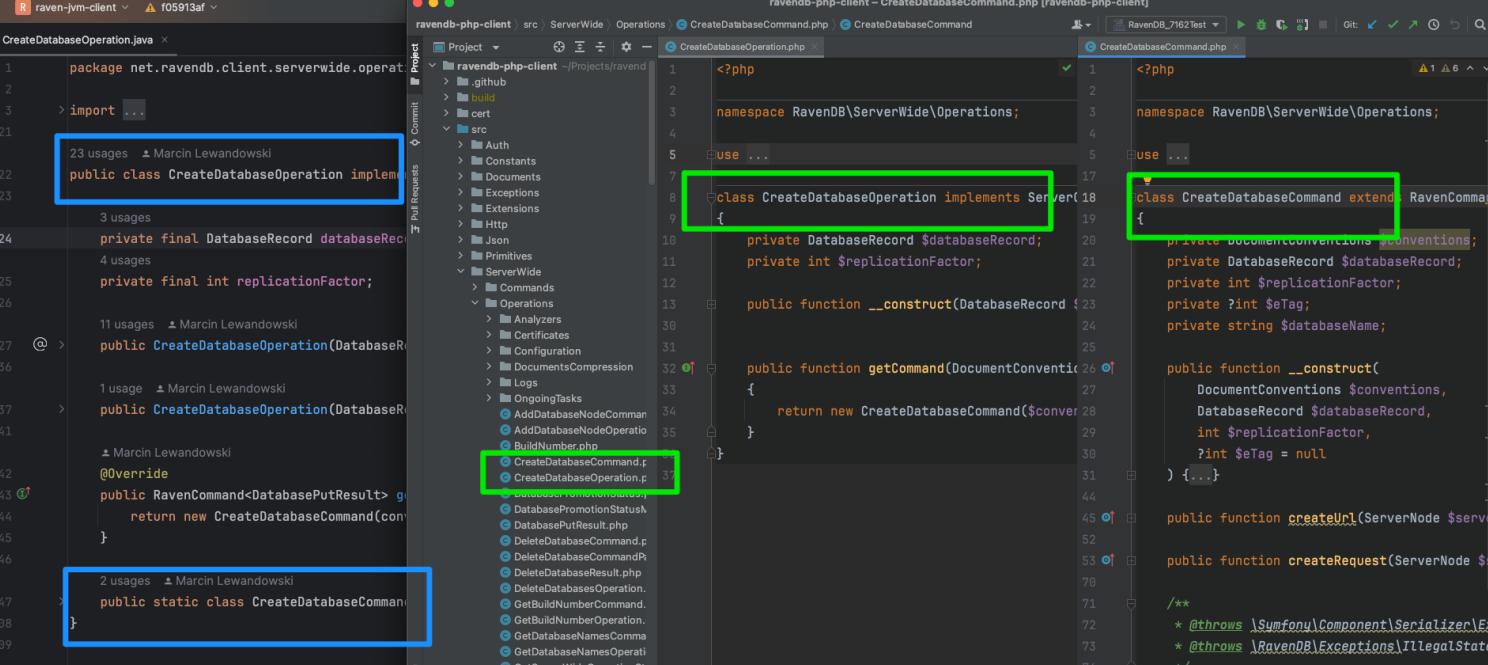
    /**
     * @param array $parameters
     * @return string
     */
    public function createUrl(array $parameters): string {
        $url = "http://{$parameters['server']}:{$_ENV['RAVENDB_PORT']}/documents";
        if (!empty($parameters['query'])) {
            $url .= "?q={$parameters['query']}";
        }
        return $url;
    }

