8 - Pratica: Agentes com CrewAI (III)

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Descrição da atividade

O objetivo dessa atividade é fazer um multi-agente com CrewAI.

Iniciamos a atividade com um vídeo do CrewAI exemplificando como é feita a criação de multi-agentes e logo em seguida um vídeo explicativo sobre quais são os requisitos para um agente.

Requisitos para um agente ser ótimo:

Roleplay: Basicamente quer dizer que cada agente desempenha melhor a sua função quando faz algo específico, assim como na vida real, um engenheiro desempenha melhor o papel de engenheiro que de farmacêutico, por exemplo. Então se quisermos extrair o melhor do nosso agente, ele não deve ser multi-tarefas, devemos ter um agente para cada objetivo.

Foco: Assim como o roleplay, o foco está diretamente ligado ao objetivo do agente. O foco do agente, para obter uma resposta melhor é um único objetivo, um único contexto, um único prompt por agente. Deixando-o assim especialista em um único assunto.

Tools: Dar ao nosso agente apenas as tools que são relativas ao seu objetivo.

Collaboration: Habilidade que os agentes têm de cooperar entre si, de compartilhar feedbacks, resultado de tarefas, etc. Dessa forma, funcionam como uma "empresa" onde os colaboradores conseguem acompanhar e entender as tarefas dos seus colegas.

Guardrails: É o que faz com que o nosso agente não alucine, ele é responsável por manter o nosso agente dentro do seu papel.

Memória: Existem alguns tipos de memória, a de prazo curto, que dura apenas o tempo do diálogo. A memória a longo prazo, onde as interações são armazenadas para futuras consultas, para entender o contexto completo que o usuário está usando o agente. O último tipo de memória, o entity memory, é muito parecida com a memória de longo prazo, basicamente o contexto, os diálogos, tudo é armazenado para que as respostas sejam melhor produzidas, aprendendo com as interações e erros passados.

Construção de um multi-agente para escrever um artigo

Para criar esse agente precisaremos da biblioteca do crewai e de um LLM, no nosso caso vamos usar o GEMINI, pois a licença é gratuita.

Para a estrutura do agente precisamos de três itens: role, goal e backstory.

O *role* é o seu título e função principal.

O *goal* é o seu objetivo como agente.

O *backstory* pode ser visto como as instruções e como a função vai ser realizada, diria que pode ser visto como o *prompt* visto nos *cards* anteriores.

Podemos definir cada um dos agentes através de uma classe.

No caso da aula, para um artigo ser bem escrito, foi definido que teríamos 3 agentes: Planejador, escritor e editor. Abaixo podemos ver como foi feito:

```python
planner = Agent(
    role="Content Planner",
    goal="Plan engaging and factually accurate content on {topic}",
    backstory="You're working on planning a blog article "
              "about the topic: {topic}."
              "You collect information that helps the "
              "audience learn something "
              "and make informed decisions. "
              "Your work is the basis for "
              "the Content Writer to write an article on this topic.",
    allow_delegation=False,
    verbose=True
)
```

```python
writer = Agent(
    role="Content Writer",
    goal="Write insightful and factually accurate "
         "opinion piece about the topic: {topic}",
    backstory="You're working on a writing "
              "a new opinion piece about the topic: {topic}. "
              "You base your writing on the work of "
              "the Content Planner, who provides an outline "
              "and relevant context about the topic. "
              "You follow the main objectives and "
              "direction of the outline, "
              "as provide by the Content Planner. "
              "You also provide objective and impartial insights "
              "and back them up with information "
              "provide by the Content Planner. "
              "You acknowledge in your opinion piece "
              "when your statements are opinions "
              "as opposed to objective statements.",
    allow_delegation=False,
    verbose=True
)
```

```python
editor = Agent(
    role="Editor",
    goal="Edit a given blog post to align with "
        "the writing style of the organization. ",
    backstory="You are an editor who receives a blog post "
            "from the Content Writer. "
            "Your goal is to review the blog post "
            "to ensure that it follows journalistic best practices,"
            "provides balanced viewpoints "
            "when providing opinions or assertions, "
            "and also avoids major controversial topics "
            "or opinions when possible.",
    allow_delegation=False,
    verbose=True
)
```

Sobre a construção dos agentes, dois pontos que são citados no vídeo do Crewai: podemos ou não permitir que o agente crie e delegue tarefas para outros agentes atravpes do "*allow_delegation*" e podemos ou não permitir que ele seja falador através do "*verbose*", dessa forma vamos poder acompanhar o que o agente está fazendo. Ponto interessante sobre o *verbose* é que podemos definir qual a intensidade de comuniucação.

