

[illegible]

# SPRING AI

## GENERATIVE ARTIFICIAL INTELLIGENCE CON JAVA

Simone Scannapieco

Corso base per Venis S.p.A, Venezia, Italia

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### Note

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and extend across the width of the page, providing a template for writing or drawing. There are no margins, text, or other markings on the paper.



## IMPLICIT E ZERO-SHOT PROMPTING

### Note

[illegible]

- ➔ Strategia: atto di fede nei confronti del LLM
  - ➔ Utente fornisce solo l'*input* su cui lavorare
  - ➔ *Output* del LLM determinato dalle sue **capacità emergenti**
  - ⚠ LLM determina la *task* dal contenuto dell'*input* e dalla sua formattazione
  - ⚠ Preferire formato strutturato di *markdown* nel definire l'*input* (rendere il processo di **cattura dei pattern** più semplice)
- ➔ Vantaggi
  - ➔ Semplice da utilizzare
- ➔ Svantaggi
  - ➔ Visto come esercizio di stile
  - ➔ Molto limitato a *task* semplici (focalizzate sul puro significato dei *token*)

[illegible]

## ➔ Perché non utilizzare esempi...?

## This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, leaving small margins at the top and bottom. There are no vertical margin lines, and the paper is completely blank except for the lines.

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## TRADUZIONE MULTILINGUA

### Note

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```
package it.venis.ai.spring.demo.model;

public record TranslationRequest(String lemma) {}
```

[illegible]



**File** get-lemma-translation-prompt.st

```
ITA:ciao->ENG:hello,ESP:hola,GER:hallo,FR:bonjour|
ITA:casa->ENG:house,ESP:casa,GER:haus,FR:maison|
ITA:{lemma}->
```

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```
package it.venis.ai.spring.demo.services;

import it.venis.ai.spring.demo.model.Answer;
import it.venis.ai.spring.demo.model.ArtifactRequest;
import it.venis.ai.spring.demo.model.DefinitionRequest;
import it.venis.ai.spring.demo.model.DefinitionResponse;
import it.venis.ai.spring.demo.model.Question;

public interface GeminiFromClientService {

    String getAnswerFromClient(String question);

    Answer getAnswerFromClient(Question question);

    Answer getDefinitionFromClient(DefinitionRequest definitionRequest);

    Answer getCustomFormatDefinitionFromClient(DefinitionRequest definitionRequest);

    Answer getJSONUserFormatDefinitionFromClient(DefinitionRequest definitionRequest);

    DefinitionResponse getJSONOutputConverterFormatDefinitionFromClient(DefinitionRequest definitionRequest);

    Answer getTranslationForLemma(TranslationRequest translationRequest);

}
```

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```
package it.venis.ai.spring.demo.services;

import java.util.Map;
import org.springframework.ai.chat.client.ChatClient;
import org.springframework.ai.template.st.StTemplateRenderer;
import org.springframework.beans.factory.annotation.Value;
import org.springframework.core.io.Resource;
import org.springframework.stereotype.Service;
import it.venis.ai.spring.demo.model.Answer;
import it.venis.ai.spring.demo.model.DefinitionRequest;
import it.venis.ai.spring.demo.model.Question;

@Service
public class GeminiFromClientServiceImpl implements GeminiFromClientService {

    private final ChatClient chatClient;

    public GeminiFromClientServiceImpl(ChatClient.Builder chatClientBuilder) {
        this.chatClient = chatClientBuilder.build();
    }