    /**
     * @param array $parameters
     * @return HttpRequestBase
     */
    public function createRequest(ServerNode $serverNode, Reference<String> $url): HttpRequestBase {
        $request = new HttpRequest("GET", $url->Value);
        $request->Headers->Authorization = "Basic " . base64_encode($serverNode->Username . ":" . $serverNode->Password);
        return $request;
    }
}
```

The code editor interface includes a toolbar at the top, a navigation bar with tabs for `Components`, `Commands`, and `GetDocumentsCommand.php`, and a status bar at the bottom showing file paths and icons.

one class per file

pravila igre



The image shows two side-by-side code editors illustrating the 'one class per file' principle.

Left Editor (Java):

- File: `CreateDatabaseOperation.java`
- Content highlights:
 - Line 23: `public class CreateDatabaseOperation implements ...` (highlighted with a blue box)
 - Line 37: `public static class CreateDatabaseCommand` (highlighted with a blue box)

Right Editor (PHP):

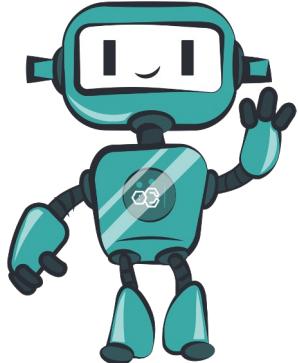
- File: `CreateDatabaseCommand.php`
- Content highlights:
 - Line 8: `class CreateDatabaseOperation implements Server...` (highlighted with a green box)
 - Line 18: `class CreateDatabaseCommand extends RavenCommand` (highlighted with a green box)

Static analyser tools

pravila igre



#1 SINGLE SOURCE OF TRUTH

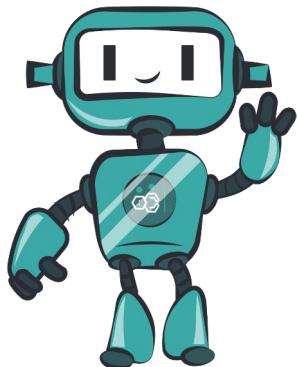


#2

KRENI SA TESTOVIMA

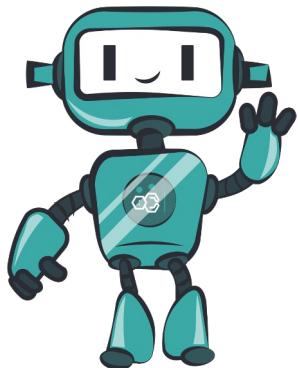
Happy path tests

Bug fix tests



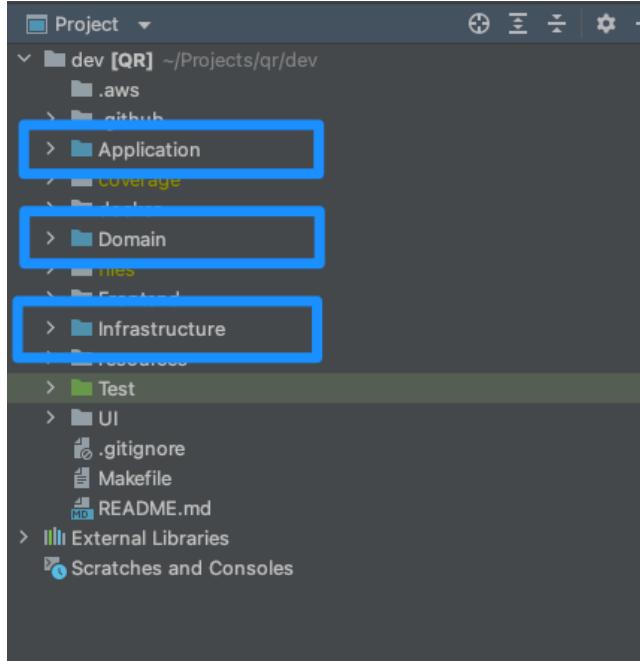
#3

RAZDVOJITI INFRASTRUKTURU OD BIZNIS LOGIKE



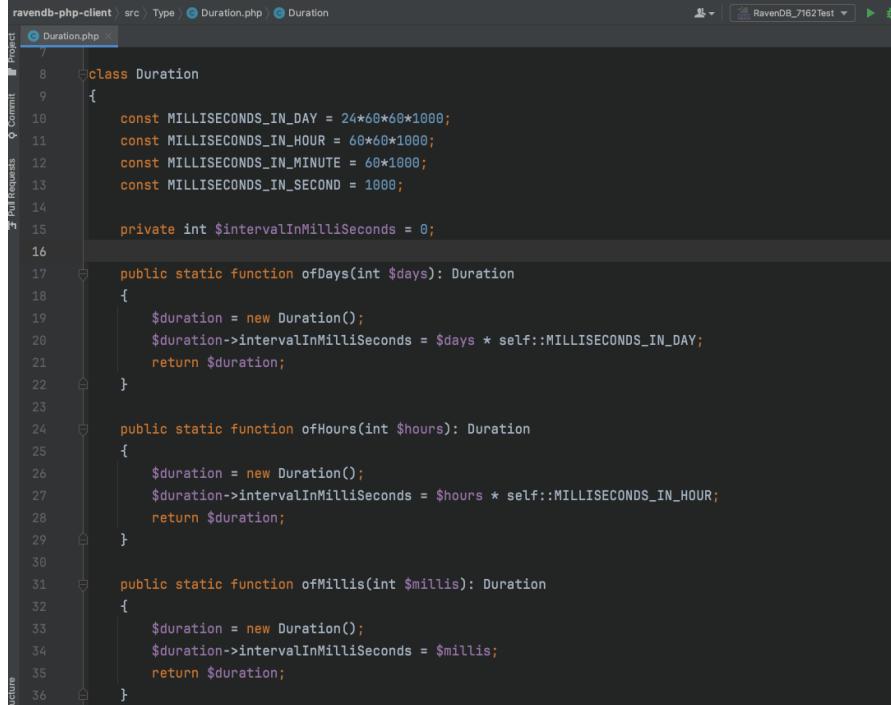
Razdvoj kod

Infrastruktura i biznis logika



Domenske klase

Infrastruktura i biznis logika



A screenshot of a code editor showing the `Duration.php` file from the `ravendb-php-client` project. The code defines a `Duration` class with static methods to create durations from days, hours, and milliseconds.

