17625-A3-gRPC

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Assignment: A3-gRPC

Language:Python

github-link:https://github.com/tongliu1234/17625-A3-gRPC

1. Protocol Buffer definitions

1. User

```
message User {
  string user_id = 1;
}
```

2. Post

```
message Post {
  string title = 1;
  string text = 2;
  string video_url = 3;
  string image_url = 4;
  string author = 5;
  int32 score = 6;
  enum State {
    NORMAL = 0;
    LOCKED = 1;
    HIDDEN = 2;
  }
  State post_state = 7;
  int64 publication_date = 8;
  string post_id = 9;
}
```

3. Comment

```
message Comment {
  string text = 1;
  string author = 2;
  int32 score = 3;
  enum State {
    NORMAL = 0;
    HIDDEN = 1;
  }
  State comment_state = 4;
  int64 publication_date = 5;
  string comment_id = 6;
  string parent_post_id = 7;
  st
```

4. **Subreddit**(Extra Credit)

```
message Subreddit {
  string name = 1;
  enum Visibility {
    PUBLIC = 0;
    PRIVATE = 1;
    HIDDEN = 2;
  }
  Visibility visibility = 2;
  repeated string tags = 3;
}
```

5. Reddit

```
message PostRequest {
  string post_id = 1;
}

message PostResponse {
  repeated Post posts = 1;
}

message CommentRequest {
  string comment_id = 1;
}

message CommentResponse {
```

```
  repeated Comment comments = 1;
}

message PostRequest2 {
  string post_id = 1;
  string n = 2;
}

message UpvotedCommentsResponse {
  repeated Comment upvoted_comments = 1;
}

message CommentBranchRequest {
  string comment_id = 1;
  int32 n = 2;
}

message CommentBranchResponse {
  repeated CommentThread comment_threads = 1;

  message CommentThread {
    Comment main_comment = 1;
    repeated Comment replies = 2;
  }
}

message UpdatesRequest {
  string post_id = 1;
  repeated string comment_ids = 2;
}

message UpdatesResponse {
  int32 post_score = 1;
  repeated CommentUpdate comment_updates = 2;

  message CommentUpdate {
    string comment_id = 1;
    int32 score = 2;
  }
}
```

2. Service definitions

```
service RedditService {
  rpc CreatePost(Post) returns (Post);
  rpc UpvotePost(PostRequest) returns (Post);
  rpc DownvotePost(PostRequest) returns (Post);
  rpc RetrieveAllPosts(PostRequest) returns (PostResponse);
  rpc RetrievePostContent(PostRequest) returns (Post);
  rpc CreateComment(Comment) returns (Comment);
  rpc UpvoteComment(CommentRequest) returns (Comment);
  rpc DownvoteComment(CommentRequest) returns (Comment);
  rpc RetrieveAllComments(PostRequest) returns (CommentResponse);
  rpc RetrieveUpvotedComments(PostRequest2) returns (UpvotedCommentsResponse);
  rpc ExpandCommentBranch(CommentBranchRequest) returns (CommentBranchResponse);

  // Extra Credit
  rpc MonitorUpdates(UpdatesRequest) returns (stream UpdatesResponse);
}
```

3.Storage backend

A straightforward in-memory storage approach is employed as the backend for storing entities such as posts, comments, users, and potentially subreddits. The in-memory storage is designed to be simple and suitable for test purposes, as specified in the assignment. Entities are stored within Python dictionaries, where each entity type corresponds to a separate dictionary. This choice facilitates rapid development and testing, as it allows for quick retrieval and manipulation of data during API service interactions.

4.Links

Server: https://github.com/tongliu1234/17625-A3-gRPC/blob/main/server.py

Client: https://github.com/tongliu1234/17625-A3-gRPC/blob/main/client.py

Mock_object: https://github.com/tongliu1234/17625-A3-gRPC/blob/main/mock_object.py

Test_high_level_func: https://github.com/tongliu1234/17625-A3-gRPC/blob/main/test_high_level_func.py

Proto: https://github.com/tongliu1234/17625-A3-gRPC/blob/main/Reddit.proto

Backend-storage:https://github.com/tongliu1234/17625-A3-gRPC/blob/main/dummy_data.py

5. Extra Credit

1. Data Model(5pts)

   Subreddit - note that this portion will require changing other PBs (Post, at the very least)
   ○ Subreddits have a human-readable name
   ○ Posts belong to exactly one subreddit
   ○ Subreddits can be public, private, or hidden
   ○ Subreddits can define a set of tags that are attached to posts

```
message Subreddit {
  string name = 1;
  enum Visibility {
    PUBLIC = 0;
    PRIVATE = 1;
    HIDDEN = 2;
  }
  Visibility visibility = 2;
  repeated string tags = 3;
}
```

2. Service Design(5pts)

   Monitor updates - client initiates the call with a post, with ability to add comment IDs later in a stream. The server returns a stream of score updates for the post and the comments.

```
service RedditService {
  ...

  // Extra Credit
  rpc MonitorUpdates(UpdatesRequest) returns (stream UpdatesResponse);
}
```

3. Implementation

   • Implement the server portion of the extra credit API above (5pts)

   Server: https://github.com/tongliu1234/17625-A3-gRPC/blob/main/server.py

```
class RedditServicer(RedditServiceServicer):
  # ... Other API

  def MonitorUpdates(self, request, context):
        post_id = request.post_id
```

```
        comment_ids = request.comment_ids
        while True:
            time.sleep(1)
            post_score = posts[post_id].score if post_id in posts else 0
            comment_updates = [
                {"comment_id": comment_id, "score": comments[comment_id].score}
                for comment_id in comment_ids
                if comment_id in comments
            ]
            yield UpdatesResponse(
                post_score=post_score, comment_updates=comment_updates
            )
```

- Implement the client portion of the extra credit API above (5pts).

