Lab 2 Information Retrieval

1. The requirements of an image search task

1) Formulation

The searching interface has to contain an input box to upload an image, and users can preview the query image in the searching window.

2) Initiation

The searching interface should have a search button.

3) Review

We should provide an overview of the results.

4) Refinement

The searching interface should allow changing search parameters when reviewing results.

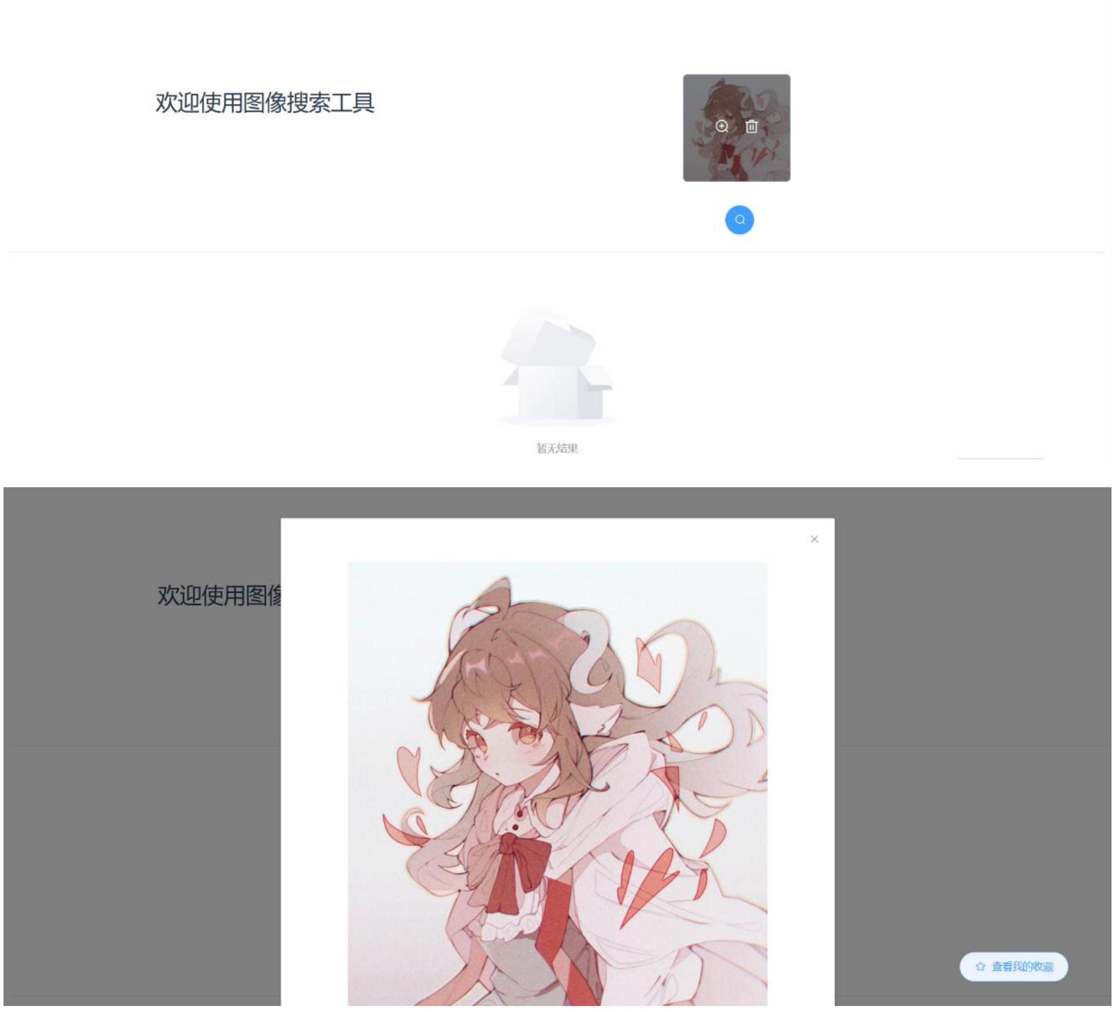
5) Use

Users can take some actions, e.g. add selected images to a favorite list.