```
class Duration
{
    const MILLISECONDS_IN_DAY = 24*60*60*1000;
    const MILLISECONDS_IN_HOUR = 60*60*1000;
    const MILLISECONDS_IN_MINUTE = 60*1000;
    const MILLISECONDS_IN_SECOND = 1000;

    private int $intervalInMilliSeconds = 0;

    public static function ofDays(int $days): Duration
    {
        $duration = new Duration();
        $duration->intervalInMilliSeconds = $days * self::MILLISECONDS_IN_DAY;
        return $duration;
    }

    public static function ofHours(int $hours): Duration
    {
        $duration = new Duration();
        $duration->intervalInMilliSeconds = $hours * self::MILLISECONDS_IN_HOUR;
        return $duration;
    }

    public static function ofMillis(int $millis): Duration
    {
        $duration = new Duration();
        $duration->intervalInMilliSeconds = $millis;
        return $duration;
    }
}
```

Adapteri za korištene biblioteke



Infrastruktura i biznis logika

The screenshot shows a code editor with the file `HttpClient.php` open. The file is part of the `ravendb-php-client` project, specifically within the `Http\Adapter` directory. The code implements the `HttpClientInterface` and includes logic for creating a client and returning it.

```
<?php

namespace RavenDB\Http\Adapter;

use ...

class HttpClient implements HttpClientInterface
{
    private static ?SymfonyHttpClientInterface $client = null;

    private static string $proxy;

    private array $clientOptions;

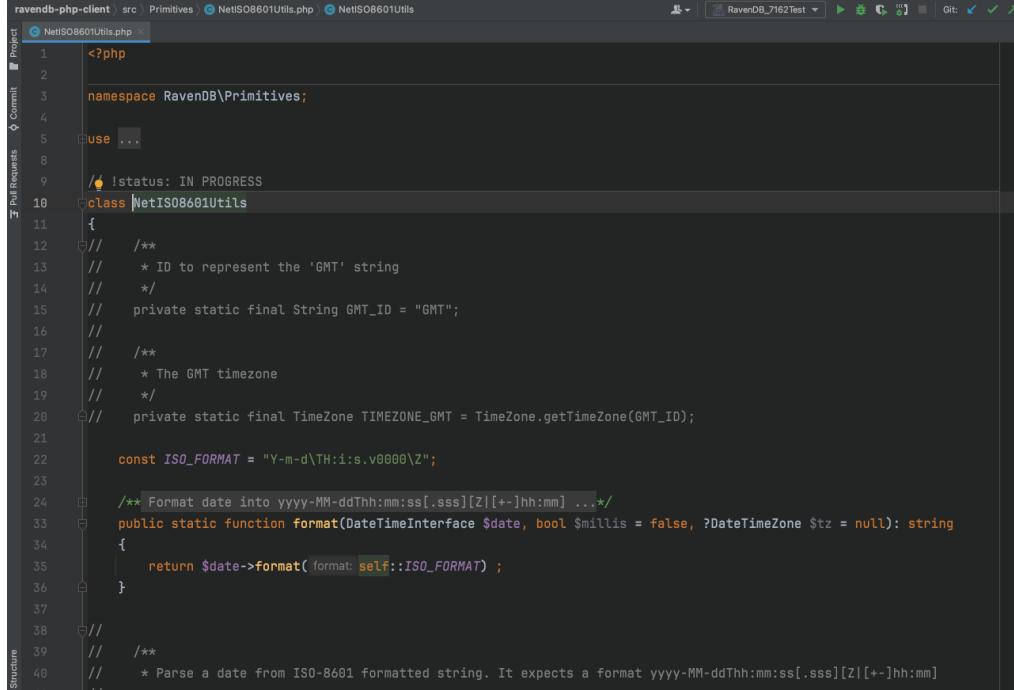
    public function __construct(array $options = [])
    {
        $this->clientOptions = $options;
    }

    protected function getClient(): SymfonyHttpClientInterface
    {
        if ($self::$client == null) {
            self::$client = SymfonyHttpClient::create();
        }
        return self::$client;
    }

    /**
     * @throws Exception
     * @throws TransportExceptionInterface
     */
}
```

Koristi prednosti jezika

Infrastruktura i biznis logika



The screenshot shows a code editor with a dark theme, displaying a file named `NetISO8601Utils.php`. The code is part of the `RavenDB\Primitives` namespace and defines a class `NetISO8601Utils`. The class contains several static methods, including `format` and `parse`, which handle ISO 8601 date strings. The code uses PHPDoc comments for documentation.

