第六课

基础作业

完成以下任务，并将实现过程记录截图：

环境配置

1. 创建开发机和 conda 环境

在创建开发机界面选择镜像为 Cuda12.2-conda，并选择 GPU 为30% A100。

进入**开发机**后，配置环境以同时满足 Lagent 和 AgentLego 运行时所需依赖。

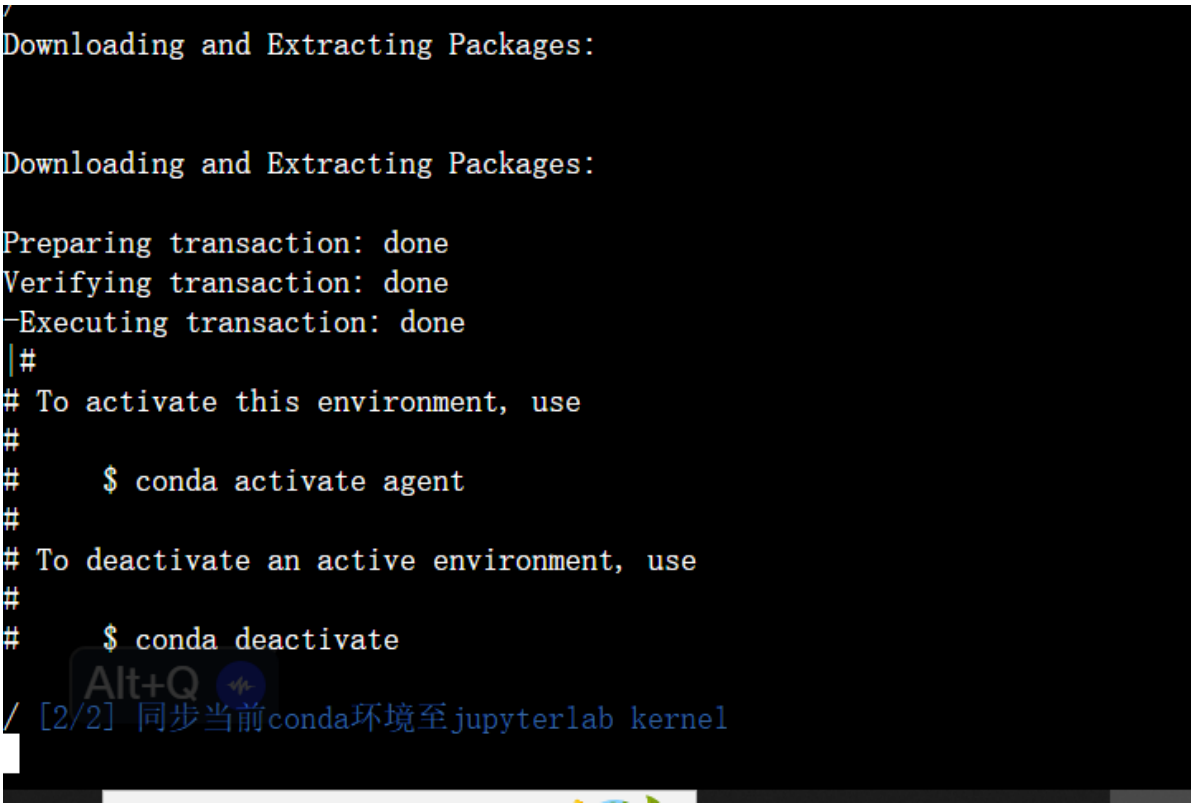
在开始配置环境前，创建用于存放 Agent 相关文件的目录

```
mkdir -p /root/agent
```

配置 conda 环境

```
studio-conda -t agent -o pytorch-2.1.2
```

显示下图就是初始化环境成功了。



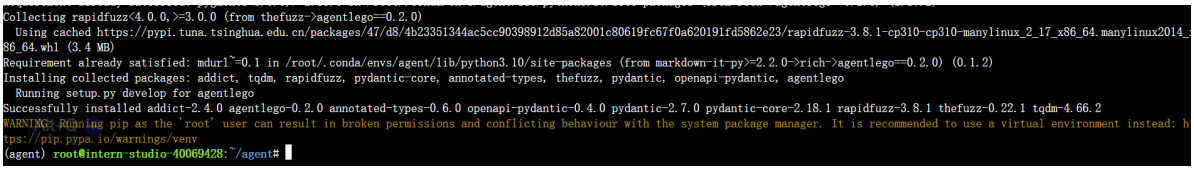
2. 安装 Lagent 和 AgentLego

Lagent 和 AgentLego 都提供了两种安装方法，一种是通过 pip 直接进行安装，另一种则是从源码进行安装。为了方便使用 Lagent 的 Web Demo 以及 AgentLego 的 WebUI，我们选择直接从源码进行安装。 此处附上源码安装的相关帮助文档：

- Lagent：https://lagent.readthedocs.io/zh-cn/latest/get_started/install.html
- AgentLego：https://agentlego.readthedocs.io/zh-cn/latest/get_started.html

可以执行如下命令进行安装：

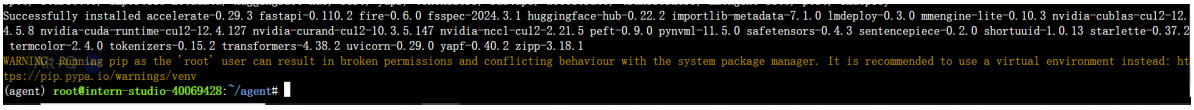
```
cd /root/agent
conda activate agent
git clone https://gitee.com/internlm/lagent.git
cd lagent && git checkout 581d9fb && pip install -e . && cd ..
git clone https://gitee.com/internlm/agentlego.git
cd agentlego && git checkout 7769e0d && pip install -e . && cd ..
```



3 安装其他依赖

在这一步中，我们将会安装其他将要用到的依赖库，如 LMDeploy，可以执行如下命令：

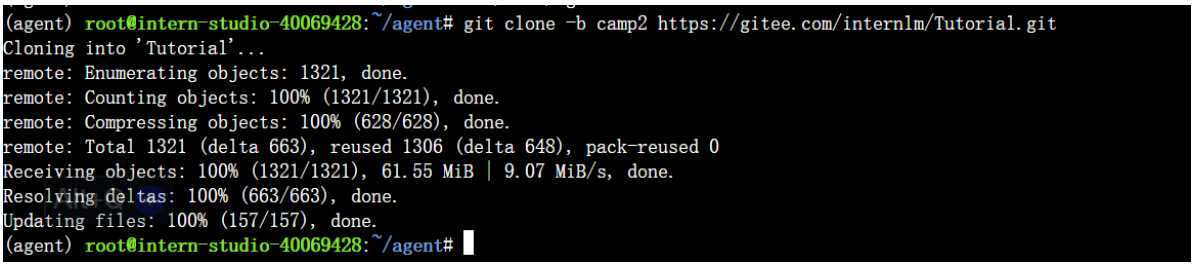
```
conda activate agent
pip install lmdeploy==0.3.0
```



4 准备 Tutorial

由于后续的 Demo 需要用到 tutorial 已经写好的脚本，因此我们需要将 tutorial 通过 git clone 的方法准备好，以备后续使用：

```
cd /root/agent
git clone -b camp2 https://gitee.com/internlm/Tutorial.git
```



A. Lagent Web Demo

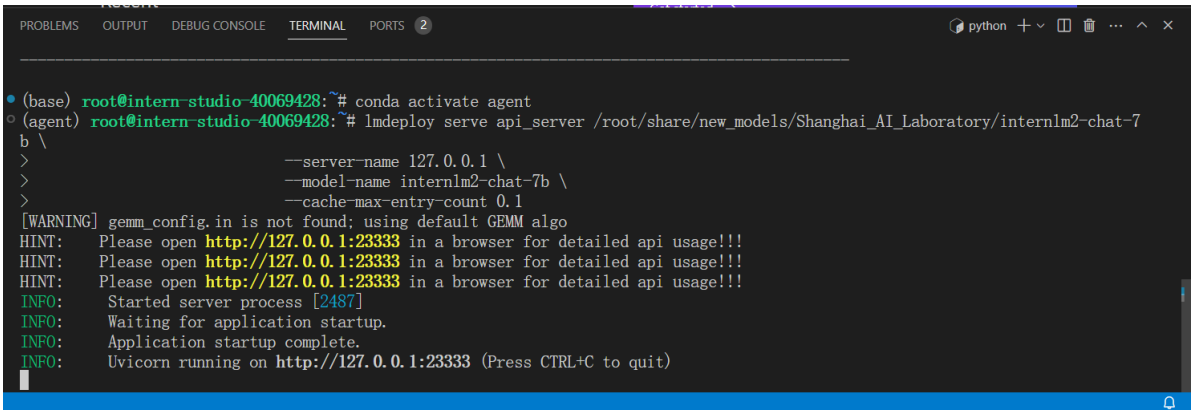
文档可见 [Lagent Web Demo]

1. Lagent Web Demo

1.1 使用 LMDeploy 部署

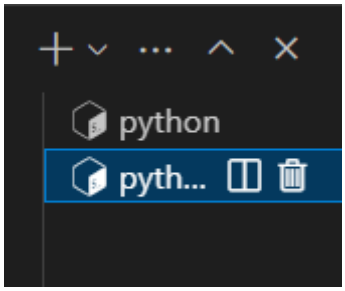
在 vscode terminal 中执行如下代码使用 LMDeploy 启动一个 api_server。

```
conda activate agent
lmdeploy serve api_server
/root/share/new_models/Shanghai_AI_Laboratory/internlm2-chat-7b \
                              --server-name 127.0.0.1 \
                              --model-name internlm2-chat-7b \
                              --cache-max-entry-count 0.1
```

