复试

英语面试（2+3=5分钟）

自我介绍（2分钟）

Good morning teachers, I am very glad to be here for this interview.
First of all, let me introduce myself. My name is Deng Xiaoyi. I am studying in SouthWest JaoTong University, majoring in Computer Sicence and Technology. Although my undergraduate school is not well know, I still appreciate it, because it offers me a chance to develop my abilities. During the past four years, I have learned a lot of professional knowledge and practical skills. But gradually, I realized it is not enough. In my opinion, further study is actually urgent, especially in the competitive modern society. It is necessary to catch any opportunity for self-development. Therefore, I choose to go on for further education.
If luckily, I got the chance to learn SE in USTC, I will concentrate on the study and research in this field. And I believe after 3 years of learning, I will make greater progress.

英文问答（3分钟）

1. Where are you come from?

My hometown is a small town located in Wenzhou, Zhejiang province. It is known for its entrepreneurship, handicrafts, and cuisine. Besides, the people here are very kind and hospitable.

2. Could you tell me something about your family?

My family has 3 people ,my mother, my father and me. My mother is beautiful and she is good at cooking. My father sometimes looks serious in his face but he is a very kind man actually.

3. What is your major? How do you like your major?

My major is CS, With the development of our country, computer is playing a more and more important role in the society. No matter our cellphones or TVs now, they are all full of system and software knowledge and I hope I could make some achievements in this field.

4. What impressed you most when you were at university?

Each time I come to the library, I find hundreds of students are study hard. It makes me impressed most because the hardworking students always remind me what I should do.

5. What is the best university in your opinion?

In my opinion, the best university should like this. For one thing, the teachers should be full of knowledge and experience so that they can guide the students well in learning progress. For another, the university should be equipped with enough experimental facilities for scientific research.

6. What are your job prospects

If possible, I will go to work in Hangzhou. Because I think Hangzhou is a beautiful and dynamic city with a lot of opportunities and potential, especially for us young people.

7. What are your spare time interests?

I like reading books in my spare time, especially the science fiction. In my opinion, the most interesting book is 《three bodies》.And it impressed me a lot for a long time.

8. Why did you choose our university?

For one thing, USTC is famous in the whole world because of its professional teachers and strong academic atmosphere. I believe that I could learn many things here. For another reason, I think the Chinese name of USTC sounds very cool and I like it very much.

9. What is your greatest strength?

I have the ability to stick to things to get them done. I feel a real sense of accomplishment when I finish a job and it turns out just as I had planned.

10. What is your weakness?

Sometimes I think I am not as outgoing as I want, but luckily, I have realized this problem and I will try my best to get over it.

11. Why do you want to take an examination of graduate school?

With the in-depth understanding my professional courses, I increasingly feel that knowledge is endless, and I realize that what I have learned is only the tip of the iceberg. Therefore, with the idea of further study, I hope to master as much professional knowledge as possible, in order to better play my value in the society.

12. introduce your graduate design

> My graduate design is about the design and implementation of project cost doucument management and retrieval system about based on microservice architecture. Realize project cost documents retrieval, display, and download functions

13. Which subjects do you like best?

> Computer graphics is my favourite subject, because this course is very interesting, and it shows the principles of many movie and game implementations.
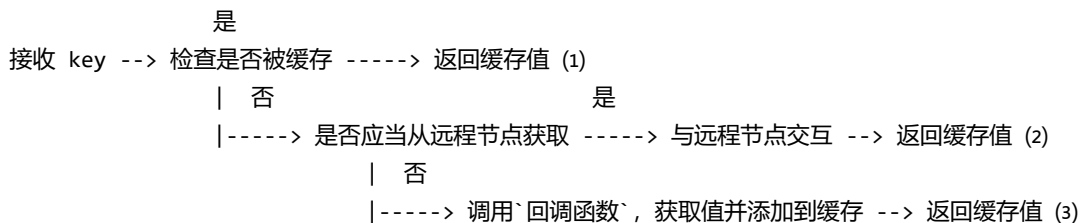
项目介绍

分布式缓存项目

简介

模仿groupcache的实现，支持：

1. 单机缓存和基于HTTP的分布式缓存
2. 采用LRU（Least Recently Used，最近最少访问）缓存淘汰机制
3. 使用Go锁机制防止缓存击穿
4. 使用一致性哈希选择节点，实现负载均衡

运行流程

```
                    是
接收 key --> 检查是否被缓存 -----> 返回缓存值 (1)
              |  否                        是
              |-----> 是否应当从远程节点获取 -----> 与远程节点交互 --> 返回缓存值 (2)
                          |  否
                          |-----> 调用`回调函数`，获取值并添加到缓存 --> 返回缓存值 (3)
```

LRU缓存淘汰策略

LRU认为，如果数据最近被访问过，那么将来被访问的概率也会更高。

数据结构

LRU算法的核心数据结构有一个hash字典和一个双向链表组成。

- 字典存储键和值的映射关系，通过键值映射到双向链表的结点。

- 双向链表实现缓存值队列，当访问到某个值时，将其移动到队列尾部。当缓存数量超过队列容量时，删除队列头部的记录。

分布式结点负载均衡

使用一致性哈希算法解决分布式缓存选择节点的问题

- 使用哈希计算，对于给定的key值，每次都选择同一个结点
- 一致性哈希算法将key值映射到其值域范围的空间上，将数字首位相连，形成一个环。将结点的哈希值放置在环上；计算key的哈希值，在环上顺时针寻找第一个结点，就是所要选取的结点。
- 一致性哈希算法可以解决结点故障时的缓存雪崩问题。
- 对于数据倾斜问题，可以增加虚拟节点，将选择的虚拟节点映射到真实节点。

使用Go锁机制防止缓存击穿

- 对于相同的key值，向节点发起多次相同的请求，会增加数据库的负担。
- 因此，对于第一次key值的请求，利用Go的waitgroup锁机制，在发起请求前加锁，实际增加等待队列数量。如果存在相同请求，则阻塞该请求，直到锁被释放。
- 当锁释放时，对于阻塞的请求，都可以返回相同的缓存值，不必再向数据库发起请求，防止了缓存击穿的发生。