```
<?php

namespace RavenDB\Primitives;

use ...

/**
 * !status: IN PROGRESS
class NetISO8601Utils
{
    /**
     * ID to represent the 'GMT' string
     */
    private static final String GMT_ID = "GMT";

    /**
     * The GMT timezone
     */
    private static final TimeZone TIMEZONE_GMT = TimeZone.getTimeZone(GMT_ID);

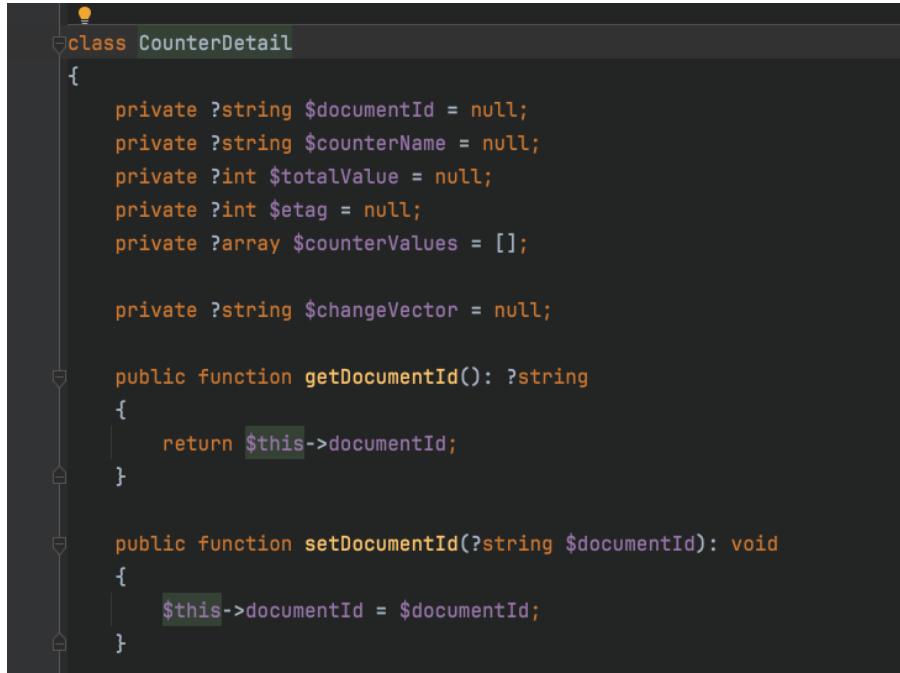
    const ISO_FORMAT = "Y-m-d\TH:i:s.v000\Z";

    /**
     * Format date into yyyy-MM-ddThh:mm:ss[.sss][Z|[-]hh:mm] ...
     */
    public static function format(DateTimeInterface $date, bool $millis = false, ?DateTimeZone $tz = null): string
    {
        return $date->format(format: self::ISO_FORMAT);
    }

    /**
     * Parse a date from ISO-8601 formatted string. It expects a format yyyy-MM-ddThh:mm:ss[.sss][Z|[-]hh:mm]
     */
}
```

Uvek inicijalizuj promenljive

Infrastruktura i biznis logika



```
class CounterDetail
{
    private ?string $documentId = null;
    private ?string $counterName = null;
    private ?int $totalValue = null;
    private ?int $etag = null;
    private ?array $counterValues = [];

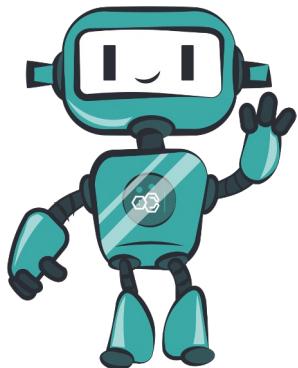
    private ?string $changeVector = null;

    public function getDocumentId(): ?string
    {
        return $this->documentId;
    }

    public function setDocumentId(?string $documentId): void
    {
        $this->documentId = $documentId;
    }
}
```

#4

MAPIRAJ BIZNIS LOGIKU UVEK NA ISTI NAČIN



Mapiranje

Mapiranje biznis logike