2. The demonstration on my project

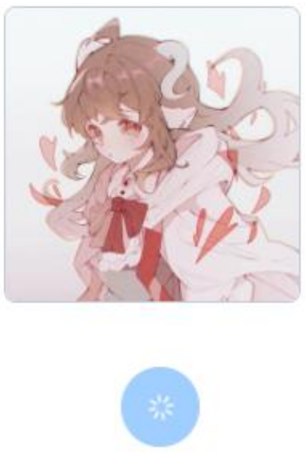
1) Formulation

Users can upload an image and preview it.



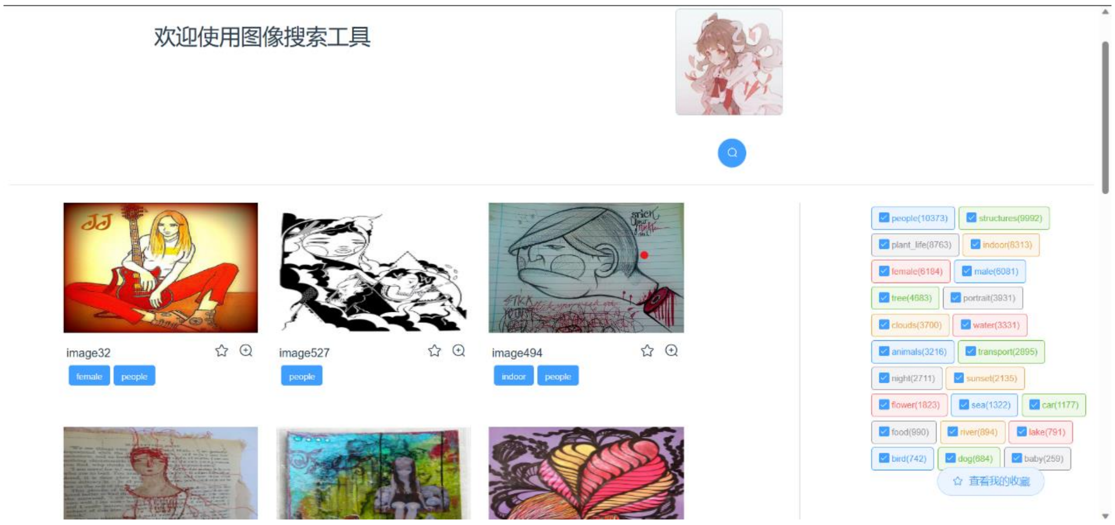
2) Initiation

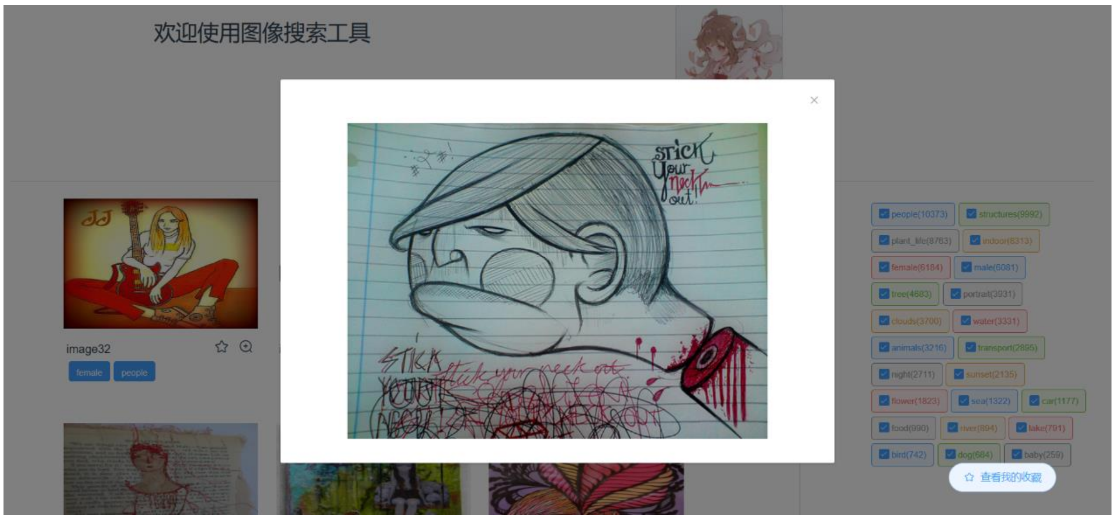
There's a search button below the uploaded image, and it takes a while to get r esult after clicking the search button.



