

大模型竞赛考试程序

2025年1月31日

注意事项

- 考试日期：2025年2月15日全天
- 考试通过在服务器API调用进行（无法连接外网）
- 参加考试的每组将被分配一个唯一的时间段和GPU
- 每组考试时间30分钟，含调试时间。过时不候
- 每组只有一次作答机会
- 作答方式：每组在指定时间内开启openAI相容的API端口。考官通过调用程序向端口提问并记录答案。答题中间步骤不计入分数。

考前程序调试

- 在服务器上启动openAI API服务。以vllm为例：

创建vllm环境并安装之

```
conda create -n vllm python=3.11  
pip install vllm
```

```
(vllm) → vllm vllm serve /data/konformal/nn/model/Qwen2.5-14B --port 3030
```

你参与考试的模型存放位置

为防止端口冲突，请指定
一个不常见端口

命令行查看API端点运行情况

模型名字

```
(base) → LLM_competition curl -X GET http://127.0.0.1:3030/v1/models  
{  
  "object": "list",  
  "data": [  
    {  
      "id": "/data/konformal/nn/model/Qwen2.5-14B",  
      "object": "model",  
      "created": 1738335826,  
      "owned_by": "vllm",  
      "root": "/data/konformal/nn/model/Qwen2.5-14B",  
      "parent": null,  
      "max_model_len": 131072,  
      "permission": [  
        {  
          "id": "modelperm-3aa2205c8d714aec99d400571b7087a9",  
          "object": "model_permission",  
          "created": 1738335826,  
          "allow_create_engine": false,  
          "allow_sampling": true,  
          "allow_logprobs": true,  
          "allow_search_indices": false,  
          "allow_view": true,  
          "allow_fine_tuning": false,  
          "organization": "*",  
          "group": null,  
          "is_blocking": false  
        }  
      ]  
    }  
  ]  
}
```

考前程序调试

- 建立一个目录并将考试程序和测试题样例复制到此

```
(base) → LLM_competition ls  
llm_solve_problem.py  test_problem.json
```

考前程序调试

- 修改llm_solve_problem.py中的对应内容
- 考试前将修改后的llm_solve_problem.py发给监考老师。
具体由哪位老师与你对接将在考前通知

```
1  from openai import OpenAI
2  import json
3
4  api_base = "http://127.0.0.1:3030/v1" 改成你的端口!
5  api_key = "dummy_key"
6  model_name = "data/konformal/nn/model/Qwen2.5-14B" 改成你的模型名称!
7  problem_set = "test_problem.json"
8  group_num = "001" 改成你的组号!
9
10 client = OpenAI(
11     base_url=api_base,
12     api_key=api_key,
13 )
14
15 def predict(message):
16     response = client.chat.completions.create(
17         model=model_name,
18         messages=[
19             {'role': 'user', 'content': message}],
20         max_tokens=8196,
21         temperature=0.5, 调用参数可酌情修改
22         stream=False
23     )
24     return response.choices[0].message.content
25
26
27 if __name__ == "__main__":
28     with open(problem_set, 'r', encoding='utf-8') as file:
29         data = json.load(file)
30
31     for i in range(len(data)):
32         problem = data[i]["problem"]
33         print(f"Working on problem {i}.")
34         answer = predict(problem)
35         print(f"problem {i} done!")
36         data[i]["answer"] = answer
37
38     with open(f'Answer_{group_num}.json', 'w', encoding='utf-8') as file:
39         json.dump(data, file, ensure_ascii=False, indent=4)
```


考前程序调试

- ## • 运行程序测试作答情况

```
(vllm) → LLM_competition python llm_solve_problem.py
Working on problem 0
problem 0 done!
Working on problem 1
problem 1 done!
Working on problem 2
problem 2 done!
Working on problem 3
problem 3 done!
Working on problem 4
problem 4 done!
Working on problem 5
problem 5 done!
Working on problem 6
problem 6 done!
Working on problem 7
problem 7 done!
Working on problem 8
problem 8 done!
```

