Imental

Project Report

Group Members:
Wu Junxian
Wang Kedi
Ying Zhuozuo
Zong Jiulin

28/10/2021

Business Part: **6**
Ⅰ Background 6
1.1 Situation 6
1.2 Solution 7
Ⅱ Product Description 8
2.1 Product Overview 8
2.1.1 Product Positioning 9
2.1.2 Technology and Function 9
2.2 Product Usage 10
2.3 Product Innovation 11
2.3.1 Technical Innovation 11
2.3.2 Functional innovation 11
2.3.3 Market innovation 11
2.4 Product Effects 12
2.5 Future Development 12
Ⅲ Market Analysis 13
3.1 Target Market 13
3.2 Market Research 13
3.3 Market Value 13
3.4 Competitive Analysis 14
Ⅳ Commercial Mode 14
4.1 Operation Mode 15
4.2 Product Promotion 15
4.3 Product Advantages 15
4.4 Development Prospect 15
4.5 Potential Partners 16
Ⅴ Risk Analysis 16
5.1 Market Risk 16
5.2 Product Risk 16
5.3 Financial Risk 17
5.4 Technical Risk 17
Ⅵ Team Management 17
6.1 Team Composition 17
6.2 Team Development 18
Ⅶ Product Promotion 18
7.1 Early Stage 18
7.1.1 Online 18
7.1.1.1 App Store Promotion 18
7.1.1.2 Inner Application Promotion 19
7.1.1.3 New Media Promotion 19
7.1.2 Offline 20
7.2 Middle Stage 20
7.2.1 Online 20

7.2.1.1 Socialized Marketing 20
7.2.1.2 Data Analysis 20
7.2.2.3 Content and Advertorial 20
7.2.2 Offline 20
7.3 Late Stage 21
7.3.1 Online 21
7.3.1.1 Event Marketing 21
7.3.1.2 Celebrity Forwarding 21
7.3.2 Offline 21

Technique Part: 21
Ⅰ Database: 21
1.1 Database Environment 21
1.2 Entity Design 22
1.3 Relation Design 23
Ⅱ Front-end Development: 24
2.1 Flask 24
2.2 HTML & CSS 24
2.3 Javascript 25
Ⅲ Model Design and Platform Used: 25
3.1 Platform 25
3.1.1 Docker 25
3.1.2 What 26
3.2 Model 27
3.2.1 Text Emotion Recognition 28
3.2.2 Text Emotion Classification 28
3.2.2.1 ERNIE 29
3.2.2.2 SKEP 29
3.2.3 TF-IDF 30
3.2.4 Text Similarity Matching 31
Ⅳ Challenges and Innovations: 31
4.1 Database 31
4.2 Front-end 32
4.3 Model and Chatbot 32
4.3.1 How does text classification detect emotion? 32
4.3.2 How to make a portable chatbot? 32
4.3.3 How to realize Several rounds of talks? 33
4.3.3.1 One-round simple Q&A base on text_generation with GPT model 33
4.3.3.2 Multi-rounds chatbot based on Unified Transformer 33
4.3.4 How to realize medical Q&A? 34
4.3.5 How to realize multi-language? 34
4.4 Other Issues 35
4.4.1 How to create a commercial website? 35
4.4.2 How about some specific area? 35

Appendix: **35**
Ⅰ Project Proposal 35
Ⅱ System Functionalities Mapping 39
Ⅲ Database Design Document 40
1 Introduction: 40
1.1 Writing Purpose: 40
1.2 Scope: 40
1.3 Definition: 40
2 Database Environment: 40
3 Logical Structure Design: 41
3.1 Entities: 41
3.2 Relations: 42
4 Physical Structure Design: 42
4.1 Tables: 43
5 Safety Design: 48
5.1 Configuration of Database Roles and Permissions 48
Ⅳ Installation and User Guide 48
1 Installation 48
1.1 Imental - Chatbot 48
1.1.1 Cloud Server Establish 48
1.1.2 Wechaty Establish 49
1.1.3 Download our Model and Code 49
1.2 Imental - WordPress 50
1.2.1 Establish 50
1.2.2 Build the Project 51
1.2.3 Enjoy with WordPress 51
1.3 Imental -- Webpage 51
1.3.1 Load Database 51
1.3.2 Environment Configuration 51
1.3.3 Start Exploring 51
2 User Guide 52
2.1 Imental -- Chatbot 52
2.2 Imental -- Wordpress 54
2.3 Imental -- Webpage 60
Ⅴ Implementation in Tools 65
1 Imental -- Chatbot 65
1.1 paddlepaddle 65
1.2 paddlenlp 65
1.3 paddlehub 66
1.4 wechaty 66
2 Imental -- Questionnaire 66
2.1 Flask 66
2.2 Echarts 66
Ⅵ Individual Reports 66