3) Review

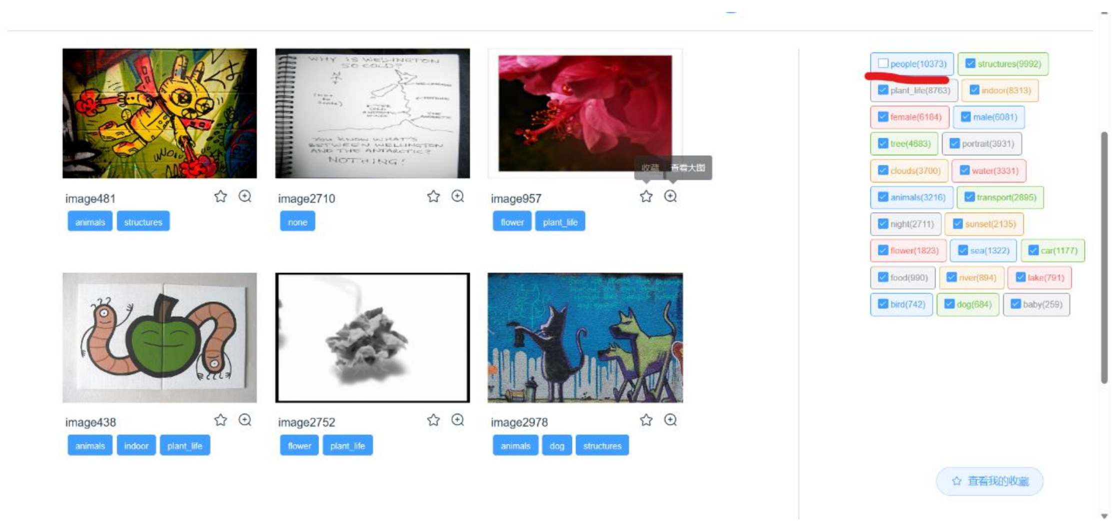
Users can have a rough review on the results.