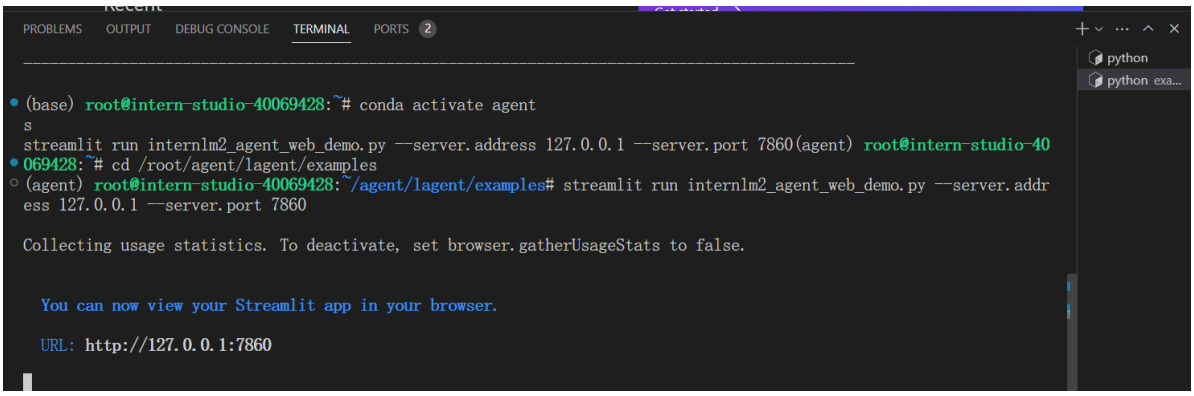


1.2 启动并使用 Lagent Web Demo

新建一个 terminal 以启动 Lagent Web Demo




```
conda activate agent
cd /root/agent/lagent/examples
streamlit run internlm2_agent_web_demo.py --server.address 127.0.0.1 --
server.port 7860
```

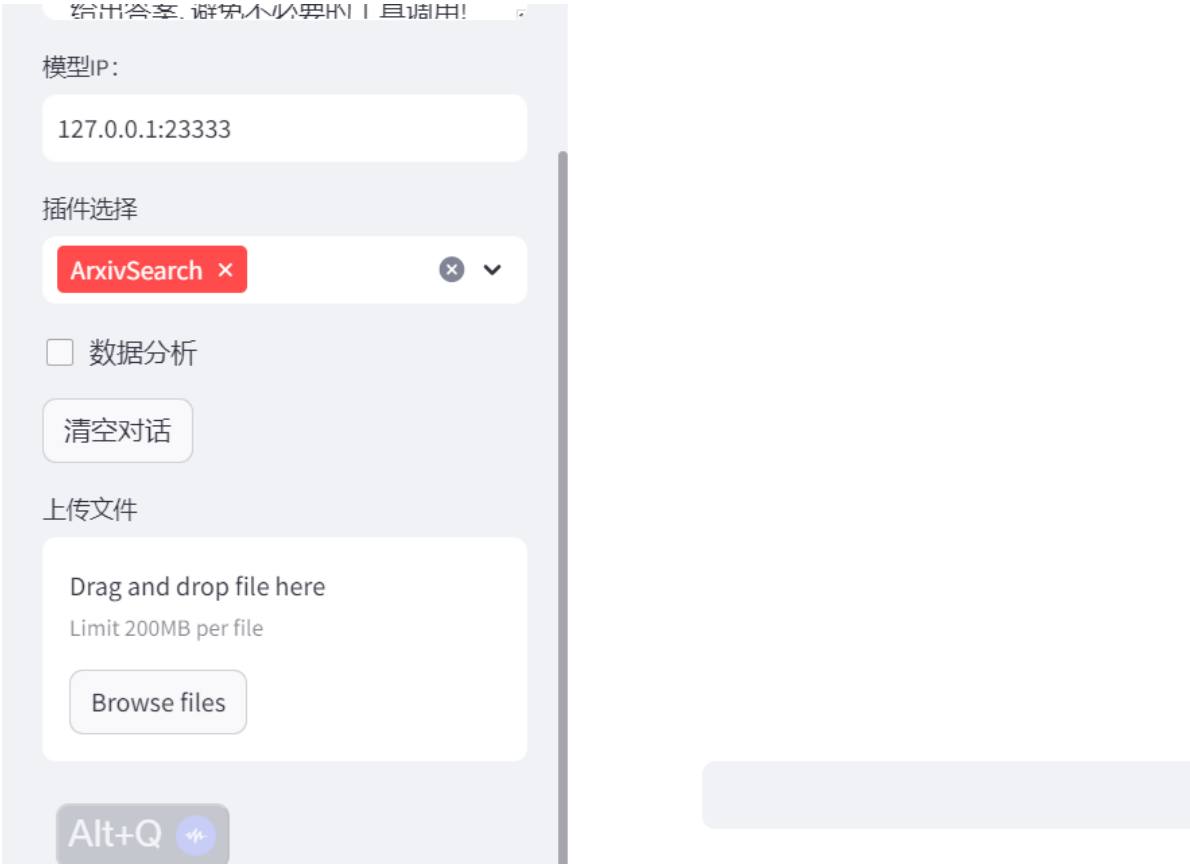


在等待 LMDeploy 的 api_server 与 Lagent Web Demo 完全启动后，在**本地**进行端口映射，将 LMDeploy api_server 的23333端口以及 Lagent Web Demo 的7860端口映射到本地。

```
C:\Windows\System32\OpenSSH\ssh -CNg -L 7860:127.0.0.1:7860 -L
23333:127.0.0.1:23333 root@ssh.intern-ai.org.cn -p 44841
```

```
(base) PS C:\Users\LTstatu>
(base) PS C:\Users\LTstatu> C:\Windows\System32\OpenSSH\ssh -CNg -L 7860:127.0.0.1:7860 -L 23333:127.0.0.1:23333 root@ss
h.intern-ai.org.cn -p 44841
The authenticity of host '[ssh.intern-ai.org.cn]:44841 ([8.130.47.207]:44841)' can't be established.
ECDSA key fingerprint is SHA256:edNH1U5xEglF1LC5tJcLSbigdQ2pYQjH0D49L6GcSAY.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '[ssh.intern-ai.org.cn]:44841,[8.130.47.207]:44841' (ECDSA) to the list of known hosts.
```

接下来在本地的浏览器页面中打开 http://localhost:7860 以使用 Lagent Web Demo。首先输入模型 IP 为 127.0.0.1:23333，**在输入完成后按下回车键以确认**。并选择插件为 ArxivSearch，以让模型获得在 arxiv 上搜索论文的能力。



输入“请帮我搜索 InternLM2 Technical Report” 以让模型搜索书生·浦语2的技术报告。

2 用 Lagent 自定义工具

Lagent 中关于工具部分的介绍文档位于 https://lagent.readthedocs.io/zh-cn/latest/tutorials/action.html 。使用 Lagent 自定义工具主要分为以下几步：

1. 继承 BaseAction 类
2. 实现简单工具的 run 方法；或者实现工具包内每个子工具的功能

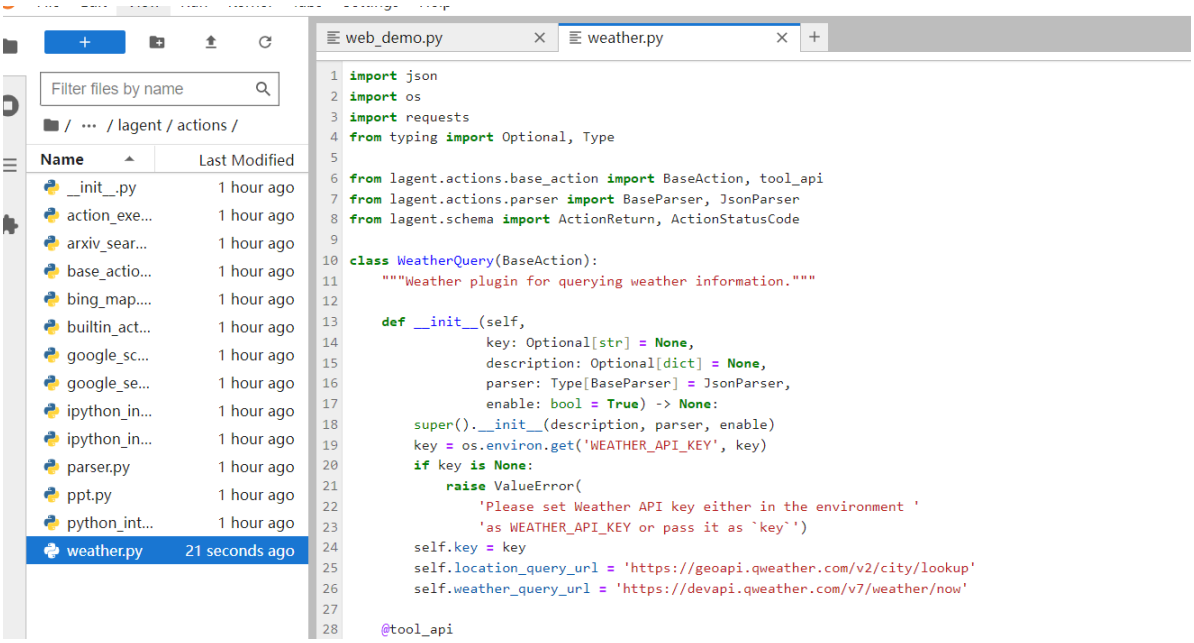
3. 简单工具的 run 方法可选被 tool_api 装饰；工具包内每个子工具的功能都需要被 tool_api 装饰