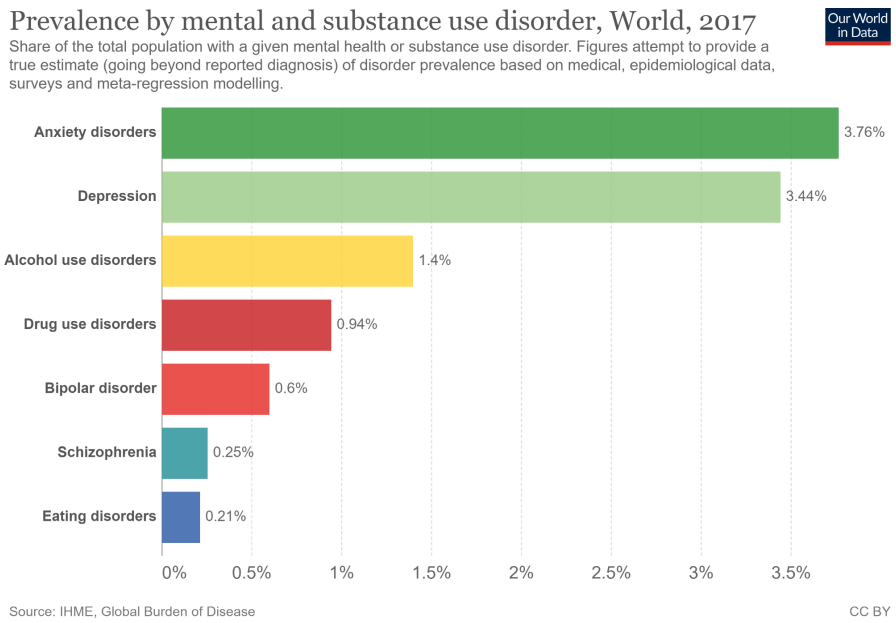
Wu Junxian -- A0231293L 66
Personal Contribution: 66
Learning Outcome: 66
Knowledge and Skill Application: 67
Wang Kedi -- A0231356L 67
Personal Contribution: 67
Learning Outcome: 67
Knowledge and Skill Application: 67
Ying Zhuozuo -- A0231534N 67
Personal Contribution: 67
Learning Outcome:, 67
Knowledge and Skill Application: 68
Zong Jiulin -- A0231352U 68
Personal Contribution: 68
Learning Outcome: 68
Knowledge and Skill Application: 68

Business Part:

Ⅰ Background

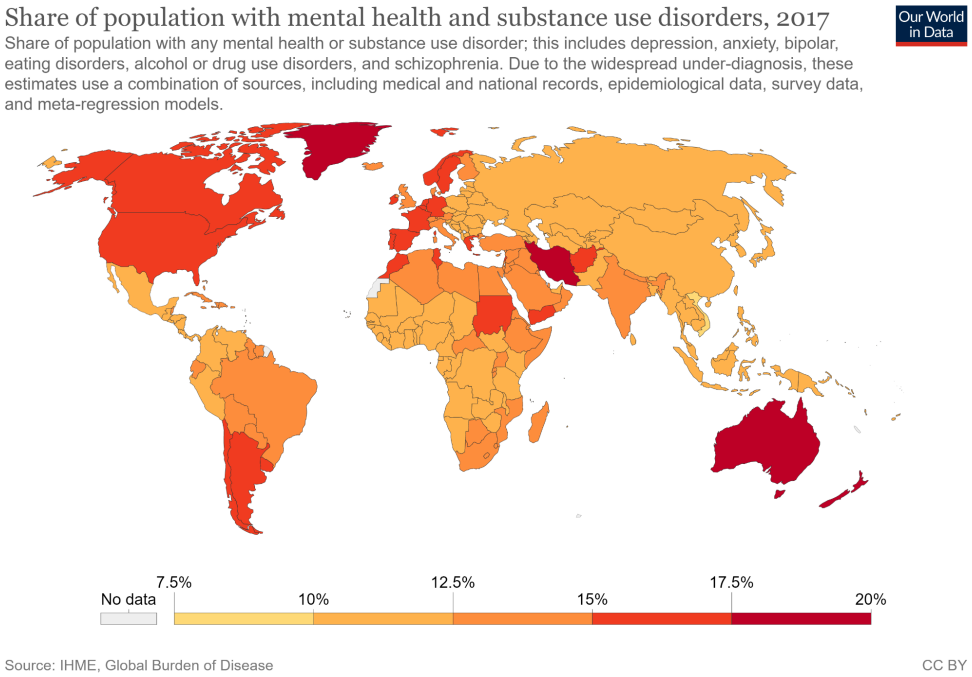
1.1 Situation

Some people don't have a good way to vent under the pressure of life, study, and work; Some people always feel unhappy in the process of interpersonal communication; Some people are bitter about trifles. These pressures and emotions are common in most people, but in most cases, they will not have a great impact on life. However, they will gradually accumulate until some people will erupt and make some extreme behaviors, or some people are unconsciously affected by this negative state.