Além de criar os agentes, precisamos definir, também através de uma classe, quais serão as tarefas realizadas por esses agentes.

```python
write = Task(
    description=(
        "1. Use the content plan to craft a compelling "
            "blog post on {topic}.\n"
        "2. Incorporate SEO keywords naturally.\n"
        "3. Sections/Subtitles are properly named "
            "in an engaging manner.\n"
        "4. Ensure the post is structured with an "
            "engaging introduction, insightful body, "
            "and a summarizing conclusion.\n"
        "5. Proofread for grammatical errors and "
            "alignment with the brand's voice.\n"
    ),
    expected_output="A well-written blog post "
        "in markdown format, ready for publication, "
        "each section should have 2 or 3 paragraphs.",
    agent=writer,
)
```

```python
plan = Task(
    description=(
        "1. Prioritize the latest trends, key players, "
            "and noteworthy news on {topic}.\n"
        "2. Identify the target audience, considering "
            "their interests and pain points.\n"
        "3. Develop a detailed content outline including "
            "an introduction, key points, and a call to action.\n"
        "4. Include SEO keywords and relevant data or sources."
    ),
    expected_output="A comprehensive content plan document "
        "with an outline, audience analysis, "
        "SEO keywords, and resources.",
    agent=planner,
)
```

```python
edit = Task(
    description=("Proofread the given blog post for "
                "grammatical errors and "
                "alignment with the brand's voice."),
    expected_output="A well-written blog post in markdown format, "
                "ready for publication, "
                "each section should have 2 or 3 paragraphs.",
    agent=editor
)
```

Após isso utilizamos a biblioteca do Crewai para unir os agentes e suas tarefas, nesse caso o tópico da tarefa é um parâmetro de entrada, que foi definido no exemplo da aula como Artificial Intelligence. O resultado é um texto muito longo que pode ser observado rodando o código.

```python
crew = Crew(
    agents=[planner, writer, editor],
    tasks=[plan, write, edit],
    verbose=2
)


result = crew.kickoff(inputs={"topic": "Artificial Intelligence"})


from IPython.display import Markdown
Markdown(result)
```

Prática:

Decidi fazer um agente de viagens para treinar a criação de agentes com o Crewai:

```python
planner = Agent(
role="Travelling Agency",
goal = "Give a overview based on expendings to {topic}",
backstory="You're working on a travel agency and are doing a research "
"about the place: {topic}."
"You collect price information about the plane ticket, acommodations, also necessities"
"and the local weather, so people can plan a good vacation",
allow_delegation=False,
verbose=True
)


guide = Agent(
role="You are a local guide",
goal="To guide the traveller at the local landmarks",
backstory="You're working on a travelling agency as a tourist guide"
"You're giving information about the landmarks at {topic}."
"You make a list of the most importants landmarks"
"your input is give the average time spending on each landmark, which is next to each"
"You also provides a list of typical food"
"You also give information about the transport to each landmark "
"Also give the idea of how much expend in each landmark",
allow_delegation=False,
verbose=True
)
```

```python
plan = Task(
description=(
"1. Give information about plane tickets price to {topic}"
    "2. Give information about acomodations price"
"3. Inform about weather e better months to visit"),
expected_output="A average total cost of a travel for the choosen place"
"with the information about weather, vacines, and other must have to ",
agent=planner,
)


guide_list = Task(
description=(
"1. You're giving information about the top 7 landmarks at {topic}."
"2. You give the average time spending on each landmark, which is next to each other."
"3. You also provide a list of typical food."
"4. You also give information about the transport to each landmark."
"5. Also give the idea of how much expend in each landmark."),
expected_output="A list very complete to a traveller with landmarks,"
"prices, transportation and expenses at which local",
agent=guide,
)
```

Resultado:

```
[DEBUG]: == Working Agent: Travelling Agency
 [INFO]: == Starting Task: 1. Give information about plane tickets
price to Rio de Janeiro2. Give information about acomodations price
```

> **Entering new CrewAgentExecutor chain...**
I now can give a great answer based on the information collected for the research on Rio de Janeiro.

Final Answer:
1. Plane tickets to Rio de Janeiro can vary depending on the time of booking and the airline chosen. On average, a round trip ticket from major cities in the US ranges from $600 to $1200. It is recommended to book in advance to get the best prices.