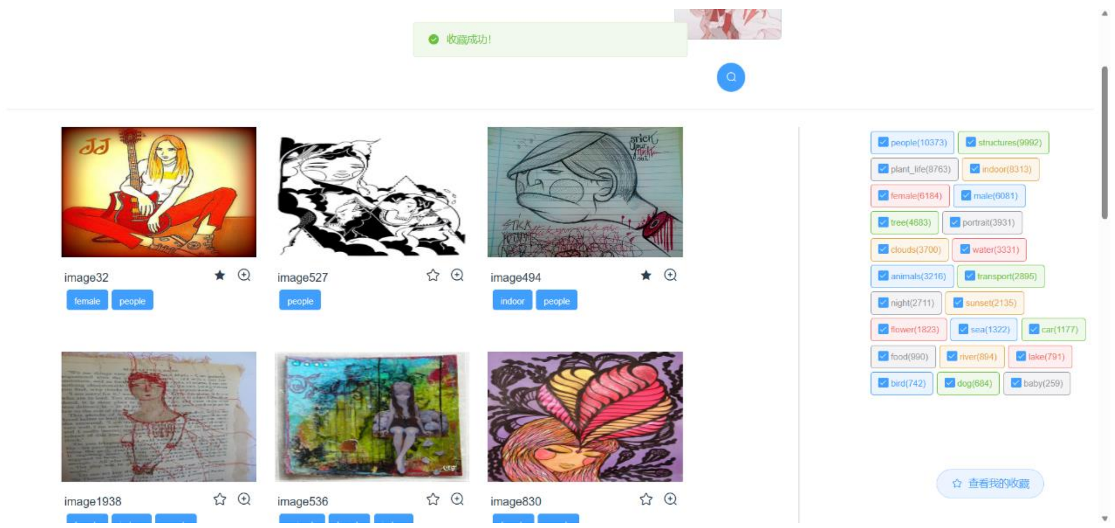
4) Refinement

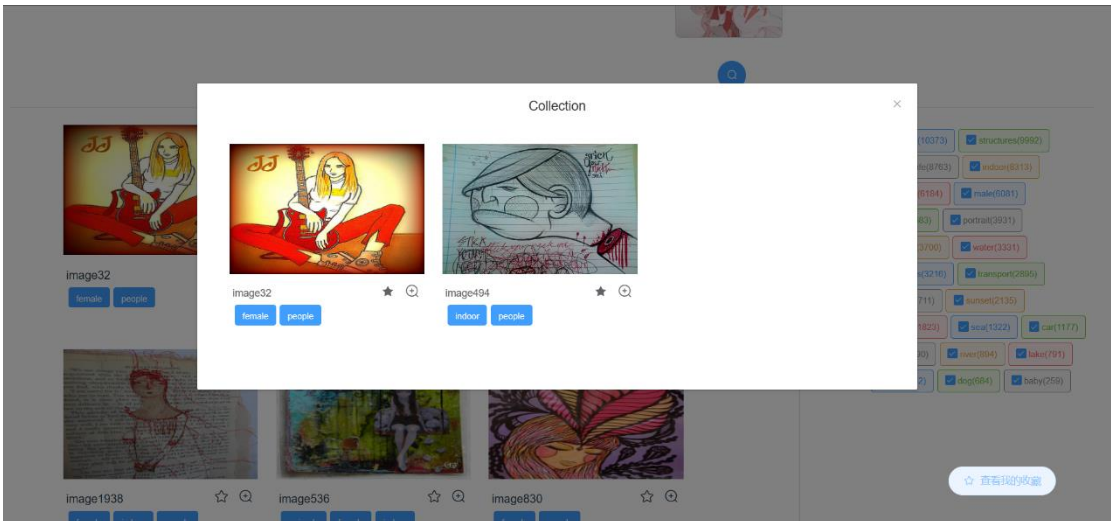
By selecting or deselecting the tags on the right, users can filter the results and get what they want.



5) Use

User can collect the results they like and those images can be viewed in collecti on.