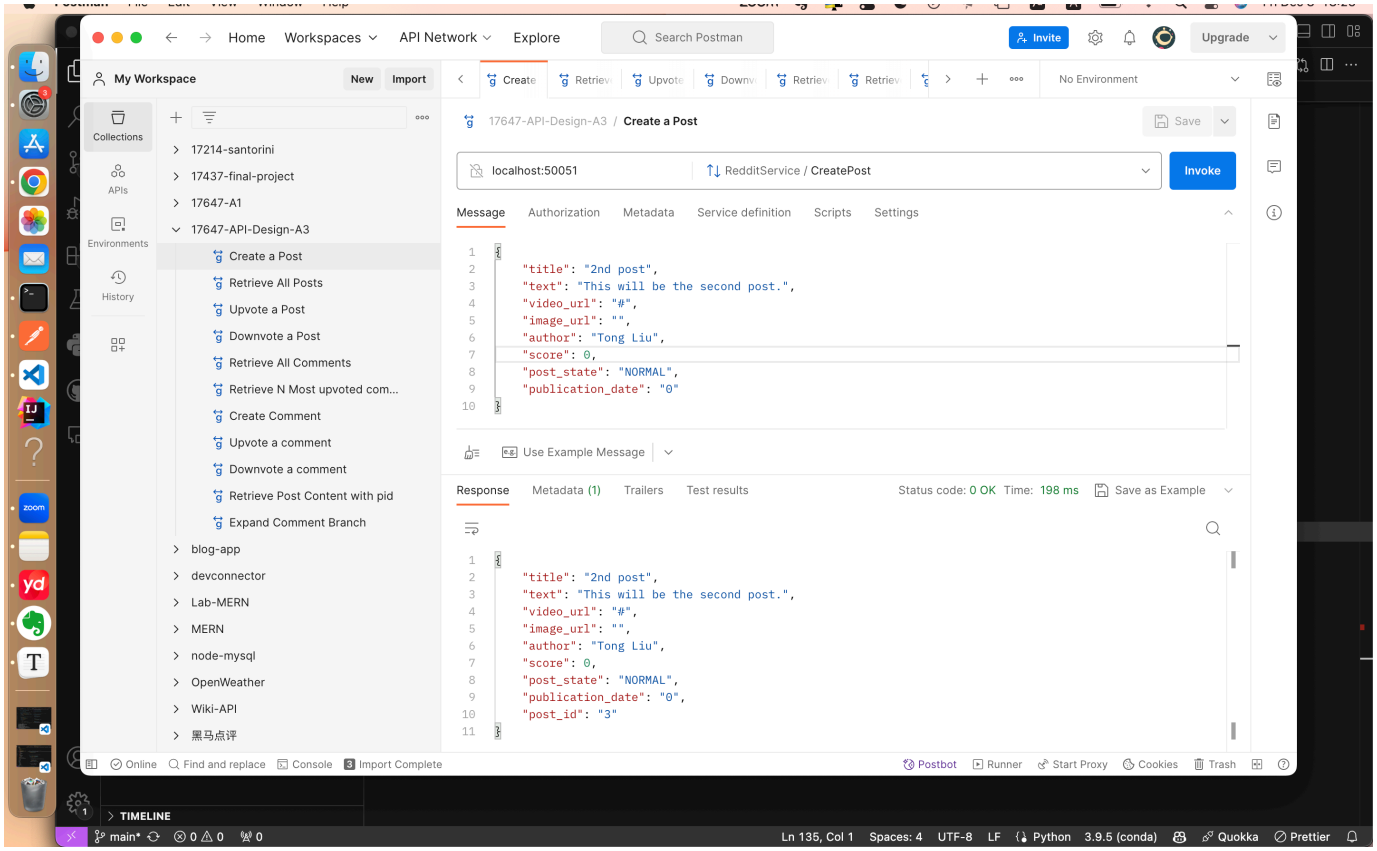
Client: https://github.com/tongliu1234/17625-A3-gRPC/blob/main/client.py

```
class RedditApiClient:
    def __init__(self, server_address):
        self.channel = grpc.insecure_channel(server_address)
        self.stub = RedditServiceStub(self.channel)

    #... Other API

    def monitor_updates(self, updates_request):
        return self.stub.MonitorUpdates(updates_request)

    def close(self):
        self.channel.close()
```