- 打开作答结果检查是否有答案输出

```
vim Answer_001.json
```

```

{
    "problem": "Find the potential outside a charged metal sphere (charge $Q$, r  
adius $R$) placed in an otherwise uniform electric field $E_0$.",
    "answer": "To find the potential outside a charged metal sphere with charge  
\\( Q \\) and radius \\( R \\), placed in an otherwise uniform electric field \\( E_0 \\), we can use the method of images. This involves placing an image charge inside  
the sphere such that the boundary conditions are satisfied.\\n\\n### Step-by-Step Solu  
tion:\\n\\n1. **Identify Boundary Conditions:**\\n    - The potential on the surface of  
the sphere must be constant and equal to the potential due to the charge \\( Q \\)  
and the uniform electric field \\( E_0 \\).\\n    - The potential at infinity must be  
zero.\\n\\n2. **Set Up the Problem:**\\n    - Place the sphere at the origin of a coordi  
nate system.\\n    - The uniform electric field \\( E_0 \\) points along the z-axis.\\n\\n3. **Use Method of Images:**\\n    - Place an image charge \\( Q' \\) inside the sphere at  
a distance \\( d \\) from the center along the z-axis.\\n    - The image charge  
\\( Q' \\) should be chosen such that the potential on the surface of the sphere is  
constant.\\n\\n4. **Determine the Image Charge:**\\n    - The potential on the surface  
of the sphere due to the charge \\( Q \\) and the image charge \\( Q' \\) must equal  
the potential due to the uniform electric field \\( E_0 \\).\\n    - The potential du  
e to the charge \\( Q \\) at the surface of the sphere is \\( kQ / R \\).\\n    - The  
potential due to the image charge \\( Q' \\) at the surface of the sphere is \\( kQ' / \\sqrt{R^2 + d^2} \\).\\n    - The potential due to the uniform electric field \\( E_0 \\)  
at the surface of the sphere is \\( E_0 R \\).\\n\\n    Therefore, we have:\\n    \\[\\n    \\frac{kQ}{R} + \\frac{kQ'}{\\sqrt{R^2 + d^2}} = E_0 R\\n    \\]\\n\\n5. **Solv  
e for \\( Q' \\) and \\( d \\):**\\n    - Rearrange the equation to solve for \\( Q' \\):\\n    \\[\\n    \\frac{kQ'}{\\sqrt{R^2 + d^2}} = E_0 R - \\frac{kQ}{R}\\n    \\]\\n    \\[\\n    Q' = \\left( E_0 R - \\frac{kQ}{R} \\right) \\frac{\\sqrt{R^2 + d^2}}{k}\\n    \\]\\n    - To satisfy the boundary condition, we need to choose \\( d \\)  
and \\( Q' \\) such that the potential on the surface of the sphere is constant.  
This typically involves solving a transcendental equation, which can be done numeric  
ally or through iterative methods.\\n\\n6. **Write the General Potential Expression:**\\n    - The potential outside the sphere can be written as the sum of the potentials  
due to the charge \\( Q \\), the image charge \\( Q' \\), and the uniform electric f  
ield \\( E_0 \\):\\n    \\[\\n    V(r, \\theta) = \\frac{kQ}{r} + \\frac{kQ'}{\\sqrt{r^2 + d^2 - 2rd\\cos\\theta}} + E_0 z\\n    \\]\\n    where \\( r \\) is the radial  
distance from the center of the sphere, \\( \\theta \\) is the polar angle, and \\( z = r \\cos\\theta \\).\\n\\n### Final Answer:\\n    The potential outside the charged met  
al sphere is given by:\\n    \\[\\n    V(r, \\theta) = \\frac{kQ}{r} + \\frac{kQ'}{\\sqrt{r^2 + d^2 - 2rd\\cos\\theta}} + E_0 z\\n    \\]\\n    where \\( Q' \\) and \\( d \\) are determine  
d by the boundary conditions and the specific geometry of the problem."
}
}

```

考试愉快！