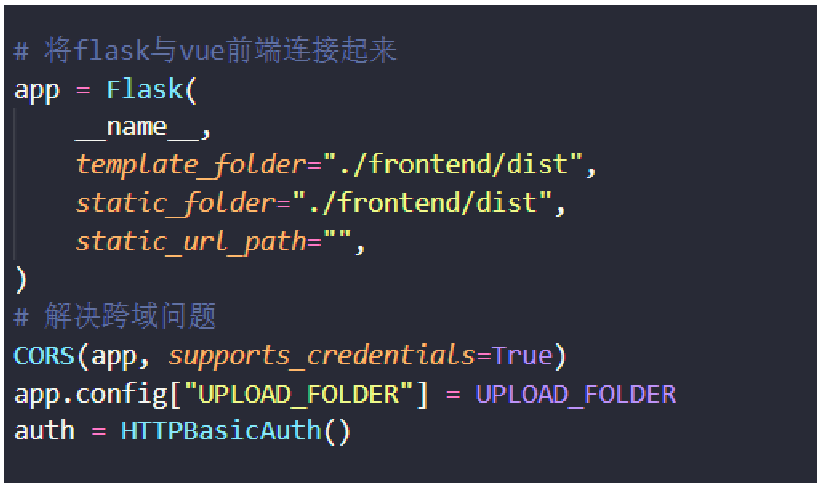




3. Brief description on implementation

In this project, I used Vue as frontend framework, and the Flask framework in Python is used to collaborate with frontend.

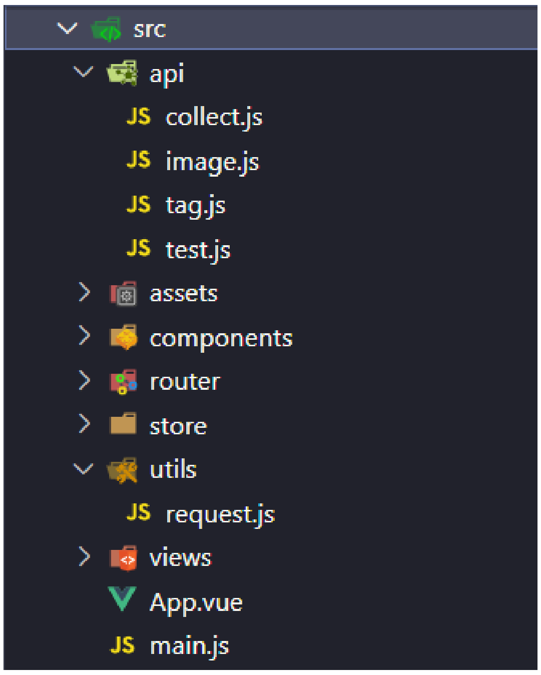
For the backend, Flask has to recognize a folder in which frontend resources are kept, and in this project it is assigned to "./frontend/dist", which