2.1 创建工具文件

首先通过 `touch /root/agent/lagent/lagent/actions/weather.py`（大小写敏感）新建工具文件，该文件内容如下：

```
import json
import os
import requests
from typing import Optional, Type

from lagent.actions.base_action import BaseAction, tool_api
from lagent.actions.parser import BaseParser, JsonParser
from lagent.schema import ActionReturn, ActionStatusCode

class WeatherQuery(BaseAction):
    """Weather plugin for querying weather information."""

    def __init__(self,
                 key: Optional[str] = None,
                 description: Optional[dict] = None,
                 parser: Type[BaseParser] = JsonParser,
                 enable: bool = True) -> None:
        super().__init__(description, parser, enable)
        key = os.environ.get('WEATHER_API_KEY', key)
        if key is None:
            raise ValueError(
                'Please set Weather API key either in the environment '
                'as WEATHER_API_KEY or pass it as `key`')
        self.key = key
        self.location_query_url = 'https://geoapi.qweather.com/v2/city/lookup'
        self.weather_query_url = 'https://devapi.qweather.com/v7/weather/now'

    @tool_api
    def run(self, query: str) -> ActionReturn:
        """一个天气查询API。可以根据城市名查询天气信息。

        Args:
            query (:class:`str`): The city name to query.
        """
        tool_return = ActionReturn(type=self.name)
        status_code, response = self._search(query)
        if status_code == -1:
            tool_return.errmsg = response
            tool_return.state = ActionStatusCode.HTTP_ERROR
        elif status_code == 200:
            parsed_res = self._parse_results(response)
            tool_return.result = [dict(type='text', content=str(parsed_res))]
            tool_return.state = ActionStatusCode.SUCCESS
        else:
            tool_return.errmsg = str(status_code)
            tool_return.state = ActionStatusCode.API_ERROR
        return tool_return

    def _parse_results(self, results: dict) -> str:
        """Parse the weather results from QWeather API.
```

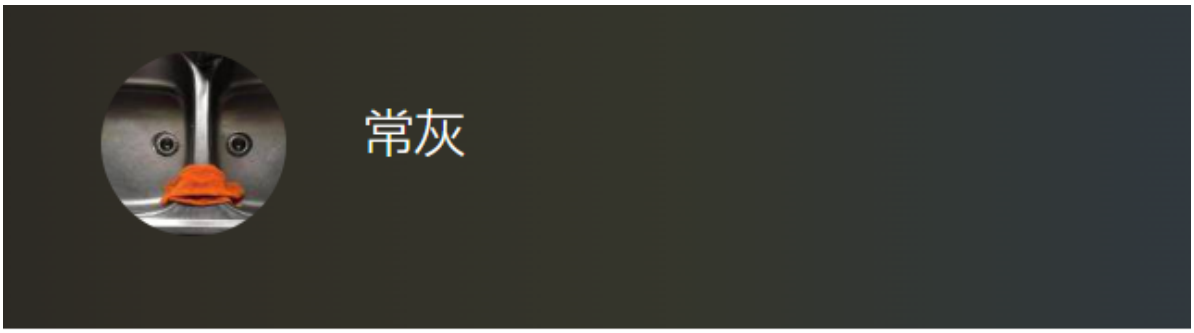
```
        Args:
            results (dict): The weather content from QWeather API
                in json format.

        Returns:
            str: The parsed weather results.
        """
        now = results['now']
        data = [
            f'数据观测时间: {now["obsTime"]}',
            f'温度: {now["temp"]}°C',
            f'体感温度: {now["feelsLike"]}°C',
            f'天气: {now["text"]}',
            f'风向: {now["windDir"]}，角度为 {now["wind360"]}°',
            f'风力等级: {now["windScale"]}，风速为 {now["windSpeed"]} km/h',
            f'相对湿度: {now["humidity"]}',
            f'当前小时累计降水量: {now["precip"]} mm',
            f'大气压强: {now["pressure"]} 百帕',
            f'能见度: {now["vis"]} km',
        ]
        return '\n'.join(data)

    def _search(self, query: str):
        # get city_code
        try:
            city_code_response = requests.get(
                self.location_query_url,
                params={'key': self.key, 'location': query}
            )
        except Exception as e:
            return -1, str(e)
        if city_code_response.status_code != 200:
            return city_code_response.status_code, city_code_response.json()
        city_code_response = city_code_response.json()
        if len(city_code_response['location']) == 0:
            return -1, '未查询到城市'
        city_code = city_code_response['location'][0]['id']
        # get weather
        try:
            weather_response = requests.get(
                self.weather_query_url,
                params={'key': self.key, 'location': city_code}
            )
        except Exception as e:
            return -1, str(e)
        return weather_response.status_code, weather_response.json()
```



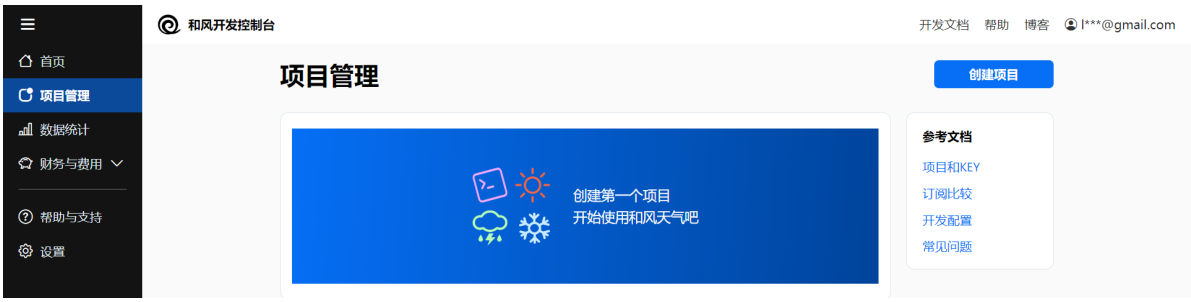
2.2 获取 API KEY

为了获得稳定的天气查询服务，我们首先要获取 API KEY。首先打开 https://dev.qweather.com/docs/api/ 后，点击右上角控制台。

创建项目之前要绑定手机号和邮箱



进入控制台创建项目



项目名称，免费订阅，**Web API** , key 的名称

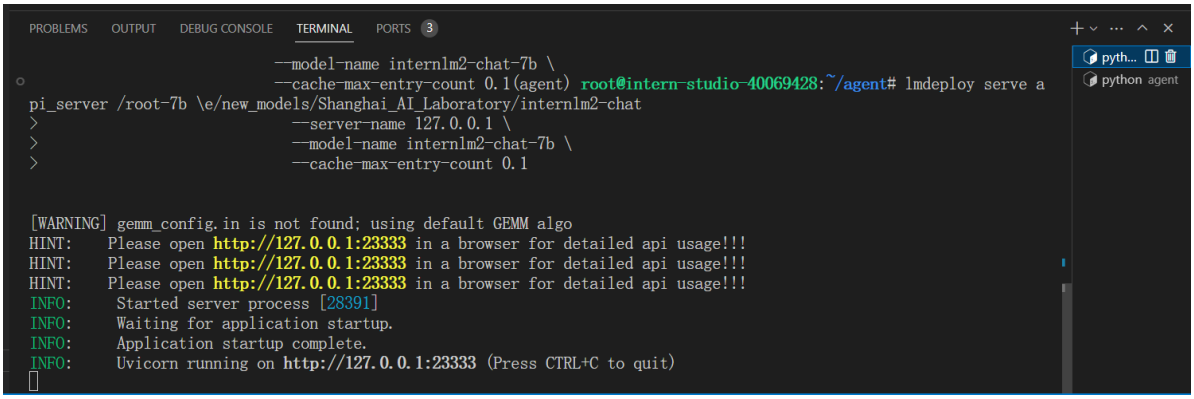
复制保存

2.3 体验自定义工具效果

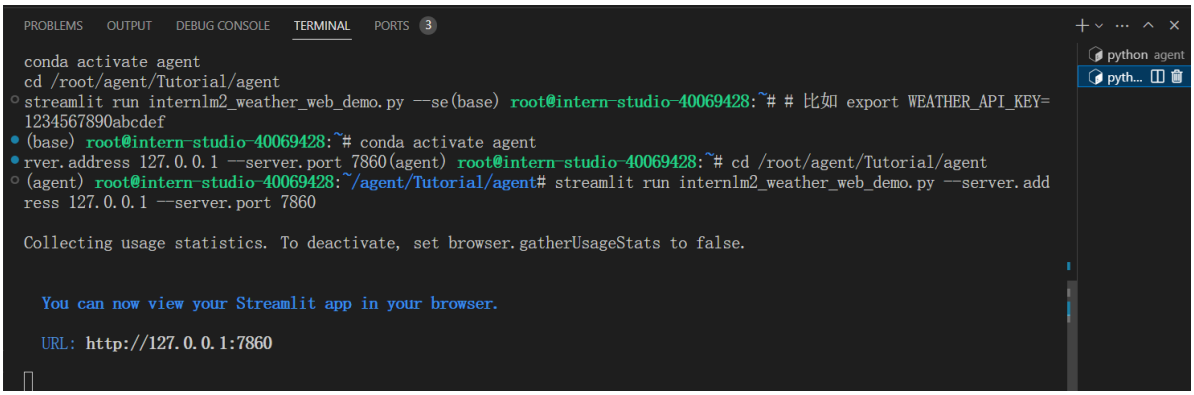
在两个 terminal 中分别启动 LMDeploy 服务和 Tutorial 已经写好的用于这部分的 Web Demo：

注意，确保 1.1 节中的 LMDeploy 服务以及 1.2 节中的 Web Demo 服务已经停止（即 terminal 已关闭），否则会出现 CUDA Out of Memory 或是端口已占用的情况！

```
conda activate agent
lmdeploy serve api_server
/root/share/new_models/Shanghai_AI_Laboratory/internlm2-chat-7b \
                            --server-name 127.0.0.1 \
                            --model-name internlm2-chat-7b \
                            --cache-max-entry-count 0.1
```




```
export WEATHER_API_KEY=bcf76aab7771431b81bdd005e9cc50c1
# 比如 export WEATHER_API_KEY=1234567890abcdef
conda activate agent
cd /root/agent/Tutorial/agent
streamlit run internlm2_weather_web_demo.py --server.address 127.0.0.1 --
server.port 7860
```



并在**本地**执行如下操作以进行端口映射：

```
C:\Windows\System32\OpenSSH\ssh -CNg -L 7860:127.0.0.1:7860 -L
23333:127.0.0.1:23333 root@ssh.intern-ai.org.cn -p 44841
```

测试效果

B. AgentLego

文档可见 [直接使用 AgentLego]