```

if (conventions.getLoadBalanceBehavior() == LoadBalanceBehavior.USE_SESSION_CONTEXT)
    if (sessionInfo != null && sessionInfo.canUseLoadBalanceBehavior()) {
        return _nodeSelector.getNodeBySessionId(sessionInfo.getSessionId());
    }

    if (!cmd.isReadRequest()) {
        return _nodeSelector.getPreferredNode();
    }

    switch (conventions.getReadBalanceBehavior()) {
        case NONE:
            return _nodeSelector.getPreferredNode();
        case ROUND_ROBIN:
            return _nodeSelector.getNodeBySessionId(sessionInfo != null ? sessionInfo.getSessionId() : null);
        case FASTEST_NODE:
            return _nodeSelector.getFastestNode();
        default:
            throw new IllegalArgumentException();
    }
}

if ($this->conventions->getLoadBalanceBehavior()->isUseSessionContext()) {
    if ($sessionInfo != null && $sessionInfo->canUseLoadBalanceBehavior()) {
        return $this->nodeSelector->getNodeBySessionId($sessionInfo->getSessionId());
    }

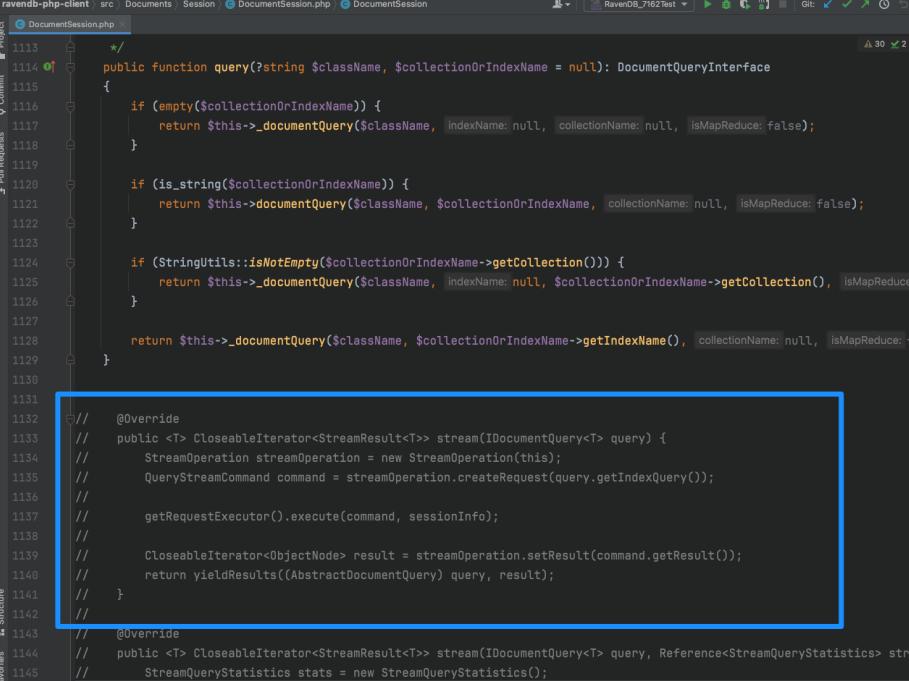
    if (!$cmd->isReadRequest()) {
        return $this->nodeSelector->getPreferredNode();
    }

    switch ($this->conventions->getReadBalanceBehavior()->getValue()) {
        case ReadBalanceBehavior::NONE:
            return $this->nodeSelector->getPreferredNode();
        case ReadBalanceBehavior::ROUND_ROBIN:
            return $this->nodeSelector->getNodeBySessionId( sessionId: $sessionInfo->getSessionId() );
        case ReadBalanceBehavior::FASTEST_NODE:
            return $this->nodeSelector->getFastestNode();
        default:
            throw new InvalidArgumentException();
    }
}

```

Tehnika: Copy/Paste

Mapiranje biznis logike