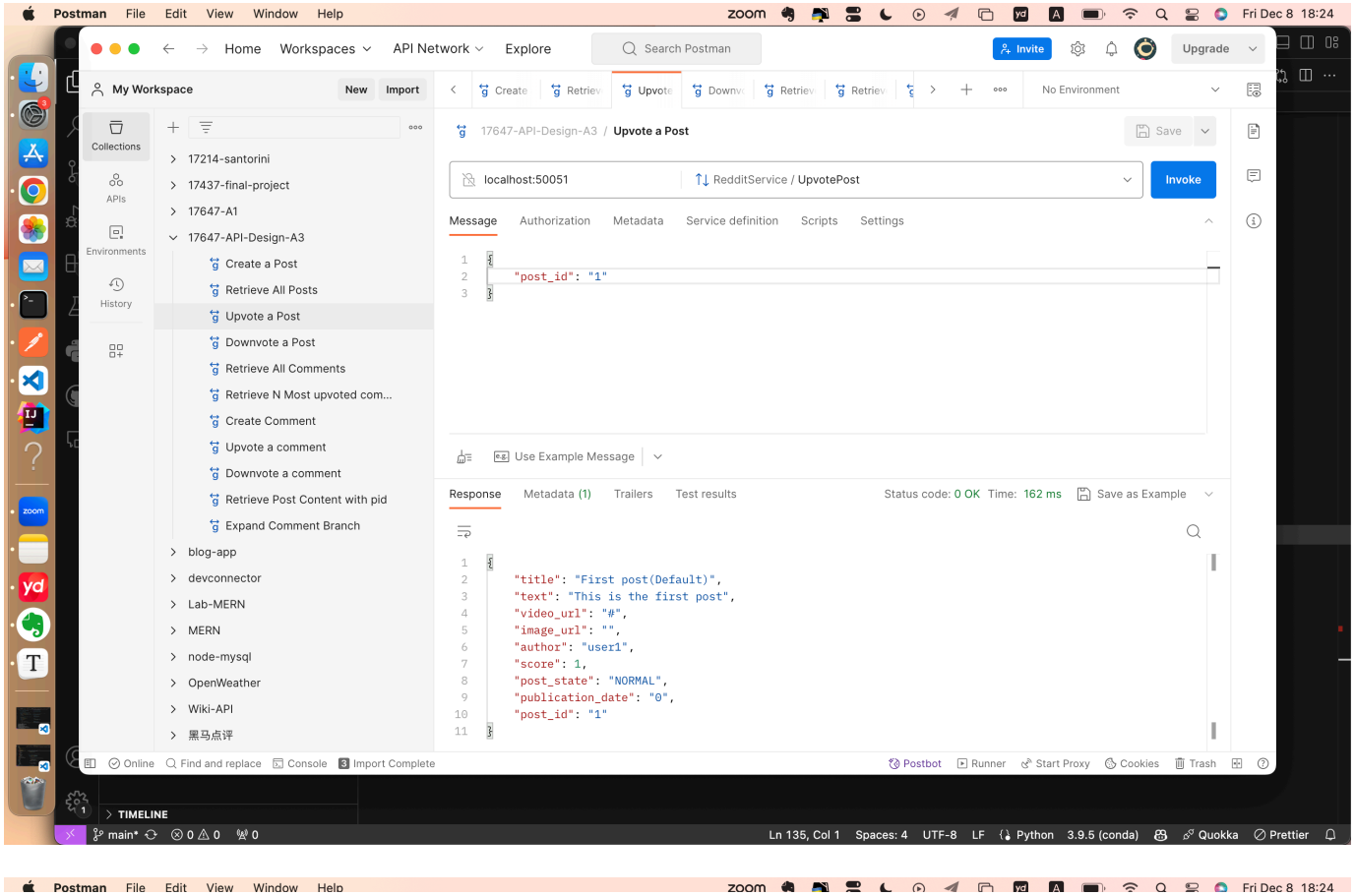
4. Testing(5pts)