contains the results of running the command "npm run build" in frontend.



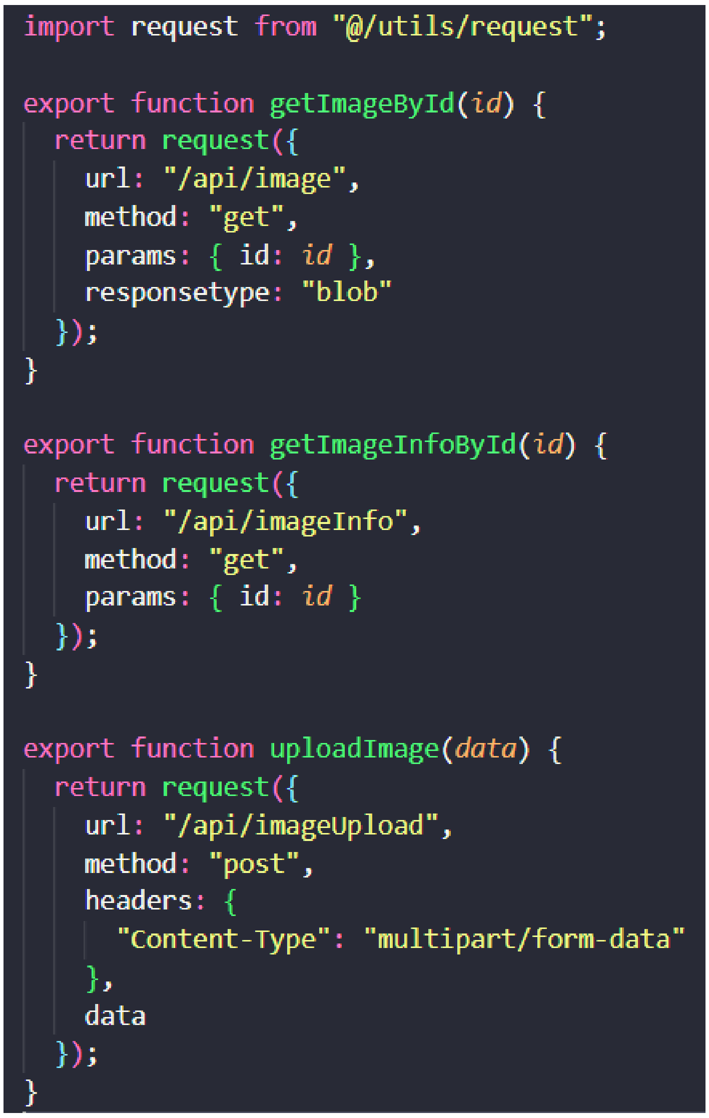
```python
# 将flask与vue前端连接起来
app = Flask(
    __name__,
    template_folder="./frontend/dist",
    static_folder="./frontend/dist",
    static_url_path="",
)
# 解决跨域问题
CORS(app, supports_credentials=True)
app.config["UPLOAD_FOLDER"] = UPLOAD_FOLDER
auth = HTTPBasicAuth()
```

