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SPRING AI

GENERATIVE ARTIFICIAL INTELLIGENCE CON JAVA

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

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Note

[illegible]



STEP-BACK PROMPTING

Note

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- ➔ Strategia: attivare parti di conoscenza di *background* prima di utilizzare il LLM per la *task*
 - ➔ Primo *prompt* per chiedere informazioni generali correlate alla *task* finale
 - ➔ Secondo *prompt* per sfruttare tali informazioni come contesto specifico e risolvere la *task* finale
 - ⚠ Focalizzare l'attenzione del LLM su **parti della sua conoscenza**
- ➔ Vantaggi
 - ➔ Utente lavora molto poco sulla creazione del contesto
 - ➔ Contesti generalmente più mirati (generati dallo stesso LLM)
 - ➔ Tende a mitigare i *bias* cognitivi del LLM
- ➔ Svantaggi
 - ➔ Costoso (utilizzo di due meccanismi di *prompting*)

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- Simone Scannapieco

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

import java.util.Objects;
import com.fasterxml.jackson.annotation.JsonPropertyDescription;
import it.venis.ai.spring.demo.data.ArtifactType;

public record Artifact(@JsonPropertyDescription("Il titolo dell'opera") String title,
    @JsonPropertyDescription("Il sottotitolo dell'opera") String subtitle,
    @JsonPropertyDescription("Il tipo dell'opera") ArtifactType type,
    @JsonPropertyDescription("Il genere dell'opera") String genere,
    @JsonPropertyDescription("La trama o la recensione dell'opera") String body) {

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

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

    @Override
    public String genere() {
        return Objects.requireNonNullElse(this.genere, "non specificato");
    }
}
```

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Sei un agente con accesso alla più grande base dati di opere di categoria {artefatto} e genere {genere}.

Rispondi in modo puntuale e senza formule di introduzione.

Crea un elenco puntato di {numero} ambientazioni chiave per scrivere una trama avvincente e di successo.

[illegible]

File get-generated-artifact-prompt.st

Contesto: {lista}

Scegli una delle ambientazioni e scrivi in {numero} paragrafo/i la trama di un nuovo {artefatto} in materia di {genere} con una trama avvincente.

```
{formato}
```

Traduci titolo, sottotitolo, genere e corpo della risposta in lingua italiana.

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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 getSentimentForArtifact(ArtifactRequest artifactRequest);

    Answer getNERinYAMLForArtifact(ArtifactRequest artifactRequest);

    Answer getSuggestionForArtifact(ArtifactRequest artifactRequest);

    Artifact getGeneratedArtifact(ArtifactRequest artifactRequest, Integer numChoices, Integer numParagraphs);

}
```

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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-key-settings-for-artifact-system-prompt.st")
private Resource keySettingsForArtifactSystemPrompt;

@Value("classpath:templates/get-key-settings-for-artifact-user-prompt.st")
private Resource keySettingsForArtifactUserPrompt;

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

@Override
public Artifact getGeneratedArtifact(ArtifactRequest artifactRequest, Integer numChoices, Integer numParagraphs) {
    BeanOutputConverter<Artifact> converter = new BeanOutputConverter<>(Artifact.class);
    String listResponse = this.chatClient.prompt()
        .options(ChatOptions.builder()
            .model("gemini-2.0-flash")
            .temperature(1.0)
            //.topP(1.0)
            //.topK(30)
            .maxTokens(2000)
            //.frequencyPenalty(0.1)
            //.presencePenalty(0.1)
            .build())
        .system(s -> s.text(this.keySettingsForArtifactSystemPrompt)
            .params(Map.of("artefatto", artifactRequest.artifact().type().getArtifactType(),
                "genere", artifactRequest.artifact().genre())))
        .user(u -> u.text(this.keySettingsForArtifactUserPrompt)
            .params(Map.of("numero", numChoices)))
        .templateRenderer(StTemplateRenderer.builder().startDelimiterToken('{')
            .endDelimiterToken('}')
            .build())
        .call()
        .content();
}
...

```

Note

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```

...
String generatedArtifact = this.chatClient.prompt()
    .options(ChatOptions.builder()
        .model("gemini-2.0-flash")
        .temperature(1.0)
        //.topP(1.0)
        //.topK(30)
        .maxTokens(1024)
        //.frequencyPenalty(0.1)
        //.presencePenalty(0.1)
        .build())
    .user(u -> u.text(this.generatedArtifactPrompt)
        .params(Map.of("lista", listResponse,
            "numero", numParagraphs,
            "artefatto", artifactRequest.artifact().type(),
            "genere", artifactRequest.artifact().genre(),
            "formato", converter.getFormat()))
    .templateRenderer(StTemplateRenderer.builder().startDelimiterToken('{')
        .endDelimiterToken('}')
        .build())
    .call()
    .content();

return converter.convert(generatedArtifact);
}
}

```

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```
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/advice")
    public Answer getSuggestionForArtifact(@RequestBody ArtifactRequest artifactRequest) {

        return this.geminiService.getSuggestionForArtifact(artifactRequest);

    }

    @PostMapping("/client/generate")
    public Artifact getGeneratedArtifact(@RequestBody ArtifactRequest artifactRequest,
        @RequestParam(required = true, defaultValue = "3") Integer numChoices,
        @RequestParam(required = true, defaultValue = "1") Integer numParagraphs) {

        return this.geminiService.getGeneratedArtifact(artifactRequest, numChoices, numParagraphs);

    }

}
```

Note

[illegible]

- 13 / 14

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Branch: 16-spring-ai-gemini-step-back-prompting

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