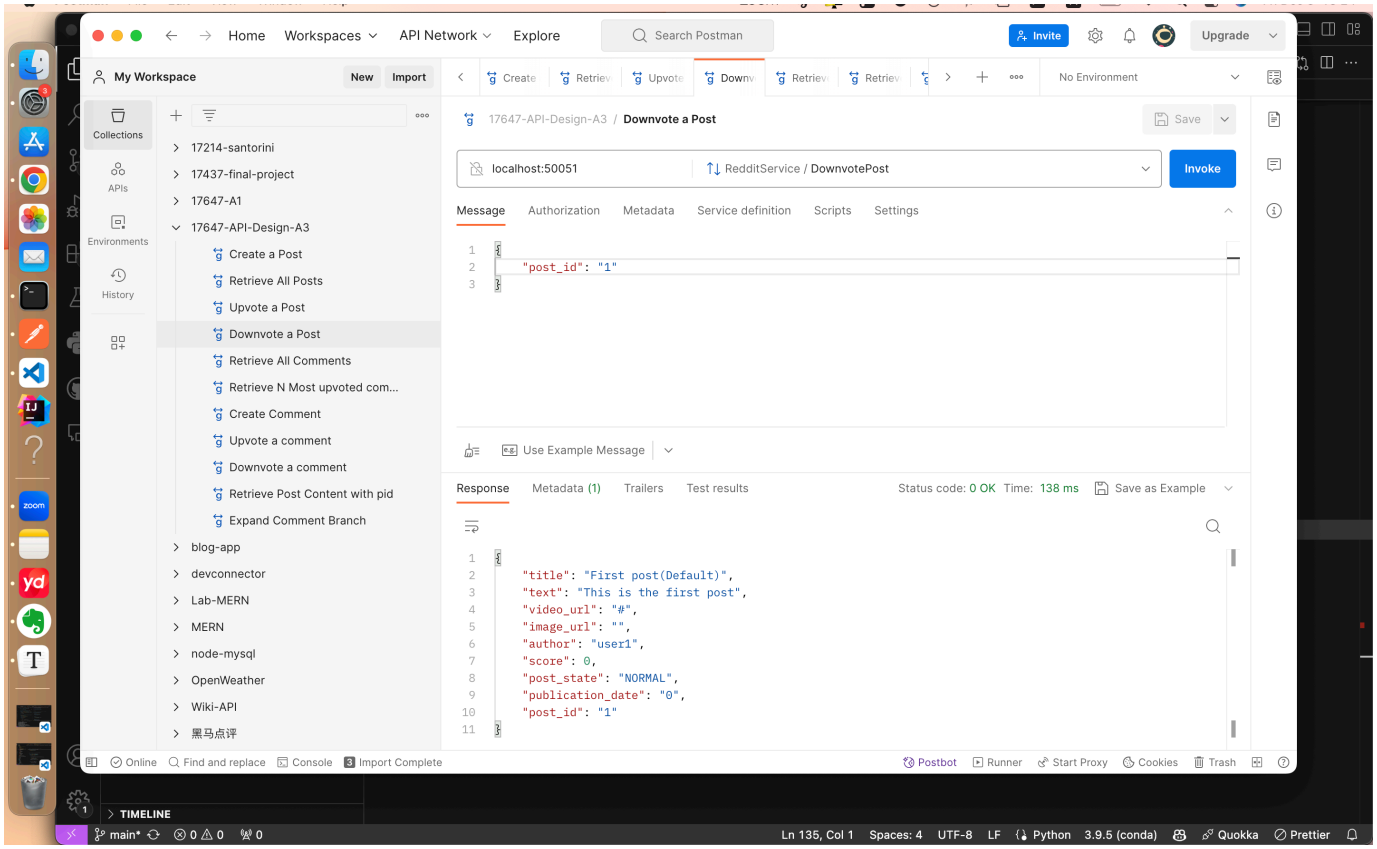
   use Postman to call your API (1pt per API), take a screenshot of the response

- Create a Post.