    @Override
    public String getAnswerFromClient(String question) {
        return this.chatClient.prompt()
            .user(question)
            .call()
            .content();
    }
}
```

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```

...
@Value("classpath:templates/get-lemma-translation-prompt.st")
private Resource lemmaTranslationPrompt;

@Override
public Answer getTranslationForLemma(TranslationRequest translationRequest) {

    List<String> stopSequences = Stream.of(" ", "|", "\n").collect(Collectors.toList());

    String chatResponse = this.chatClient.prompt()
        .options(ChatOptions.builder()
            .model("gemini-2.0-flash")
            .temperature(0.1)
            //.topP(1.0)
            //.topK(30)
            .maxTokens(20)
            //.frequencyPenalty(0.1)
            //.presencePenalty(0.1)
            .stopSequences(stopSequences)
            .build())
        .user(u -> u.text(this.lemmaTranslationPrompt)
            .params(Map.of("lemma", translationRequest.lemma())))
        .templateRenderer(StTemplateRenderer.builder().startDelimiterToken('{')
            .endDelimiterToken('}')
            .build())
        .call()
        .content();

    return new Answer(chatResponse);
}
}

```

### Note

[illegible]

```
package it.venis.ai.spring.demo.controllers;

import org.springframework.web.bind.annotation.RestController;
...
import it.venis.ai.spring.demo.services.GeminiFromClientService;
import org.springframework.web.bind.annotation.PostMapping;
import org.springframework.web.bind.annotation.RequestBody;

@RestController
public class QuestionFromClientController {

    private final GeminiFromClientService geminiService;

    ...

    @PostMapping("/client/definition/json/user")
    public Answer getJSONUserFormatDefinition(@RequestBody DefinitionRequest definitionRequest) {

        return this.geminiService.getJSONUserFormatDefinitionFromClient(definitionRequest);

    }

    ...

    @PostMapping("/client/translate")
    public Answer getTranslationForLemma(@RequestBody TranslationRequest translationRequest) {

        return this.geminiService.getTranslationForLemma(translationRequest);

    }

}
```

### Note

[illegible]

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## This image shows a single sheet of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page. There are approximately 20 lines visible. The paper has a slight shadow on the right side, suggesting it's resting on a surface.



## SENTIMENT ANALYSIS

### Note

[illegible]

```
package it.venis.ai.spring.demo.data;

public enum ArtifactType {

    LIBRO("Libro"),
    FILM("Film"),
    SPETTACOLO("Spettacolo"),
    ARTICOLO("Articolo");

    private String artifactType;

    ArtifactType(String artifactType) {
        this.artifactType = artifactType;
    }

    public String getArtifactType() {
        return artifactType;
    }

}
```

### Note

[illegible]



```
package it.venis.ai.spring.demo.data;

public enum Sentiment {

    MOLTO_POSITIVO("molto positivo"),
    POSITIVO("positivo"),
    NEUTRALE("neutrale"),
    NEGATIVO("negativo"),
    MOLTO_NEGATIVO("molto negativo");

    private String sentiment;

    Sentiment(String sentiment) {
        this.sentiment = sentiment;
    }

    public String getSentiment() {
        return sentiment;
    }

}
```

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```
package it.venis.ai.spring.demo.model;

import java.util.Objects;

import it.venis.ai.spring.demo.data.ArtifactType;

public record Artifact(String title, String subtitle, ArtifactType type, String body) {

    @Override
    public String title() {
        return Objects.requireNonNullElse(this.title, "---");
    }

    @Override
    public String subtitle() {
        return Objects.requireNonNullElse(this.subtitle, "---");
    }
}
```

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```
package it.venis.ai.spring.demo.model;

import java.util.UUID;

public record ArtifactRequest(UUID id, Artifact artifact) {

    public ArtifactRequest(String title, Artifact artifact) {
        this(UUID.randomUUID(), artifact);
    }

}
```

### Note

[illegible]

**File** get-artifact-sentiment-prompt.st

```

Classifica recensioni di artefatti come |MOLTO_POSITIVO|POSITIVO|NEUTRALE|
NEGATIVO|MOLTO_NEGATIVO|.
Restituisci la risposta usando la minima formattazione possibile, senza markdown
e senza spazi finali.
Recensione {artefatto}: {recensione}
Sentimento:

```

### Note

[illegible]

```
package it.venis.ai.spring.demo.services;

import it.venis.ai.spring.demo.model.Answer;
import it.venis.ai.spring.demo.model.ArtifactRequest;
import it.venis.ai.spring.demo.model.DefinitionRequest;
import it.venis.ai.spring.demo.model.DefinitionResponse;
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public interface GeminiFromClientService {

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    Answer getAnswerFromClient(Question question);

    Answer getDefinitionFromClient(DefinitionRequest definitionRequest);

    Answer getCustomFormatDefinitionFromClient(DefinitionRequest definitionRequest);

    Answer getJSONUserFormatDefinitionFromClient(DefinitionRequest definitionRequest);

    DefinitionResponse getJSONOutputConverterFormatDefinitionFromClient(DefinitionRequest definitionRequest);

    Answer getTranslationForLemma(TranslationRequest translationRequest);

    Answer getSentimentForArtifact(ArtifactRequest artifactRequest);

}
```

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```
package it.venis.ai.spring.demo.services;

import java.util.Map;
import org.springframework.ai.chat.client.ChatClient;
import org.springframework.ai.template.st.StTemplateRenderer;
import org.springframework.beans.factory.annotation.Value;
import org.springframework.core.io.Resource;
import org.springframework.stereotype.Service;
import it.venis.ai.spring.demo.model.Answer;
import it.venis.ai.spring.demo.model.DefinitionRequest;
import it.venis.ai.spring.demo.model.Question;

@Service
public class GeminiFromClientServiceImpl implements GeminiFromClientService {

    private final ChatClient chatClient;

    public GeminiFromClientServiceImpl(ChatClient.Builder chatClientBuilder) {
        this.chatClient = chatClientBuilder.build();
    }

    @Override
    public String getAnswerFromClient(String question) {
        return this.chatClient.prompt()
            .user(question)
            .call()
            .content();
    }
}
```

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```

...
@Value("classpath:templates/get-artifact-sentiment-prompt.st")
private Resource artifactSentimentPrompt;

@Override
public Answer getSentimentForArtifact(ArtifactRequest artifactRequest) {
    List<String> stopSequences = Stream.of(" ", "\n").collect(Collectors.toList());
    Sentiment chatResponse = Sentiment.valueOf(this.chatClient.prompt()
        .options(ChatOptions.builder()
            .model("gemini-2.0-flash")
            .temperature(0.1)
            // .topP(1.0)
            // .topK(30)
            .maxTokens(10)
            // .frequencyPenalty(0.1)
            // .presencePenalty(0.1)
            .stopSequences(stopSequences)
            .build())
        .user(u -> u.text(this.artifactSentimentPrompt)
            .params(Map.of("recensione", artifactRequest.artifact().body(),
                "artefatto", artifactRequest.artifact().type())))
        .templateRenderer(StTemplateRenderer.builder().startDelimiterToken('{')
            .endDelimiterToken('}')
            .build())
        .call()
        .content()
        );
    return new Answer(chatResponse.getSentiment());
}
}

```

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package it.venis.ai.spring.demo.controllers;

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...
import it.venis.ai.spring.demo.services.GeminiFromClientService;
import org.springframework.web.bind.annotation.PostMapping;
import org.springframework.web.bind.annotation.RequestBody;

@RestController
public class QuestionFromClientController {

    private final GeminiFromClientService geminiService;

    ...

    @PostMapping("/client/definition/json/user")
    public Answer getJSONUserFormatDefinition(@RequestBody DefinitionRequest definitionRequest) {

        return this.geminiService.getJSONUserFormatDefinitionFromClient(definitionRequest);

    }

    ...

    @PostMapping("/client/sentiment")
    public Answer getSentiment(@RequestBody ArtifactRequest artifactRequest) {

        return this.geminiService.getSentimentForArtifact(artifactRequest);

    }

}
```

### Note

[illegible]



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[illegible]