There are two ways of running this project: one is to directly visit http://127.0.0.1:5000/, this is where backend is deployed, and since we have created a connection through folder "./frontend/dist", it is ok to visit backend website directly; another is to start the backend server, then move into frontend folder and run the command "npm run dev", which directs to http://localhost:8080/, this is where frontend is deployed.

In the frontend, I encapsulated axios into a request service, and it provides a unified approach to access apis. The request service is in util folder, and unified apis are in api folder.



```
src
  api
    collect.js
    image.js
    tag.js
    test.js
  assets
  components
  router
  store
  utils
    request.js
  views
  App.vue
  main.js
```



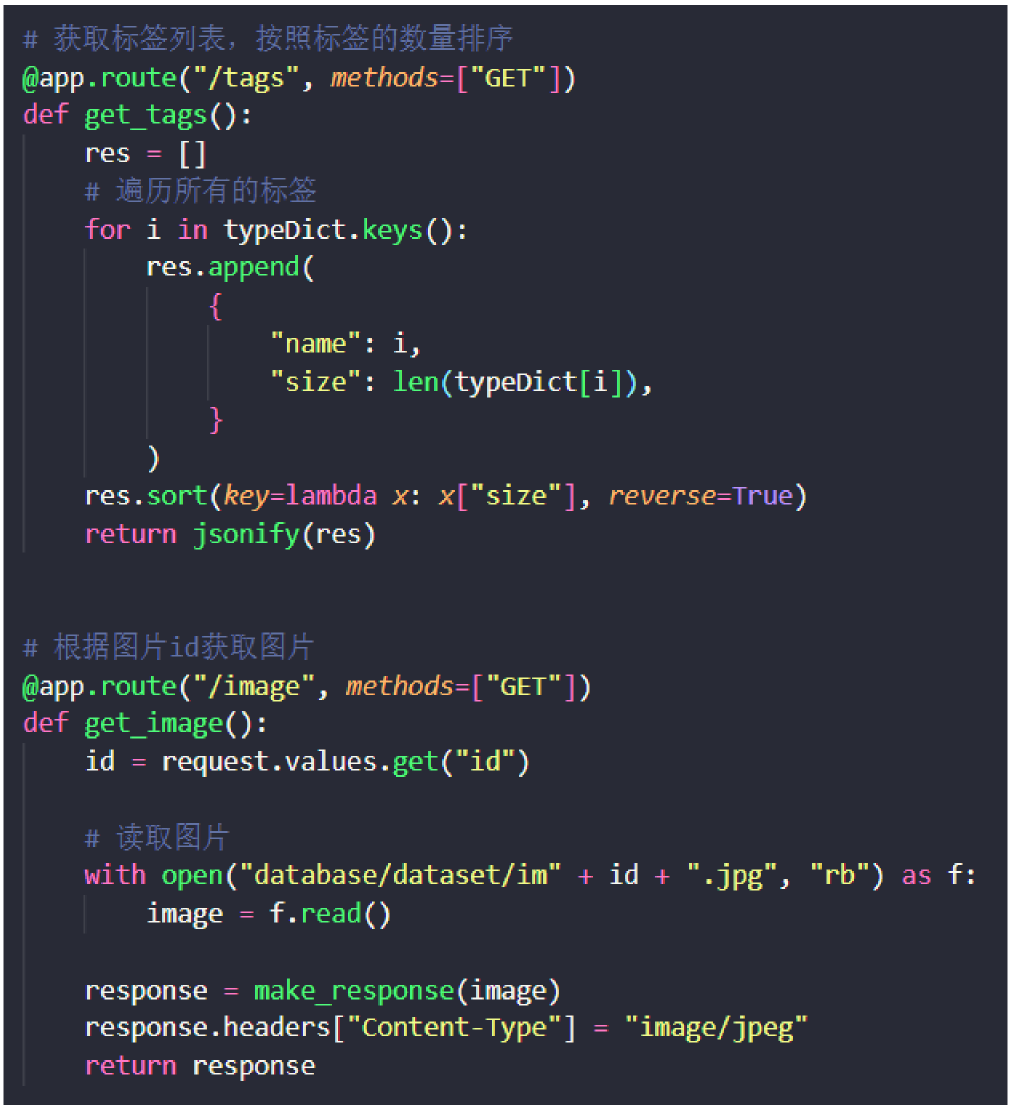
```javascript
import request from "@/utils/request";

export function getImageById(id) {
  return request({
    url: "/api/image",
    method: "get",
    params: { id: id },
    responsetype: "blob"
  });
}

export function getImageInfoById(id) {
  return request({
    url: "/api/imageInfo",
    method: "get",
    params: { id: id }
  });
}

export function uploadImage(data) {
  return request({
    url: "/api/imageUpload",
    method: "post",
    headers: {
      "Content-Type": "multipart/form-data"
    },
    data
  });
}
```

Those apis are connected respectively to backend, where Flask provides a standard to create apis.