```
1113     */
1114     public function query(?string $className, ?string $collectionOrIndexName = null): DocumentQueryInterface
1115     {
1116         if (empty($collectionOrIndexName)) {
1117             return $this->_documentQuery($className, indexName: null, collectionName: null, isMapReduce: false);
1118         }
1119
1120         if (is_string($collectionOrIndexName)) {
1121             return $this->documentQuery($className, $collectionOrIndexName, collectionName: null, isMapReduce: false);
1122         }
1123
1124         if (StringUtils::isNotEmpty($collectionOrIndexName->getCollection())) {
1125             return $this->_documentQuery($className, indexName: null, $collectionOrIndexName->getCollection(), isMapReduce: false);
1126         }
1127
1128         return $this->_documentQuery($className, $collectionOrIndexName->getIndexName(), collectionName: null, isMapReduce: false);
1129     }
1130
1131
1132     /**
1133     * @Override
1134     * public <?> CloseableIterator<StreamResult<?>> stream(IObjectQuery<?> query) {
1135     *     StreamOperation streamOperation = new StreamOperation(this);
1136     *     QueryStreamCommand command = streamOperation.createRequest(query.getIndexQuery());
1137     *     getRequestExecutor().execute(command, sessionInfo);
1138     *
1139     *     CloseableIterator<ObjectNode> result = streamOperation.setResult(command.getResult());
1140     *     return yieldResults((AbstractDocumentQuery) query, result);
1141     * }
1142     */
1143
1144     /**
1145     * @Override
1146     * public <?> CloseableIterator<StreamResult<?>> stream(IObjectQuery<?> query, Reference<StreamQueryStatistics> stats) {
1147         StreamQueryStatistics stats = new StreamQueryStatistics();
1148     }
1149 }
```

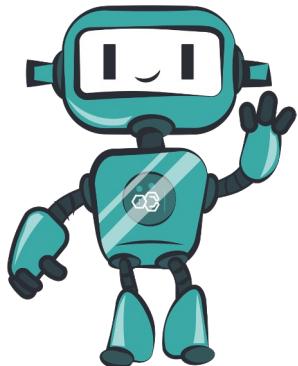
#5

IZBEGAVAJ

METHOD/CONSTRUCT

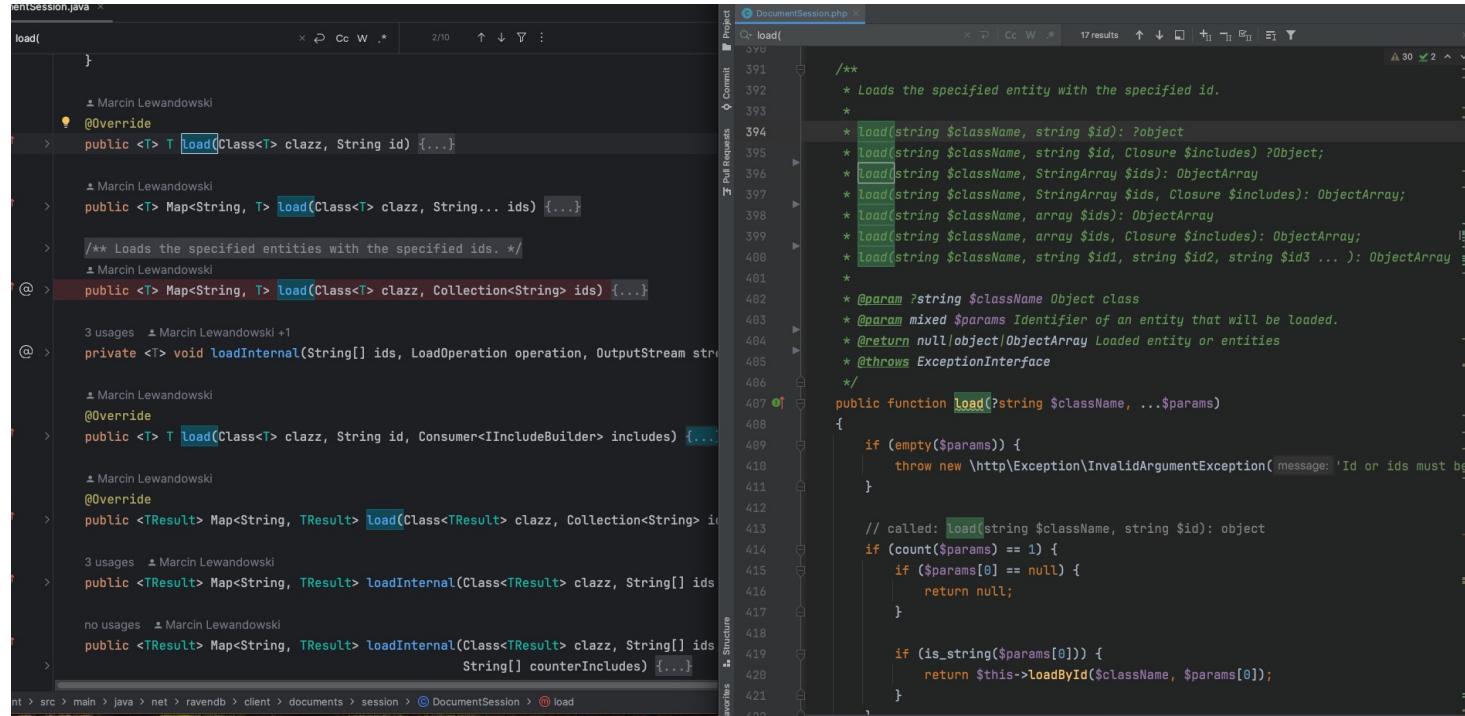
OVERLOADING

ili bar koristi isti redosled parametara



Dinamički parametri

Method overloading



`EntitySession.java`