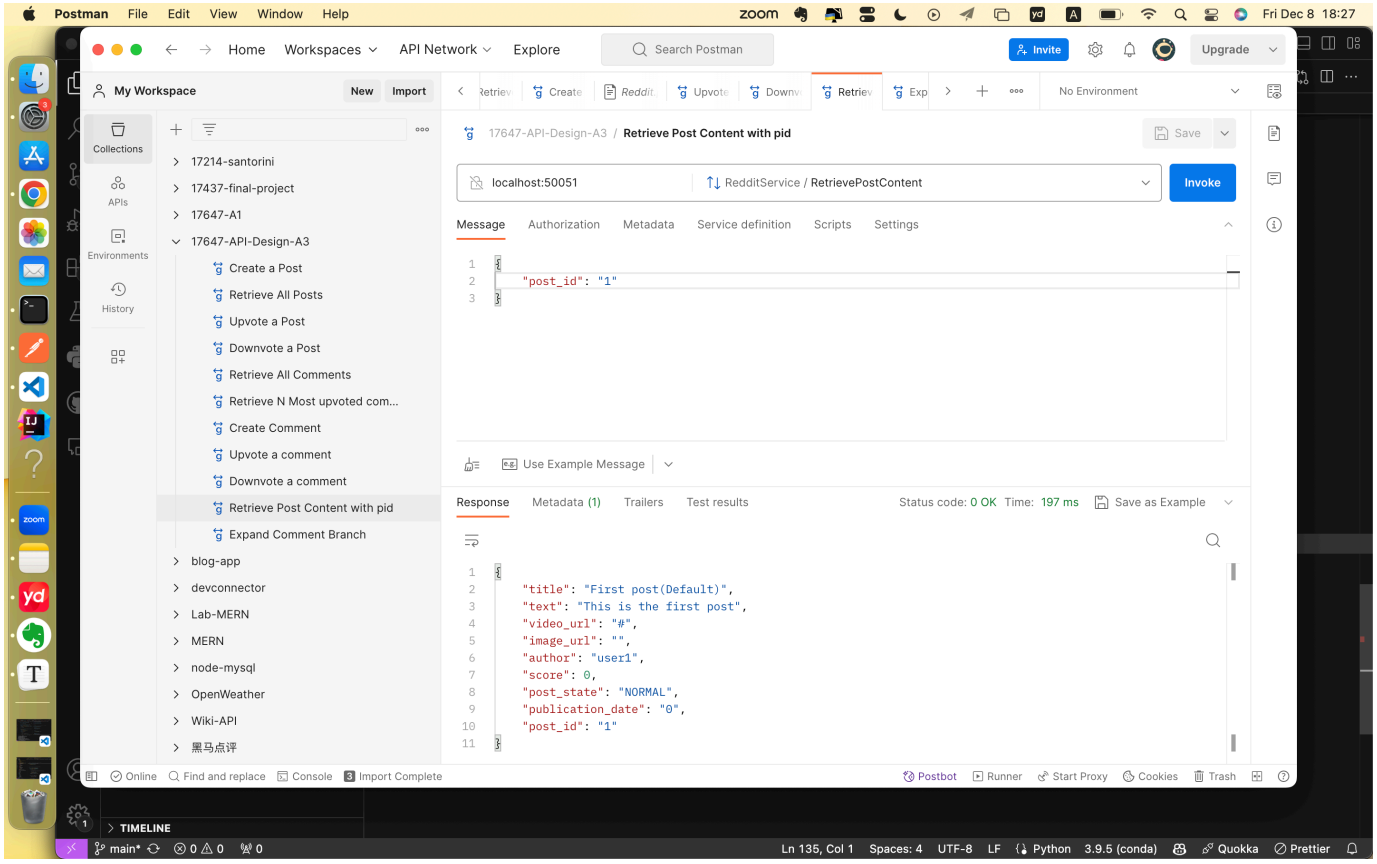


- Upvote or downvote a Post

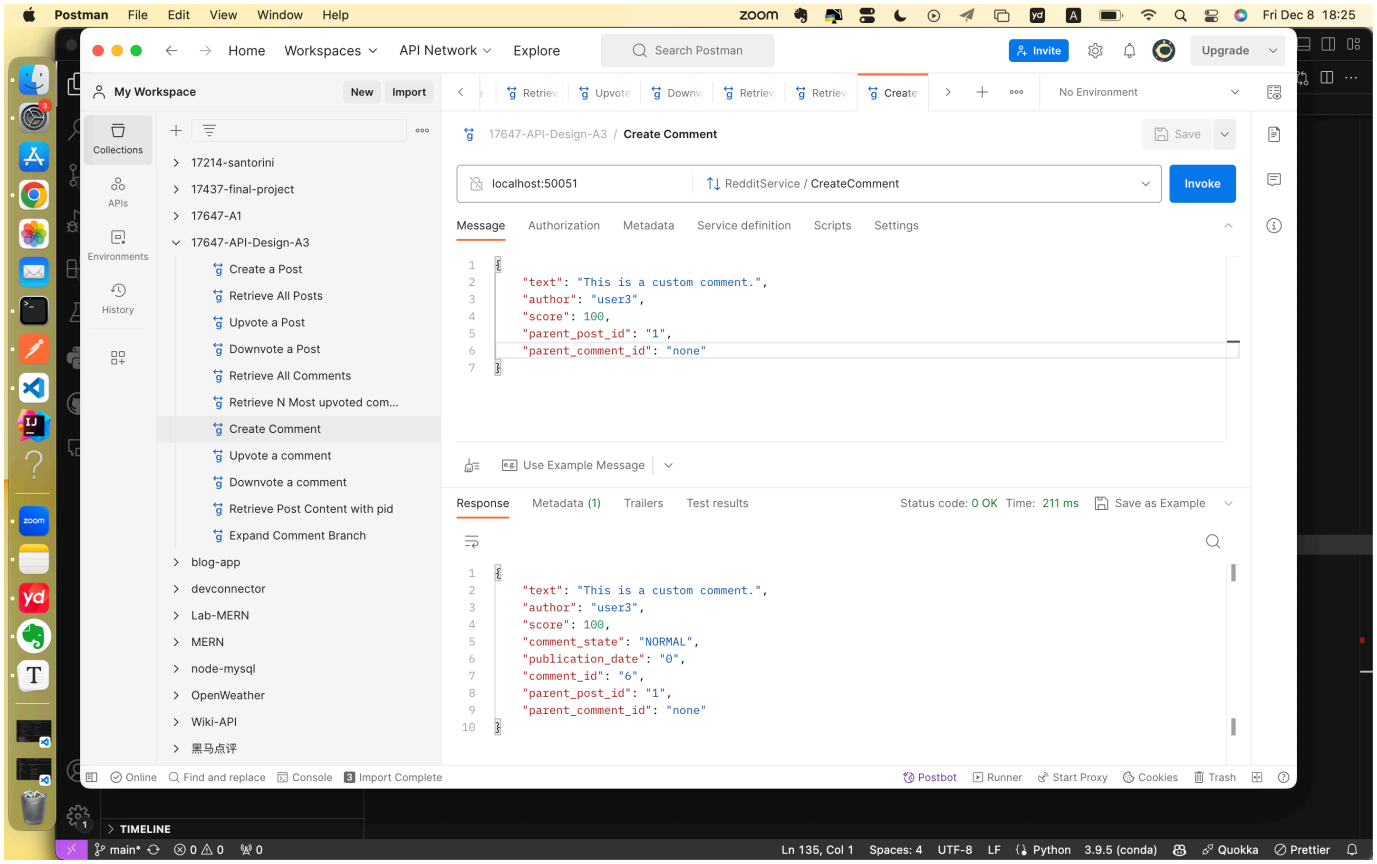




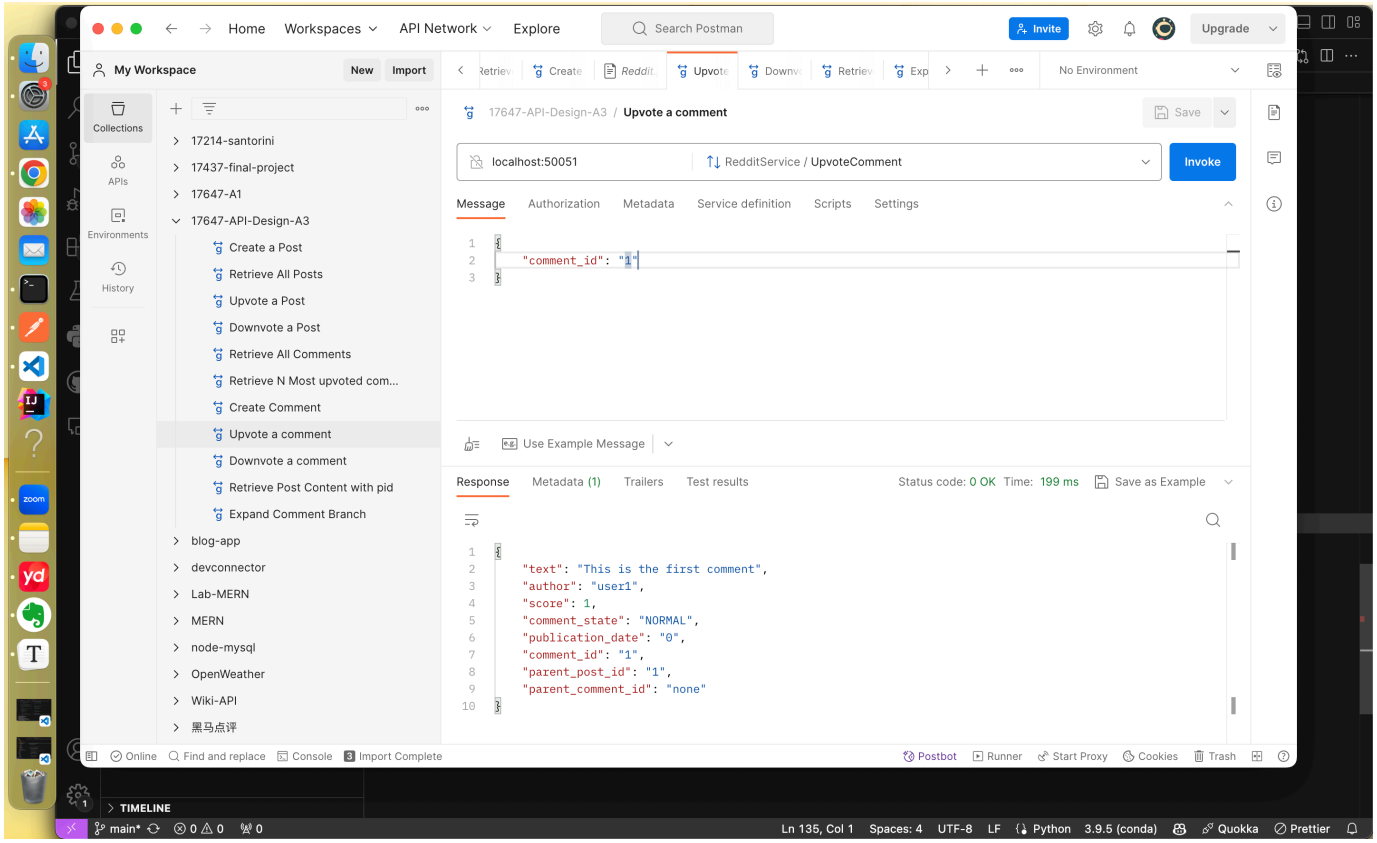
- Retrieve Post content

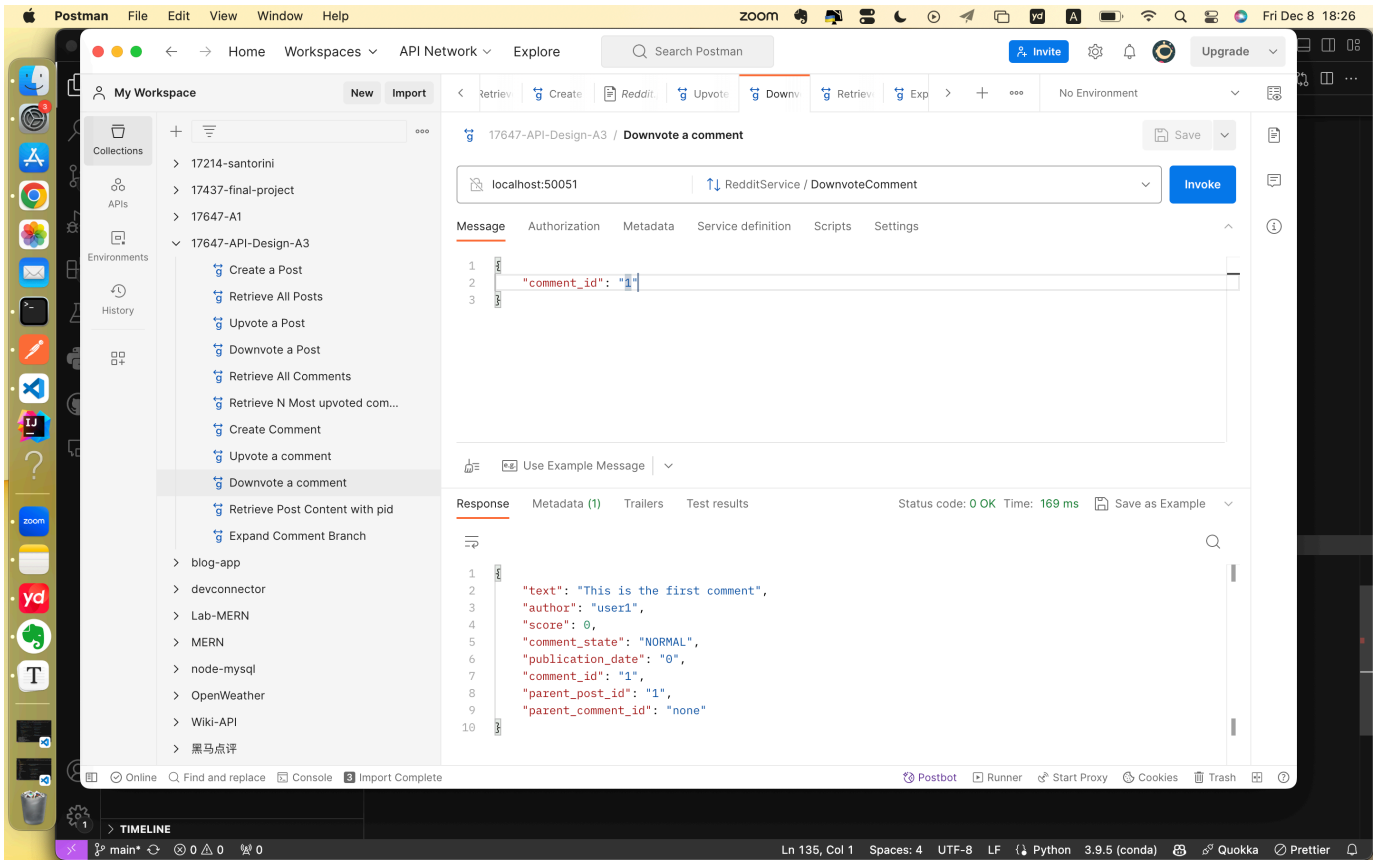


- Create a Comment