1. 直接使用 AgentLego

首先下载 demo 文件：

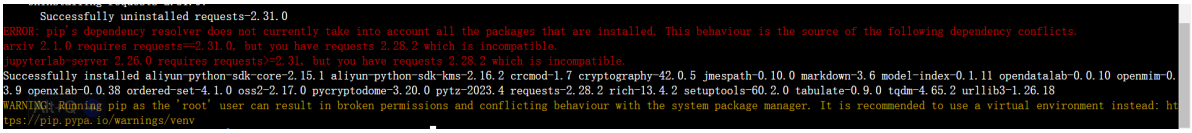
```
cd /root/agent
wget http://download.openmmlab.com/agentlego/road.jpg
```

由于 AgentLego 在安装时并不会安装某个特定工具的依赖，因此我们接下来准备安装目标检测工具运行时所需依赖。

AgentLego 所实现的目标检测工具是基于 mmdet (MMDetection) 算法库中的 RTMDet-Large 模型，因此我们首先安装 mim，然后通过 mim 工具来安装 mmdet。

```
conda activate agent
pip install openmim==0.3.9
mim install mmdet==3.3.0
```

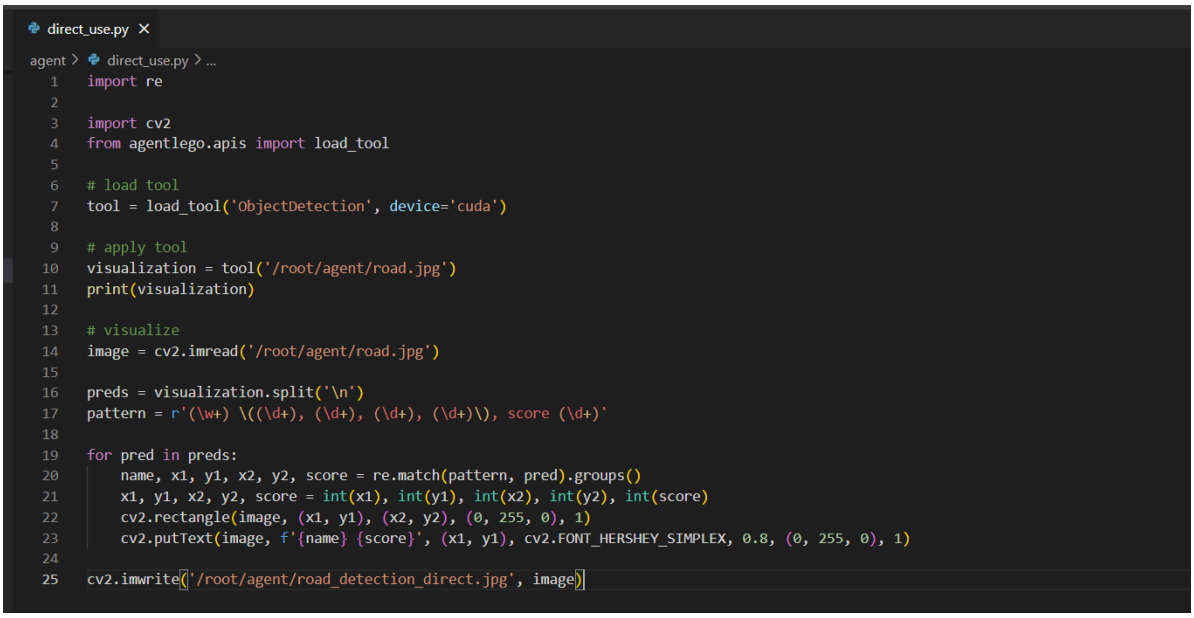
在安装完成后，**可能**会观察到以下现象（如下图所示），但请放心，这是正常现象，这并不会影响到我们的使用。



然后通过 `touch /root/agent/direct_use.py` 新建 direct_use.py 以直接使用目标检测工具，填充 direct_use.py 代码

```
import re

import cv2
from agentlego.apis import load_tool

# load tool
tool = load_tool('ObjectDetection', device='cuda')

# apply tool
visualization = tool('/root/agent/road.jpg')
print(visualization)

# visualize
image = cv2.imread('/root/agent/road.jpg')

preds = visualization.split('\n')
pattern = r'(\w+) \((\d+), (\d+), (\d+), (\d+)\), score (\d+)'

for pred in preds:
    name, x1, y1, x2, y2, score = re.match(pattern, pred).groups()
```

```
    x1, y1, x2, y2, score = int(x1), int(y1), int(x2), int(y2), int(score)
    cv2.rectangle(image, (x1, y1), (x2, y2), (0, 255, 0), 1)
    cv2.putText(image, f'{name} {score}', (x1, y1), cv2.FONT_HERSHEY_SIMPLEX,
0.8, (0, 255, 0), 1)

cv2.imwrite('/root/agent/road_detection_direct.jpg', image)
```

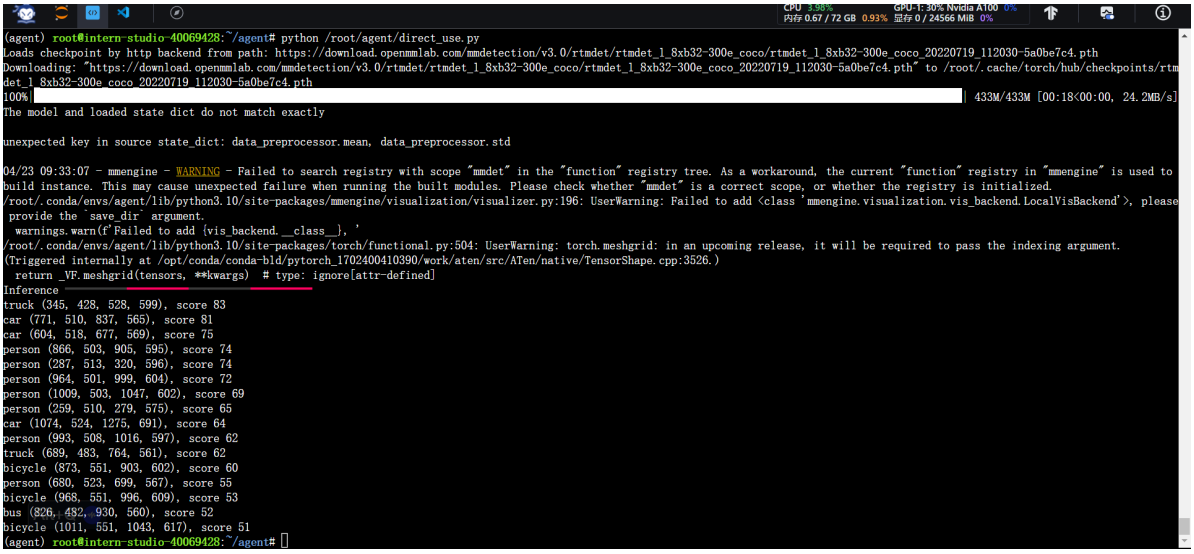


使用第四节的python文件打印agent文件树结构

```
python /root/tree.py /root/agent
```

```
/root/agent
├── agentlego
│   ├── agentlego
│   ├── docs
│   ├── examples
│   ├── LICENSE
│   └── ...
├── lagent
│   ├── docs
│   ├── examples
│   ├── lagent
│   ├── LICENSE
│   └── ...
├── Tutorial
│   ├── assets
│   ├── agent
│   ├── helloword
│   ├── huixiangdou
│   └── ...
├── direct_use.py
└── road.jpg
```

接下来在执行 `python /root/agent/direct_use.py` 以进行推理。在等待 RTMDet-Large 权重下载并推理完成后，可以看到如下输出以及一张位于 /root/agent 名为 road_detection_direct.jpg 的图片：



```
(agent) root@intern-studio-40069428:~/agent# python /root/agent/direct_use.py
Loads checkpoint by http backend from path: https://download.openmmlab.com/mmdetection/v3.0/rtmdet/rtmdet_l_8xb32-300e_coco/rtmdet_l_8xb32-300e_coco_20220719_112030-5a0be7c4.pth
Downloading: "https://download.openmmlab.com/mmdetection/v3.0/rtmdet/rtmdet_l_8xb32-300e_coco/rtmdet_l_8xb32-300e_coco_20220719_112030-5a0be7c4.pth" to /root/.cache/torch/hub/checkpoints/rtm
det_l_8xb32-300e_coco_20220719_112030-5a0be7c4.pth
100%|                                                                                                                                  | 433M/433M [00:18<00:00, 24.2MB/s]
The model and loaded state dict do not match exactly

unexpected key in source state_dict: data_preprocessor.mean, data_preprocessor.std

04/23 09:33:07 - mmengine - WARNING - Failed to search registry with scope "mmdet" in the "function" registry tree. As a workaround, the current "function" registry in "mmengine" is used to
build instance. This may cause unexpected failure when running the built modules. Please check whether "mmdet" is a correct scope, or whether the registry is initialized.
/root/.conda/envs/agent/lib/python3.10/site-packages/mmengine/visualization/visualizer.py:196: UserWarning: Failed to add <class 'mmengine.visualization.vis_backend.LocalVisBackend'>, please
 provide the `save_dir` argument.
  warnings.warn(f"Failed to add {vis_backend.__class__}, "
/root/.conda/envs/agent/lib/python3.10/site-packages/torch/functional.py:504: UserWarning: torch.meshgrid: in an upcoming release, it will be required to pass the indexing argument.
(Triggered internally at /opt/conda/conda-bld/pytorch_1702400410390/work/aten/src/ATen/native/TensorShape.cpp:3526.)
  return _VF.meshgrid(tensors, **kwargs)  # type: ignore[attr-defined]
Inference
truck (345, 428, 528, 599), score 83
car (771, 510, 837, 565), score 81
car (604, 518, 677, 569), score 75
person (866, 503, 905, 595), score 74
person (287, 513, 320, 596), score 74
person (964, 501, 999, 604), score 72
person (1009, 503, 1047, 602), score 69
person (259, 510, 279, 575), score 65
car (1074, 524, 1275, 691), score 64
person (993, 508, 1016, 597), score 62
truck (689, 483, 764, 561), score 62
bicycle (873, 551, 903, 602), score 60
person (680, 523, 699, 567), score 55
bicycle (968, 551, 996, 609), score 53
bus (826, 482, 930, 560), score 52
bicycle (1011, 551, 1043, 617), score 51
(agent) root@intern-studio-40069428:~/agent#
```