```

load()
    }

    ▲ Marcin Lewandowski
    > @Override
    >     public <T> T load(Class<T> clazz, String id) {...}

    ▲ Marcin Lewandowski
    >     public <T> Map<String, T> load(Class<T> clazz, String... ids) {...}

    >     /** Loads the specified entities with the specified ids. */
    ▲ Marcin Lewandowski
    >     public <T> Map<String, T> load(Class<T> clazz, Collection<String> ids) {...}

    3 usages ▲ Marcin Lewandowski +1
    >     private <T> void loadInternal(String[] ids, LoadOperation operation, OutputStream stream)

    ▲ Marcin Lewandowski
    @Override
    >     public <T> T load(Class<T> clazz, String id, Consumer<IIncludeBuilder> includes) {...}

    ▲ Marcin Lewandowski
    @Override
    >     public <TResult> Map<String, TResult> load(Class<TResult> clazz, Collection<String> id
    3 usages ▲ Marcin Lewandowski
    >     public <TResult> Map<String, TResult> loadInternal(Class<TResult> clazz, String[] ids
    no usages ▲ Marcin Lewandowski
    >     public <TResult> Map<String, TResult> loadInternal(Class<TResult> clazz, String[] ids
        String[] counterIncludes) {...}

```

`DocumentSession.php`

```

load()
    /**
     * Loads the specified entity with the specified id.
     *
     * @param string $className Object class
     * @param mixed $params Identifier of an entity that will be loaded.
     * @return null|object/ObjectArray Loaded entity or entities
     * @throws ExceptionInterface
     */
    public function load(?string $className, ...$params)
    {
        if (empty($params)) {
            throw new \http\Exception\InvalidArgumentException(message: 'Id or ids must be provided');
        }

        // called: load(string $className, string $id): object
        if (count($params) == 1) {
            if ($params[0] == null) {
                return null;
            }

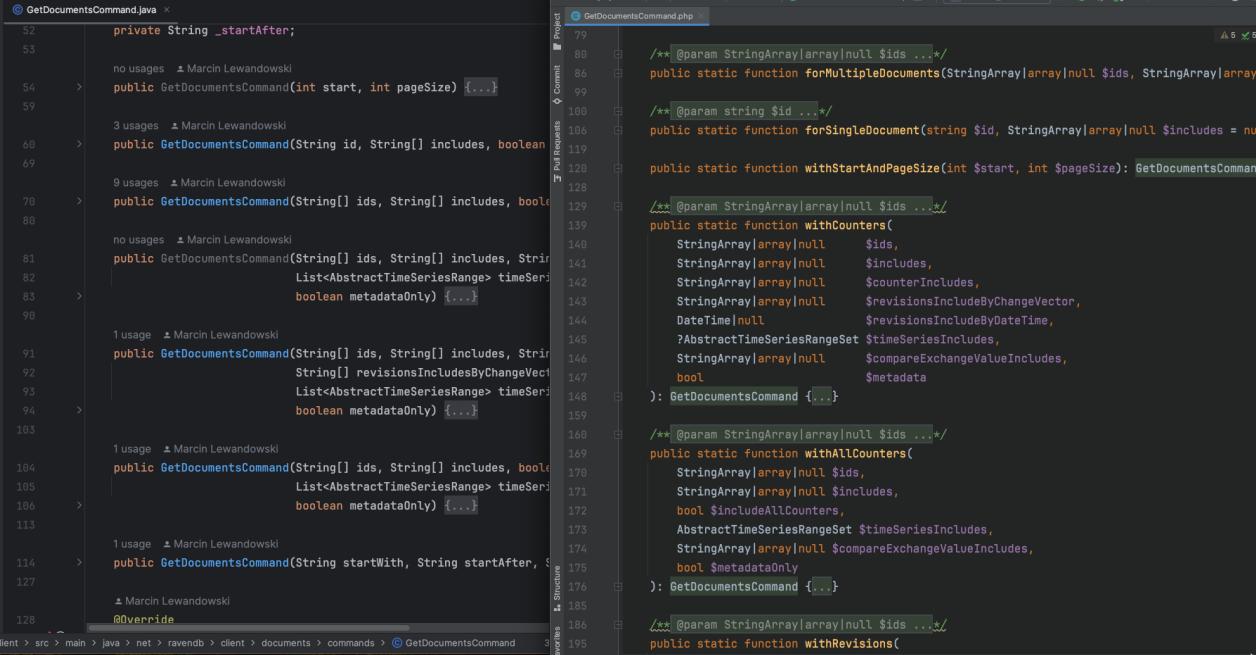
            if (is_string($params[0])) {
                return $this->loadById($className, $params[0]);
            }
        }
    }

```

File tree: `src > main > java > net > ravendb > client > documents > session > DocumentSession > @load`

Named constructors

Method overloading



The image shows two code editors side-by-side, illustrating the implementation of a named constructor pattern across different programming languages.

Java Implementation (GetDocumentsCommand.java):