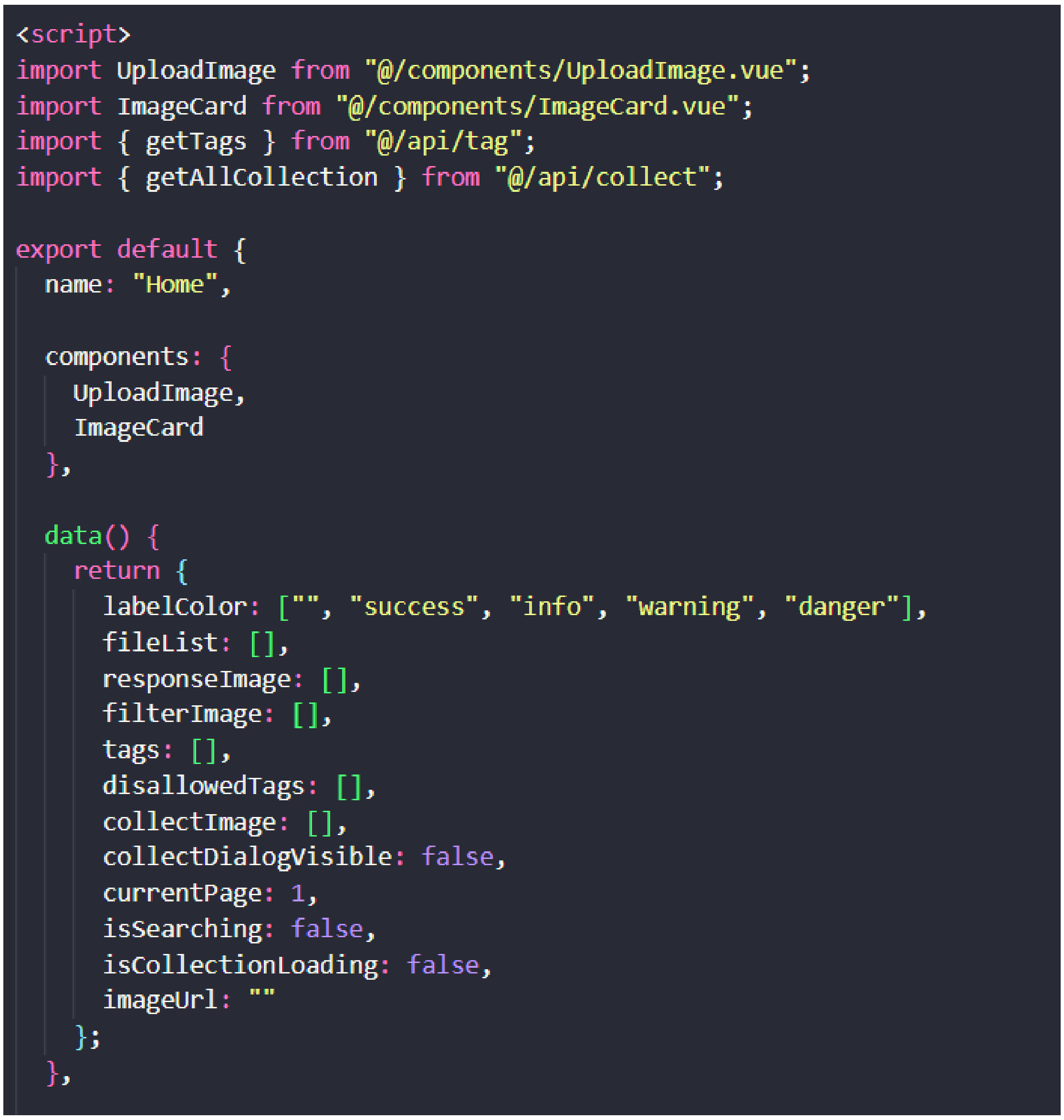
```python
# 获取标签列表，按照标签的数量排序
@app.route("/tags", methods=["GET"])
def get_tags():
    res = []
    # 遍历所有的标签
    for i in typeDict.keys():
        res.append(
            {
                "name": i,
                "size": len(typeDict[i]),
            }
        )
    res.sort(key=lambda x: x["size"], reverse=True)
    return jsonify(res)


# 根据图片id获取图片
@app.route("/image", methods=["GET"])
def get_image():
    id = request.values.get("id")

    # 读取图片
    with open("database/dataset/im" + id + ".jpg", "rb") as f:
        image = f.read()

    response = make_response(image)
    response.headers["Content-Type"] = "image/jpeg"
    return response
```

Back to frontend, the main page displayed to users is Home.vue, and it contains two components which are created by me: ImageCard and UploadImage. ImageCard defines how each image is displayed, it includes an image, the name of the image, collect button and zoom-in button. UploadImage provides input box for users as well as the function of previewing the searching image.



```
<script>
import UploadImage from "@/components/UploadImage.vue";
import ImageCard from "@/components/ImageCard.vue";
import { getTags } from "@/api/tag";
import { getAllCollection } from "@/api/collect";

export default {
  name: "Home",

  components: {
    UploadImage,
    ImageCard
  },

  data() {
    return {
      labelColor: ["", "success", "info", "warning", "danger"],
      fileList: [],
      responseImage: [],
      filterImage: [],
      tags: [],
      disallowedTags: [],
      collectImage: [],
      collectDialogVisible: false,
      currentPage: 1,
      isSearching: false,
      isCollectionLoading: false,
      imageUrl: ""
    };
  },
```