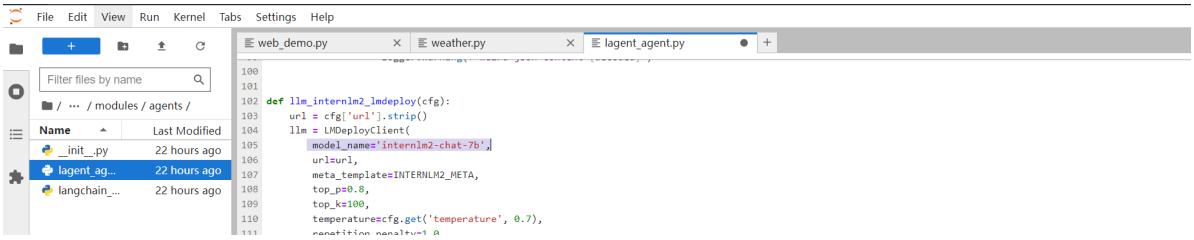
原图

图像检测

2 作为智能体工具使用

2.1 修改相关文件

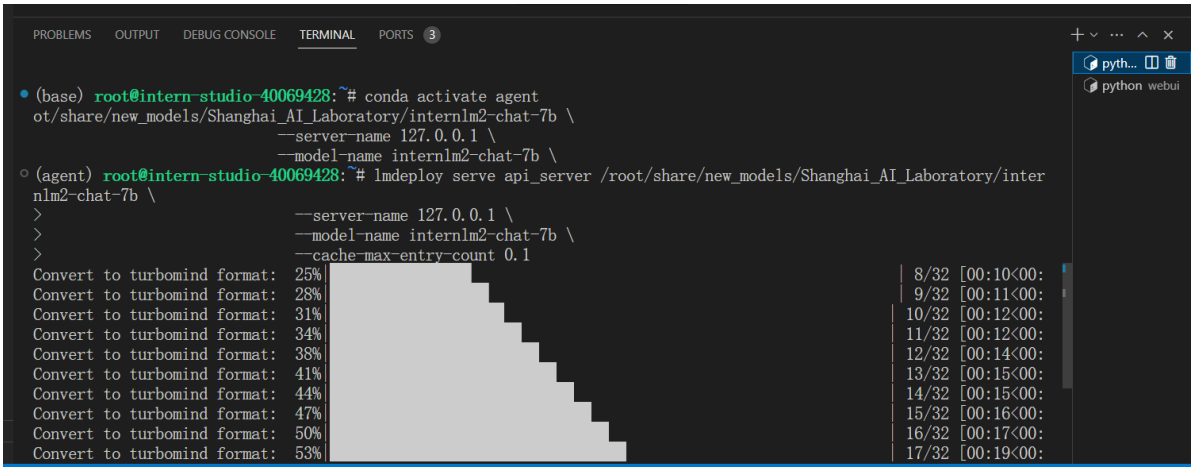
由于 AgentLego 算法库默认使用 InternLM2-Chat-20B 模型，因此我们首先需要修改 /root/agent/agentlego/webui/modules/agents/lagent_agent.py 文件的第 105行位置，将 internlm2-chat-20b 修改为 internlm2-chat-7b，即



2.2 使用 LMDeploy 部署

由于 AgentLego 的 WebUI 需要用到 LMDeploy 所启动的 api_server，因此我们首先按照下图指示在 vscode terminal 中执行如下代码使用 LMDeploy 启动一个 api_server。

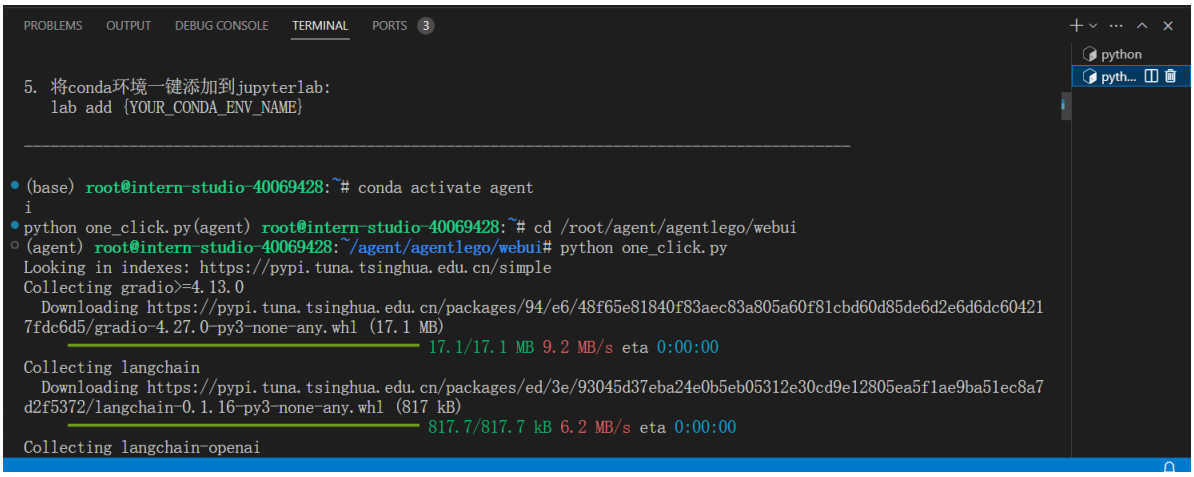
```
conda activate agent
lmdeploy serve api_server
/root/share/new_models/Shanghai_AI_Laboratory/internlm2-chat-7b \
                              --server-name 127.0.0.1 \
                              --model-name internlm2-chat-7b \
                              --cache-max-entry-count 0.1
```



2.3 启动 AgentLego WebUI

新建一个 terminal 以启动 AgentLego WebUI

```
conda activate agent
cd /root/agent/agentlego/webui
python one_click.py
```



等待 LMDeploy 的 api_server 与 AgentLego WebUI 完全启动状态

LMDeploy api_server

AgentLego WebUI

```
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS 3
  Attempting uninstall: requests
    Found existing installation: requests 2.28.2
    Uninstalling requests-2.28.2:
      Successfully uninstalled requests-2.28.2
ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This beha
viour is the source of the following dependency conflicts.
openxlab 0.0.38 requires requests~=2.28.2, but you have requests 2.31.0 which is incompatible.
Successfully installed SQLAlchemy-2.0.29 aiofiles-23.2.1 aiohttp-3.9.5 aiosignal-1.3.1 async-timeout-4.0.3 dataclass
es-json-0.6.4 ffmpy-0.3.2 frozenlist-1.4.1 gradio-4.27.0 gradio-client-0.15.1 greenlet-3.0.3 importlib-resources-6.4
.0 jsonpatch-1.33 langchain-0.1.16 langchain-community-0.0.34 langchain-core-0.1.45 langchain-openai-0.1.3 langchain
-text-splitters-0.0.1 langsmith-0.1.49 marshmallow-3.21.1 multidict-6.0.5 mypy-extensions-1.0.0 openai-1.23.2 orjson
-3.10.1 packaging-23.2 pydub-0.25.1 python-multipart-0.0.9 requests-2.31.0 ruff-0.4.1 semantic-version-2.10.0 shelli
ngham-1.5.4 tomlkit-0.12.0 typer-0.12.3 typing-inspect-0.9.0 urllib3-2.2.1 websockets-11.0.3 yarl-1.9.4
WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system p
ackage manager. It is recommended to use a virtual environment instead: https://pip.pypa.io/warnings/venv
[09:42:23] INFO     Loading tool `Calculator`
Running on local URL:  http://127.0.0.1:7860

To create a public link, set `share=True` in `launch()`.
```

```
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS 4
(base) root@intern-studio-40069428:~# conda activate agent
i
python one_click.py(agent) root@intern-studio-40069428:~# cd /root/agent/agentlego/webui
(agent) root@intern-studio-40069428:~/agent/agentlego/webui# python one_click.py
[17:08:47] INFO     Loading tool `Calculator`
           INFO     Loading tool `ObjectDetection`
Loads checkpoint by http backend from path: https://download.openmmlab.com/mmdetection/v3.0/rtmdet/rtmdet_l_8xb32-30
0e_coco/rtmdet_l_8xb32-300e_coco_20220719_112030-5a0be7c4.pth
The model and loaded state dict do not match exactly

unexpected key in source state_dict: data_preprocessor.mean, data_preprocessor.std

04/23 17:10:17 - mmengine - WARNING - Failed to search registry with scope "mmdet" in the "function" registry tree.
As a workaround, the current "function" registry in "mmengine" is used to build instance. This may cause unexpected
failure when running the built modules. Please check whether "mmdet" is a correct scope, or whether the registry is
initialized.
/root/.conda/envs/agent/lib/python3.10/site-packages/mmengine/visualization/visualizer.py:196: UserWarning: Failed t
o add <class 'mmengine.visualization.vis_backend.LocalVisBackend'>, please provide the `save_dir` argument.
  warnings.warn(f'Failed to add {vis_backend.__class__}, '
Running on local URL:  http://127.0.0.1:7860

To create a public link, set `share=True` in `launch()`.
```