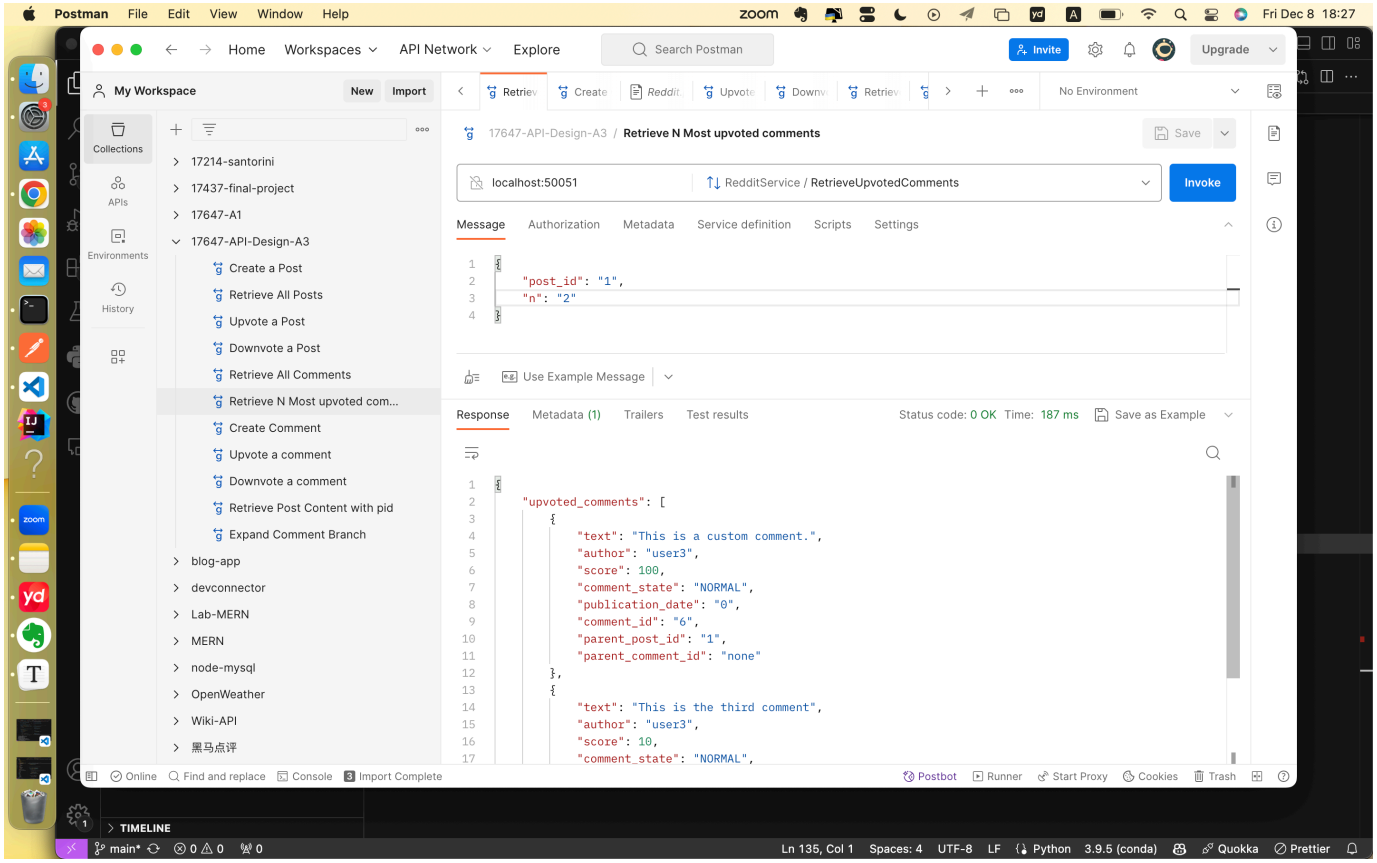
- Upvote or downvote a Comment



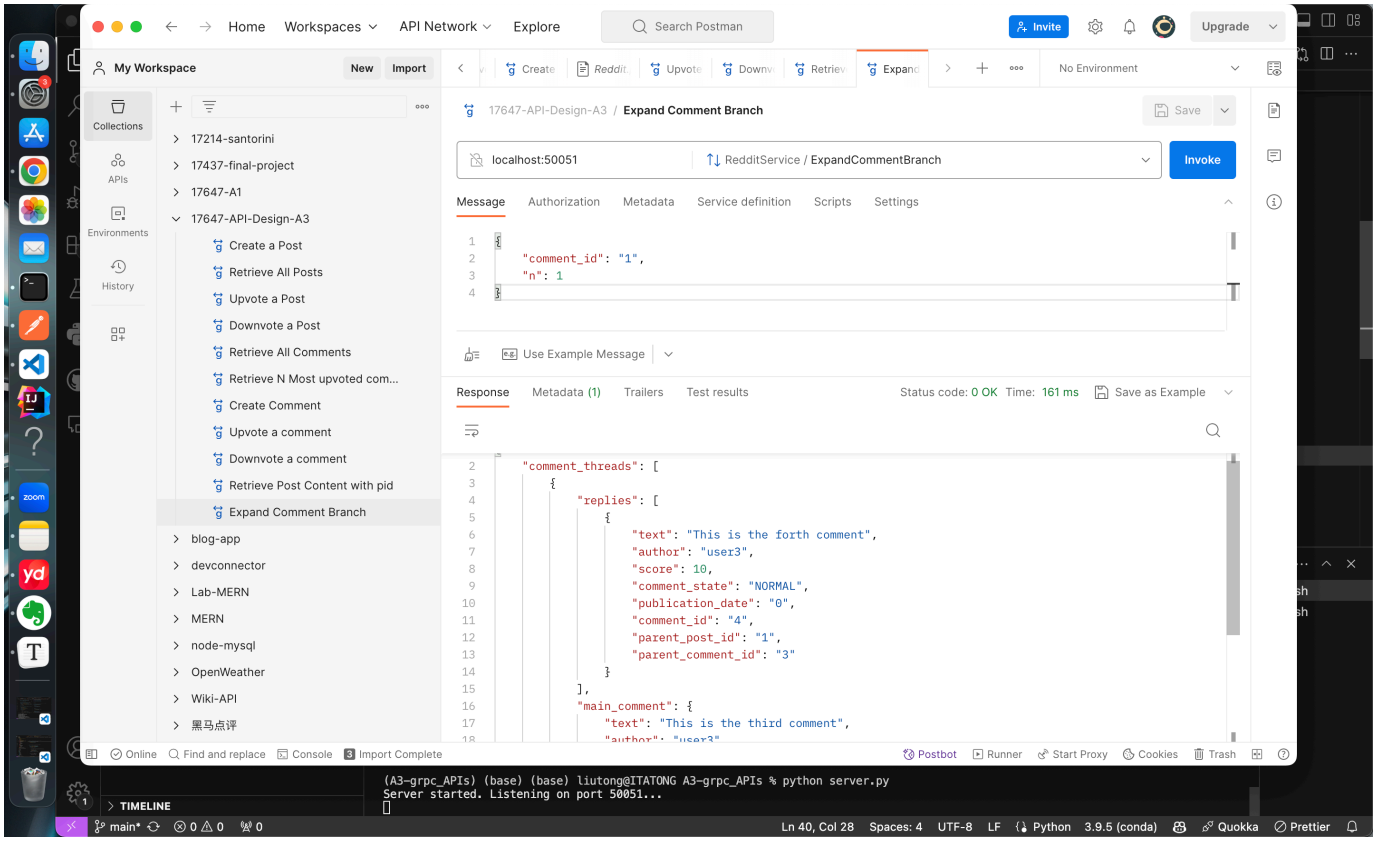


- Retrieving a list of N most upvoted comments under a post, where N is a parameter to the call. The

• Retrieving a list of N most upvoted comments under a post, where N is a parameter to the call. The returned result should indicate whether there are replies under those comments.



• Expand a comment branch. This allows to open most N most upvoted comments under a given comment, alongside with N most upvoted comments under those comments. Essentially, a tree of depth 2.



5.Commands

```
python -m grpc_tools.protoc -I. --python_out=. --grpc_python_out=. Reddit.proto

python server.py

python client.py
```