2. Accommodation prices in Rio de Janeiro also vary depending on the location and type of accommodation. A budget hotel or hostel can cost around $30 to $80 per night, while a mid-range hotel can cost between $80 to $150 per night. Luxury hotels can range from $150 to $300 or more per night.

3. The weather in Rio de Janeiro is generally warm and tropical throughout the year. The best months to visit are from December to March, during the summer season, when temperatures are higher and there is less chance of rain. It is important to pack light clothing, sunscreen, and insect repellent when visiting Rio de Janeiro.

In conclusion, the average total cost of a trip to Rio de Janeiro, including plane tickets, accommodation, and other expenses, can range from $1500 to $3000 depending on the traveler's preferences and budget. It is recommended to plan ahead and research the best deals to make the most out of your vacation in Rio de Janeiro.

> **Finished chain.**
 [DEBUG]: == [Travelling Agency] Task output: 1. Plane tickets to Rio de Janeiro can vary depending on the time of booking and the airline chosen. On average, a round trip ticket from major cities in the US ranges from $600 to $1200. It is recommended to book in advance to get the best prices.

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[DEBUG]: == Working Agent: You are a local guide
[INFO]: == Starting Task: 1. You're giving information about the top 7 landmarks at Rio de Janeiro.2. You give the average time spending on each landmark, which is next to each other.3. You also provide a list of typical food.4. You also give information about the transport to each landmark.5. Also give the idea of how much expend in each landmark.

> Entering new CrewAgentExecutor chain...
I now can give a great answer

Final Answer:

Top 7 Landmarks in Rio de Janeiro:

1. Christ the Redeemer (Cristo Redentor)
- Average Time Spent: 2-3 hours
- Typical Food: Try a traditional Brazilian dish like Feijoada
- Transport: Take a taxi or public bus to the Corcovado Train Station, then take the train up to the statue
- Expense: Entrance fee to the Christ the Redeemer statue is around $20

2. Sugarloaf Mountain (Pão de Açúcar)
- Average Time Spent: 2-3 hours
- Typical Food: Enjoy a refreshing açai bowl
- Transport: Take a cable car from Praia Vermelha to the top of Sugarloaf Mountain
- Expense: Cable car tickets cost approximately $25

3. Copacabana Beach
- Average Time Spent: Half a day
- Typical Food: Taste a traditional Brazilian snack like Coxinha
- Transport: Easily accessible by public bus or taxi
- Expense: Free to visit the beach, food and drink prices vary

4. Ipanema Beach
- Average Time Spent: Half a day
- Typical Food: Sip on a refreshing caipirinha cocktail
- Transport: Can be reached by public transportation or taxi
- Expense: Free to visit the beach, food and drink prices vary

5. Tijuca National Park
- Average Time Spent: 4-5 hours
- Typical Food: Try a delicious Picanha steak
- Transport: Take a guided tour or hire a private driver to explore the park
- Expense: Entrance fee to the park is around $10

6. Maracanã Stadium
- Average Time Spent: 1-2 hours
- Typical Food: Indulge in a tasty Brigadeiro dessert
- Transport: Take a taxi or public transportation to the stadium
- Expense: Stadium tour tickets cost approximately $10

7. Selarón Steps (Escadaria Selarón)
- Average Time Spent: 1-2 hours

- Typical Food: Have a refreshing coconut water
- Transport: Accessible by public transportation or taxi
- Expense: Free to visit the steps, souvenirs and snacks available for purchase

Overall, the total cost of visiting these top landmarks in Rio de Janeiro can range from $100 to $200, depending on entrance fees, transportation, food, and any additional expenses. It is recommended to budget accordingly and enjoy the rich culture and beauty of Rio de Janeiro.

> Finished chain.
[DEBUG]: == [You are a local guide] Task output: Top 7 Landmarks in Rio de Janeiro:

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```

Dificuldades

Tive muitas dificuldades a tentar instalar a biblioteca do crewai na minha máquina, não consegui rodar localmente de forma alguma. Tive que improvisar utilizando o jupyter do próprio curso do crew para testar o código.

Conclusões

A criação de agentes dedicados pelo Crewai é uma tarefa simples e a explicação do João Moura é ótima. Mas a instalação foi mais difícil do que imaginei.

Referências

Multi AI Agent Systems with crewAI. (n.d.). Retrieved from https://learn.deeplearning.ai/courses/multi-ai-agent-systems-with-crewai/lesson/uqyat/key-elements-of-ai-agents. Acesso em 14 abr 2025.

Quickstart. (n.d.). Retrieved from https://docs.crewai.com/quickstart. Acesso em 14 abr 2025.