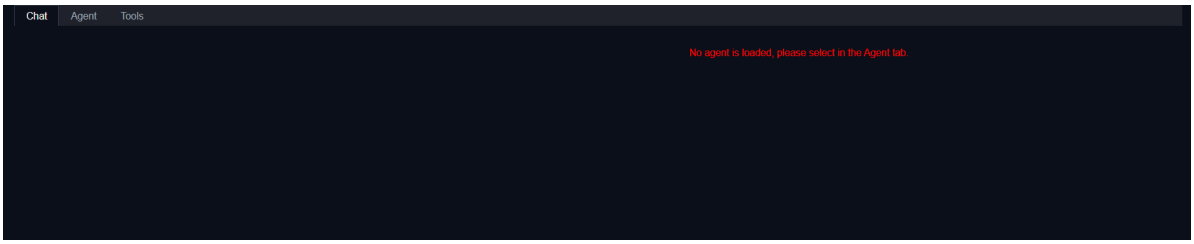
在**本地**进行端口映射，将 LMDeploy api_server 的23333端口以及 AgentLego WebUI 的7860端口映射到本地

```
C:\Windows\System32\OpenSSH\ssh -CNg -L 7860:127.0.0.1:7860 -L
23333:127.0.0.1:23333 root@ssh.intern-ai.org.cn -p 44841
```

2.4 使用 AgentLego WebUI

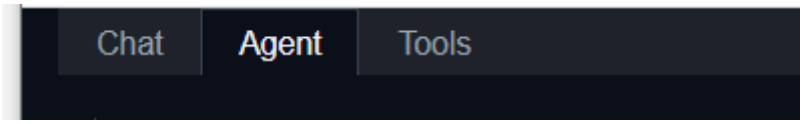
接下来在本地的浏览器页面中打开 http://localhost:7860 以使用 AgentLego WebUI。

初始状态

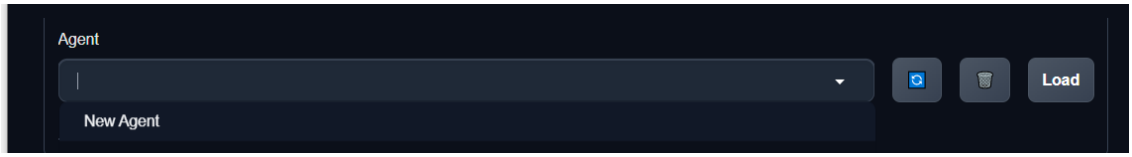


配置 Agent，按照以下步骤。

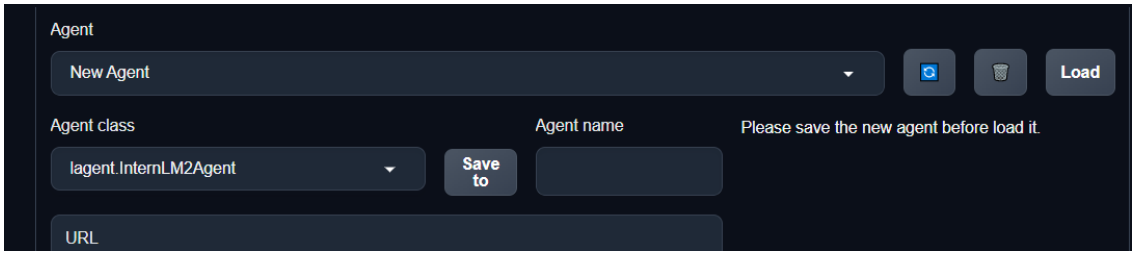
1. 点击上方 Agent 进入 Agent 配置页面。



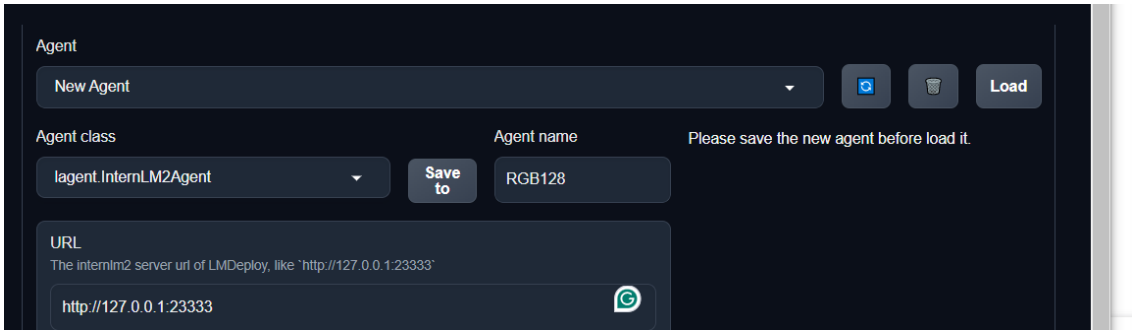
2. 点击 Agent 下方框，选择 New Agent。



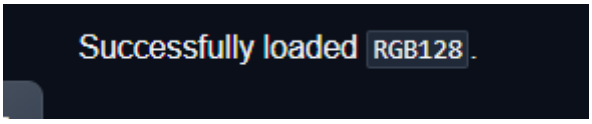
3. 选择 Agent Class 为 lagent.InternLM2Agent。



4. 输入模型 URL 为 http://127.0.0.1:23333 。
5. 输入 Agent name，自定义即可，图中输入了RGB128

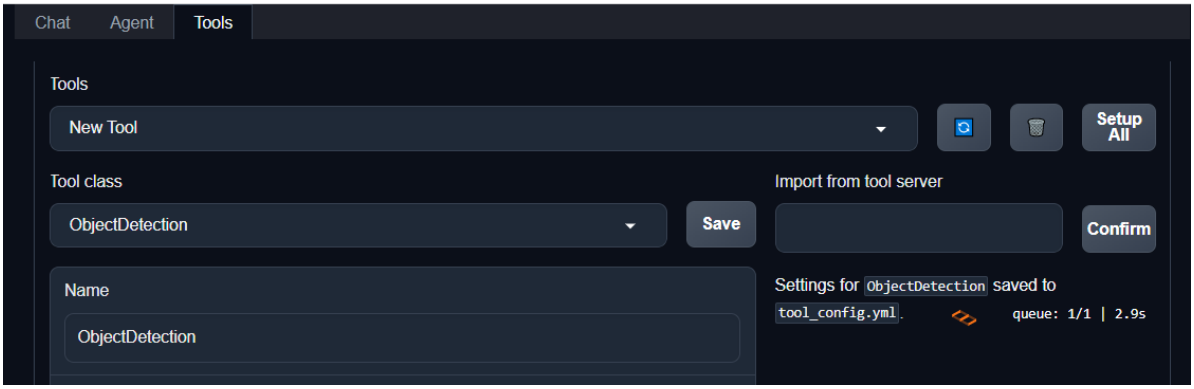


6. 点击 save to 以保存配置，这样在下次使用时只需在第2步时选择 Agent 为 internlm2 后点击 load 以加载就可以了。
7. 点击 load 以加载配置。



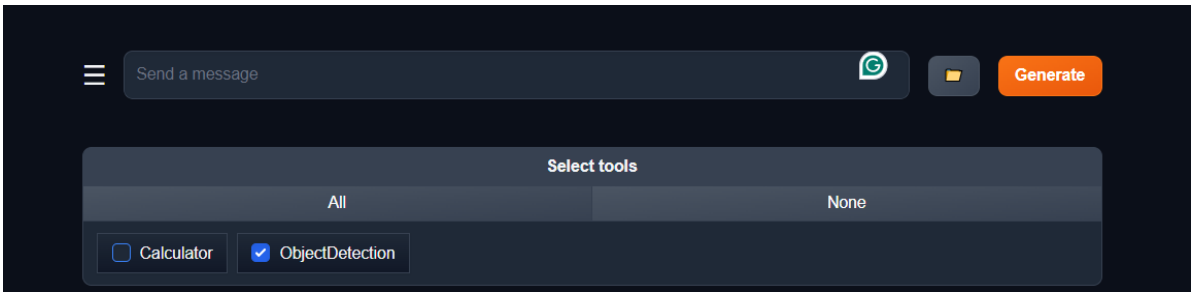
然后配置工具，如下图所示。

1. 点击上方 Tools 页面进入工具配置页面。（如①所示）
2. 点击 Tools 下方框，选择 New Tool 以加载新工具。（如②所示）
3. 选择 Tool Class 为 ObjectDetection。（如③所示）
4. 点击 save 以保存配置。（如④所示）



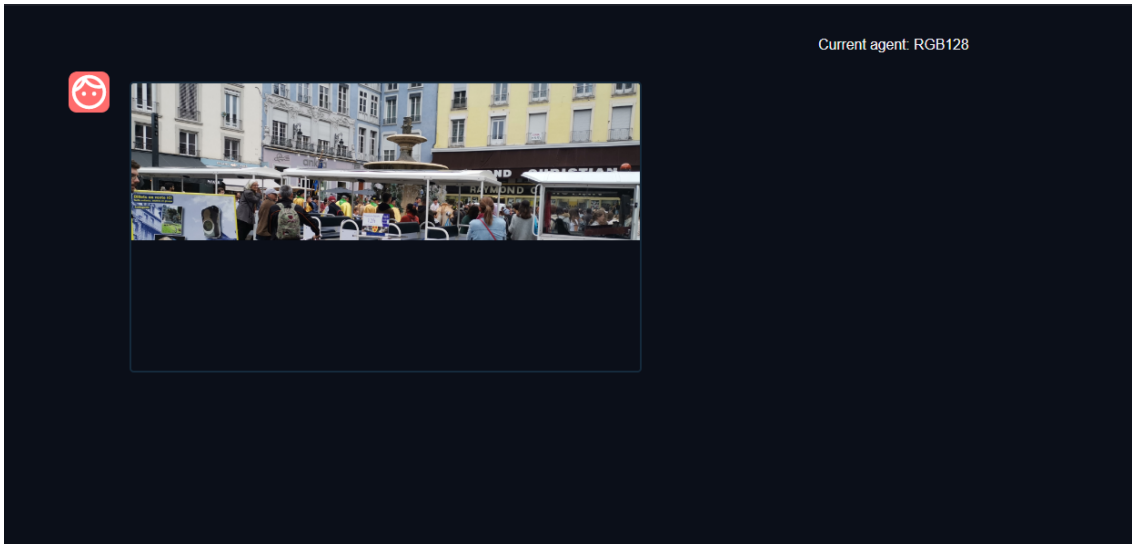
等待工具加载完成

点击上方 Chat 以进入对话页面。在页面下方选择工具部分只选择 ObjectDetection 工具，如下图所示。为了确保调用工具的成功率，请在使用时确保仅有这一个工具启用。