```

52     private String _startAfter;
53
54     no usages ▾ Marcin Lewandowski
55     public GetDocumentsCommand(int start, int pageSize) { ... }
56
57     3 usages ▾ Marcin Lewandowski
58     public GetDocumentsCommand(String id, String[] includes, boolean
59                               metadataOnly) { ... }
60
61     9 usages ▾ Marcin Lewandowski
62     public GetDocumentsCommand(String[] ids, String[] includes, boolean
63                               metadataOnly) { ... }
64
65     no usages ▾ Marcin Lewandowski
66     public GetDocumentsCommand(String[] ids, String[] includes, String[]
67                               revisionsIncludesByChangeVector,
68                               List<AbstractTimeSeriesRange> timeSeries,
69                               boolean metadataOnly) { ... }
70
71     1 usage ▾ Marcin Lewandowski
72     public GetDocumentsCommand(String[] ids, String[] includes, String[]
73                               revisionsIncludesByChangeVector,
74                               List<AbstractTimeSeriesRange> timeSeries,
75                               boolean metadataOnly) { ... }
76
77     1 usage ▾ Marcin Lewandowski
78     public GetDocumentsCommand(String[] ids, String[] includes, boolean
79                               metadataOnly) { ... }
80
81     1 usage ▾ Marcin Lewandowski
82     public GetDocumentsCommand(String[] ids, String[] includes, String[]
83                               revisionsIncludesByChangeVector,
84                               List<AbstractTimeSeriesRange> timeSeries,
85                               boolean metadataOnly) { ... }
86
87     1 usage ▾ Marcin Lewandowski
88     public GetDocumentsCommand(String startWith, String startAfter, String
89                               _startAfter) { ... }
90
91     ▾ Marcin Lewandowski
92     @Override
93
94
95
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```

PHP Implementation (GetDocumentsCommand.php):

```

79
80     /**
81      * @param StringArray|array|null $ids ...
82     */
83     public static function forMultipleDocuments(StringArray|array|null $ids, StringArray|array|
84
85     /**
86      * @param string $id ...
87     */
88     public static function forSingleDocument(string $id, StringArray|array|null $includes = null)
89
90
91     public static function withStartAndPageSize(int $start, int $pageSize): GetDocumentsCommand
92
93     /**
94      * @param StringArray|array|null $ids ...
95     */
96     public static function withCounters(
97         StringArray|array|null $ids,
98         StringArray|array|null $includes,
99         StringArray|array|null $counterIncludes,
100        StringArray|array|null $revisionsIncludeByChangeVector,
101        DateTime|null $revisionsIncludeByDateTime,
102        ?AbstractTimeSeriesRangeSet $timeSeriesIncludes,
103        StringArray|array|null $compareExchangeValueIncludes,
104        bool $metadata
105    ): GetDocumentsCommand { ... }
106
107     /**
108      * @param StringArray|array|null $ids ...
109     */
110     public static function withAllCounters(
111         StringArray|array|null $ids,
112         StringArray|array|null $includes,
113         bool $includeAllCounters,
114         AbstractTimeSeriesRangeSet $timeSeriesIncludes,
115         StringArray|array|null $compareExchangeValueIncludes,
116         bool $metadataOnly
117     ): GetDocumentsCommand { ... }
118
119     /**
120      * @param StringArray|array|null $ids ...
121     */
122     public static function withRevisions(
123
124
125
126
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```

Rekapitulacija



SINGLE SOURCE OF TRUTH

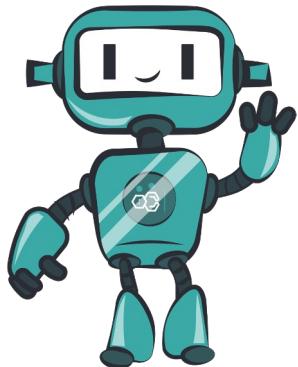
KRENI SA TESTOVIMA

RAZDVOJ INFRA OD BIZNIS LOGIKE

MAPIRAJ UVEK NA ISTI NAČIN

UVEK ISTI REDOSLED PARAMETARA

Hvala na pažnji!



Pitanja???