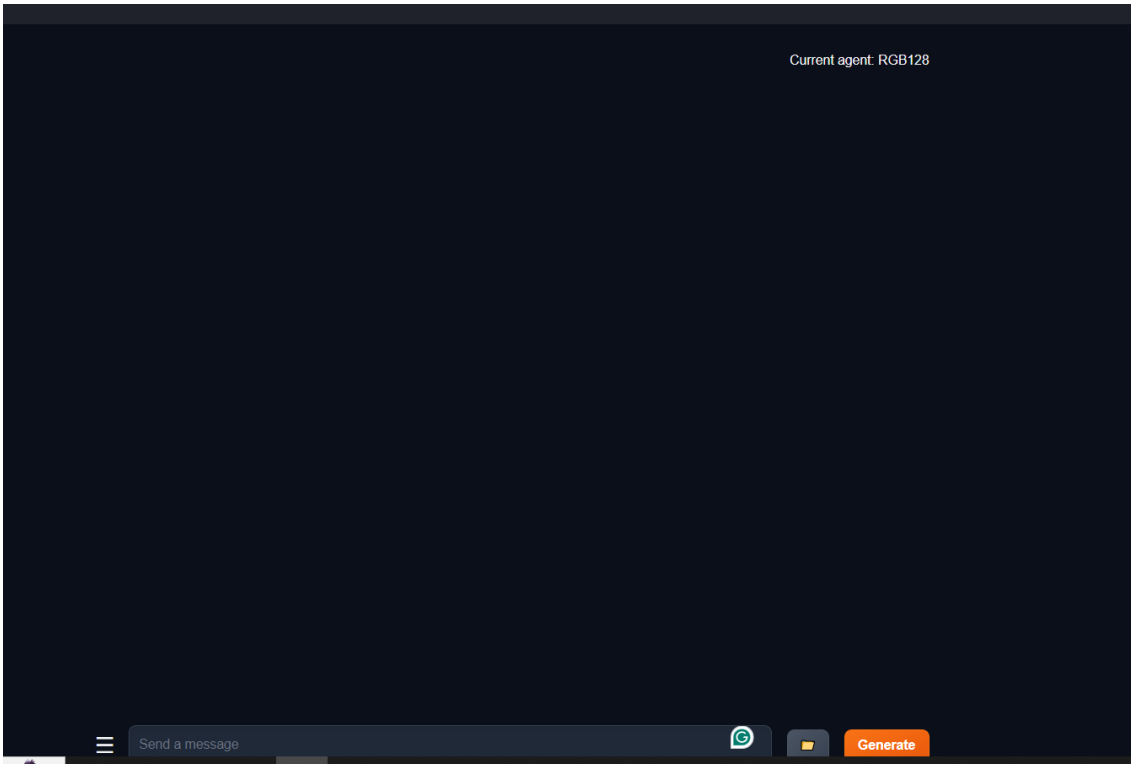
点击右下角文件夹以上传图片，点击 generate 以得到模型回复。如下图所示

观察：

- 刷新响应非常慢
- 刷新后需要重新选择ools配置
- 上传图片加载过久
- 

- 无法判定是否上传了重复文件（第一张图片上传10秒没有响应，尝试再次上传）
- 

- 点击生成按钮无响应（上传图片被清除）

- 

3. 用 AgentLego 自定义工具

在本节中，我们将基于 AgentLego 构建自己的自定义工具。AgentLego 在这方面提供了较为详尽的文档，文档地址为 https://agentlego.readthedocs.io/zh-cn/latest/modules/tool.html 。自定义工具主要分为以下几步：

1. 继承 BaseTool 类
2. 修改 default_desc 属性（工具功能描述）
3. 如有需要，重载 setup 方法（重型模块延迟加载）
4. 重载 apply 方法（工具功能实现）

其中第一二四步是必须的步骤。下面我们将实现一个调用 MagicMaker 的 API 以实现图像生成的工具。

MagicMaker 是汇聚了优秀 AI 算法成果的免费 AI 视觉素材生成与创作平台。主要提供图像生成、图像编辑和视频生成三大核心功能，全面满足用户在各种应用场景下的视觉素材创作需求。体验更多功能可以访问 https://magicmaker.openxlab.org.cn/home 。

3.1 创建工具文件

首先通过 `touch /root/agent/agentlego/agentlego/tools/magicmaker_image_generation.py`（大小写敏感）的方法新建工具文件。该文件的内容如下：

```
import json
import requests

import numpy as np

from agentlego.types import Annotated, ImageIO, Info
from agentlego.utils import require
from .base import BaseTool


class MagicMakerImageGeneration(BaseTool):
```

```
    default_desc = ('This tool can call the api of magicmaker to '
                    'generate an image according to the given keywords.')

    styles_option = [
        'dongman',  # 动漫
        'guofeng',  # 国风
        'xieshi',   # 写实
        'youhua',   # 油画
        'manghe',   # 盲盒
    ]
    aspect_ratio_options = [
        '16:9', '4:3', '3:2', '1:1',
        '2:3', '3:4', '9:16'
    ]

    @require('opencv-python')
    def __init__(self,
                 style='guofeng',
                 aspect_ratio='4:3'):
        super().__init__()
        if style in self.styles_option:
            self.style = style
        else:
            raise ValueError(f'The style must be one of {self.styles_option}')

        if aspect_ratio in self.aspect_ratio_options:
            self.aspect_ratio = aspect_ratio
        else:
            raise ValueError(f'The aspect ratio must be one of {aspect_ratio}')

    def apply(self,
              keywords: Annotated[str,
                                  Info('A series of Chinese keywords separated by
comma.')]
        ) -> ImageIO:
        import cv2
        response = requests.post(
            url='https://magicmaker.openxlab.org.cn/gw/edit-
anything/api/v1/bff/sd/generate',
            data=json.dumps({
                "official": True,
                "prompt": keywords,
                "style": self.style,
                "poseT": False,
                "aspectRatio": self.aspect_ratio
            }),
            headers={'content-type': 'application/json'}
        )
        image_url = response.json()['data']['imgUrl']
        image_response = requests.get(image_url)
        image = cv2.imdecode(np.frombuffer(image_response.content, np.uint8),
cv2.IMREAD_COLOR)
        return ImageIO(image)
```

3.2 注册新工具

接下来修改 /root/agent/agentlego/agentlego/tools/**init**.py 文件，将我们的工具注册在工具列表中。如下所示，我们将 MagicMakerImageGeneration 通过 from .magicmaker_image_generation import MagicMakerImageGeneration 导入到了文件中，并且将其加入了 **all** 列表中。

```
from .base import BaseTool
from .calculator import Calculator
from .func import make_tool
from .image_canny import CannyTextToImage, ImageToCanny
from .image_depth import DepthTextToImage, ImageToDepth
from .image_editing import ImageExpansion, ImageStylization, ObjectRemove,
ObjectReplace
from .image_pose import HumanBodyPose, HumanFaceLandmark, PoseToImage
from .image_scribble import ImageToScribble, ScribbleTextToImage
from .image_text import ImageDescription, TextToImage
from .imagebind import AudioImageToImage, AudioTextToImage, AudioToImage,
ThermalToImage
from .object_detection import ObjectDetection, TextToBbox
from .ocr import OCR
from .scholar import *  # noqa: F401, F403
from .search import BingSearch, GoogleSearch
from .segmentation import SegmentAnything, SegmentObject, SemanticSegmentation
from .speech_text import SpeechToText, TextToSpeech
from .translation import Translation
from .vqa import VQA
+ from .magicmaker_image_generation import MagicMakerImageGeneration

__all__ = [
    'CannyTextToImage', 'ImageToCanny', 'DepthTextToImage', 'ImageToDepth',
    'ImageExpansion', 'ObjectRemove', 'ObjectReplace', 'HumanFaceLandmark',
    'HumanBodyPose', 'PoseToImage', 'ImageToScribble', 'ScribbleTextToImage',
    'ImageDescription', 'TextToImage', 'VQA', 'ObjectDetection', 'TextToBbox',
'OCR',
    'SegmentObject', 'SegmentAnything', 'SemanticSegmentation',
'ImageStylization',
    'AudioToImage', 'ThermalToImage', 'AudioImageToImage', 'AudioTextToImage',
    'SpeechToText', 'TextToSpeech', 'Translation', 'GoogleSearch', 'Calculator',
-     'BaseTool', 'make_tool', 'BingSearch'
+     'BaseTool', 'make_tool', 'BingSearch', 'MagicMakerImageGeneration'
]
```

```
from .segmentation import SegmentAnything, SegmentObject, SemanticSegmentation
from .speech_text import SpeechToText, TextToSpeech
from .translation import Translation
from .vqa import VQA
from .magicmaker_image_generation import MagicMakerImageGeneration

__all__ = [
    'CannyTextToImage', 'ImageToCanny', 'DepthTextToImage', 'ImageToDepth',
    'ImageExpansion', 'ObjectRemove', 'ObjectReplace', 'HumanFaceLandmark',
    'HumanBodyPose', 'PoseToImage', 'ImageToScribble', 'ScribbleTextToImage',
    'ImageDescription', 'TextToImage', 'VQA', 'ObjectDetection', 'TextToBbox', 'OCR',
    'SegmentObject', 'SegmentAnything', 'SemanticSegmentation', 'ImageStylization',
    'AudioToImage', 'ThermalToImage', 'AudioImageToImage', 'AudioTextToImage',
    'SpeechToText', 'TextToSpeech', 'Translation', 'GoogleSearch', 'Calculator',
-     'BaseTool', 'make_tool', 'BingSearch'
+     'BaseTool', 'make_tool', 'BingSearch', 'MagicMakerImageGeneration'
]
```

3.3 体验自定义工具效果

与2.2，2.3以及2.4节类似，我们在两个 terminal 中分别启动 LMDeploy 服务和 AgentLego 的 WebUI 以体验我们自定义的工具的效果。

Important

注意，确保 2.2 节中的 LMDeploy 服务以及 2.3 节中的 Web Demo 服务已经停止（即 terminal 已关闭），否则会出现 CUDA Out of Memory 或是端口已占用的情况！

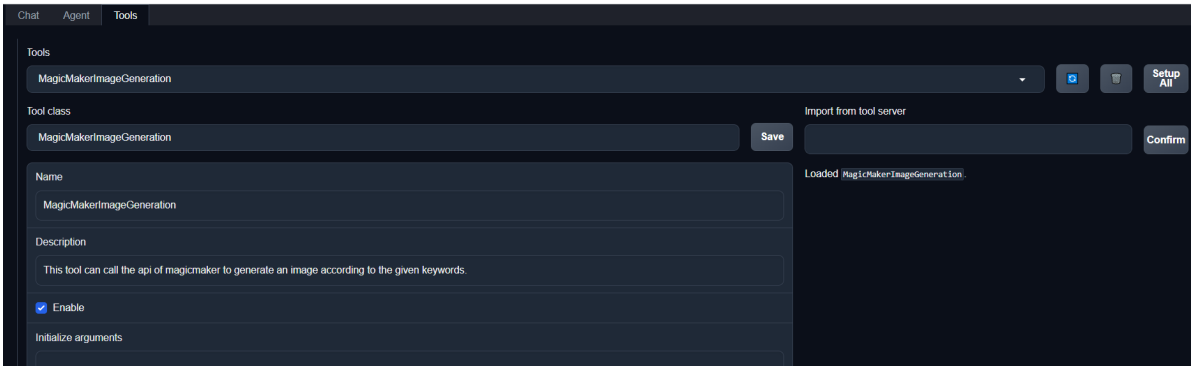
```
conda activate agent
lmdeploy serve api_server
/root/share/new_models/Shanghai_AI_Laboratory/internlm2-chat-7b \
                            --server-name 127.0.0.1 \
                            --model-name internlm2-chat-7b \
                            --cache-max-entry-count 0.1
```

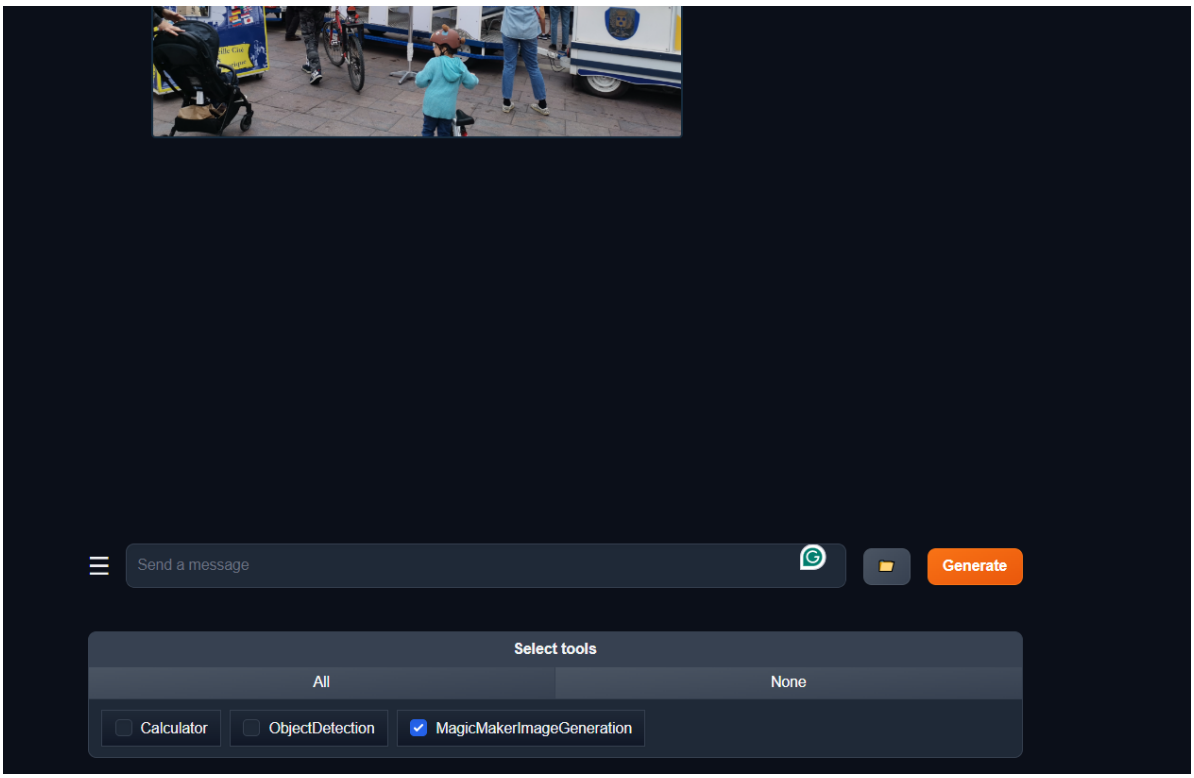
```
conda activate agent
cd /root/agent/agentlego/webui
python one_click.py
```

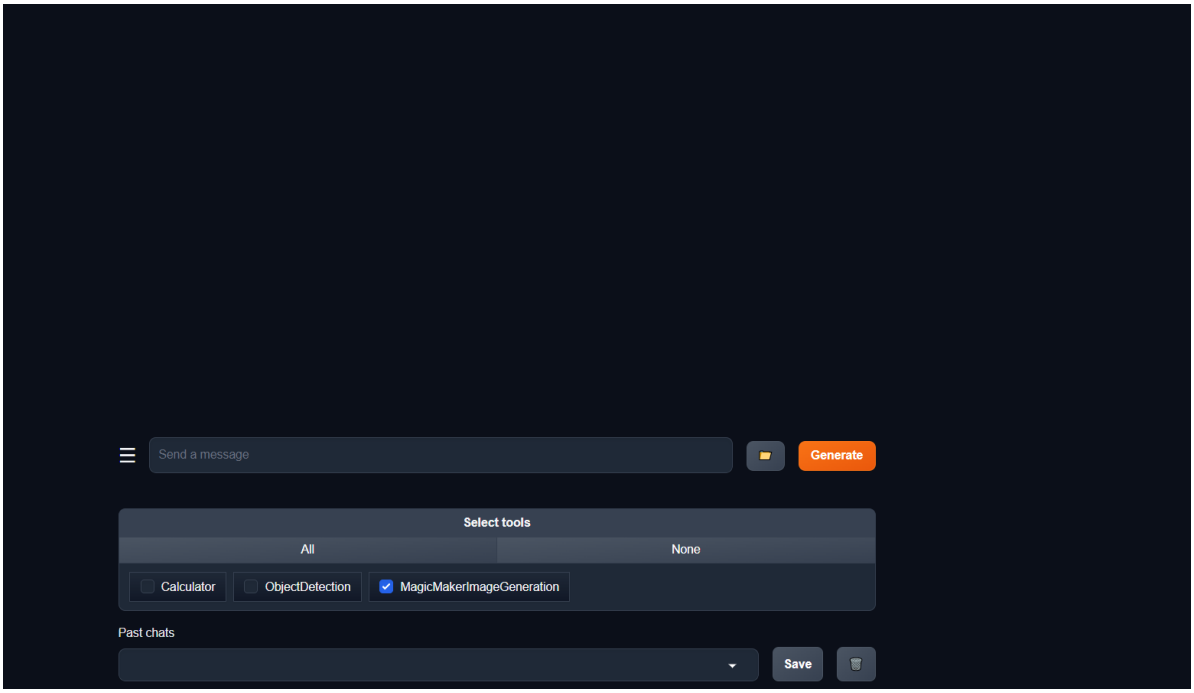
并在**本地**执行如下操作以进行端口映射：

```
C:\Windows\System32\OpenSSH\ssh -CNg -L 7860:127.0.0.1:7860 -L
23333:127.0.0.1:23333 root@ssh.intern-ai.org.cn -p 44841
```

在 Tool 界面选择 MagicMakerImageGeneration 后点击 save 后，回到 Chat 页面选择 MagicMakerImageGeneration 工具后就可以开始使用了。为了确保调用工具的成功率，请在使用时确保仅有这一个工具启用。下图是一个例子。可以看到模型成功地调用了工具并得到了结果。


Chat
Agent
Tools
Tools
MagicMakerImageGeneration
Setup All
Tool class
MagicMakerImageGeneration
Save
Import from tool server
Confirm
Name
MagicMakerImageGeneration
Loaded MagicMakerImageGeneration.
Description
This tool can call the api of magicmaker to generate an image according to the given keywords.
Enable
Initialize arguments


Send a message
Generate
Select tools
All
None
Calculator
ObjectDetection
MagicMakerImageGeneration


Send a message
Generate
Select tools
All
None
Calculator
ObjectDetection
MagicMakerImageGeneration
Past chats
Save

进阶作业

1.完成 AgentLego WebUI 使用（已完成）

文档可见 AgentLego WebUI

具体步骤详见 B.AgentLego 2.4 小节

2.使用 Lagent 或 AgentLego 实现自定义工具并完成调用

- 用 Lagent 自定义工具
- 用 AgentLego 自定义工具 （已完成）

  具体步骤详见 B.AgentLego 3.3小节

大作业选题

算法方向

1. 在 Lagent 或 AgentLego 中实现 RAG 工具，实现智能体与知识库的交互。
2. 基于 Lagent 或 AgentLego 实现工具的多轮调用，完成复杂任务。如：智能体调用翻译工具，再调用搜索工具，最后调用生成工具，完成一个完整的任务。
3. ...

应用方向

1. 基于 Lagent 或 AgentLego 实现一个客服智能体，帮助用户解决问题。
2. 基于 Lagent 或 AgentLego 实现一个智能体，实现艺术创作，如生成图片、视频、音乐等。
3. ...