Worldwide prevalence and substance use disorder in 2017

Most people are used to the negative factors in life, never consider the long-term results, and just bear them silently. Even if a small number of people are concerned about this, they will not seek medical treatment because of this small situation, whether for economic or social considerations. There will also be various concerns in the process of sharing and communicating with family and friends. The appropriateness of discourse, the empathy of events, and the sensitivity of relationships will affect the benefits of communication.

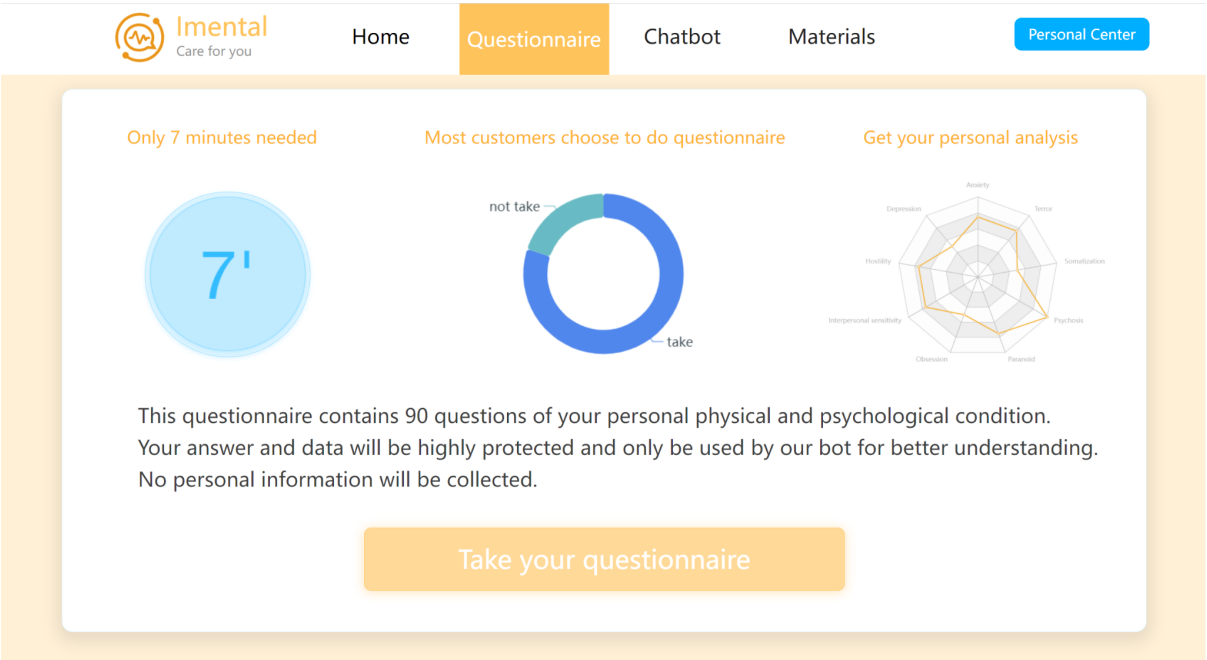


Worldwide population with mental health and substance use disorder in 2017

1.2 Solution

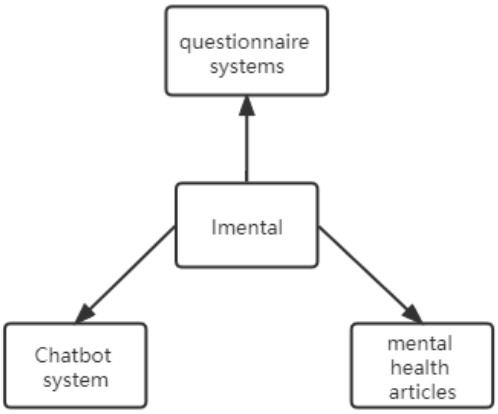
Whether users are troubled, seek solutions online, or occasionally find their situation consistent with this through promotion, we will provide them with enough help. There is no economic cost, nor the tension and obscurity in the face of human psychologists. As long as you gently open your mouth, you can get the corresponding comfort. We will help users think about their situation through a series of induced dialogues, and gradually help them untie their knots.

Our system has gathered several classic questionnaires on mental issues and users can fill in them at any time. Then you can communicate with our chatbot and our system will make a preliminary diagnosis according to the chatting and your answers to the questions. Our system will also recommend related articles on this symptom.



Imental questionnaire interface

The privacy of users will be completely kept confidential. Only users and chatbots will know the relevant contents of the communication. Secular prejudice and inner obscurity are no longer obstacles to communication.



Simple function structure of Imental

Ⅱ Product Description

2.1 Product Overview

Imental is a system focusing on mental issues diagnosis. We'd like to help you release the pressure, face the mental health problems and overcome them together.

2.1.1 Product Positioning

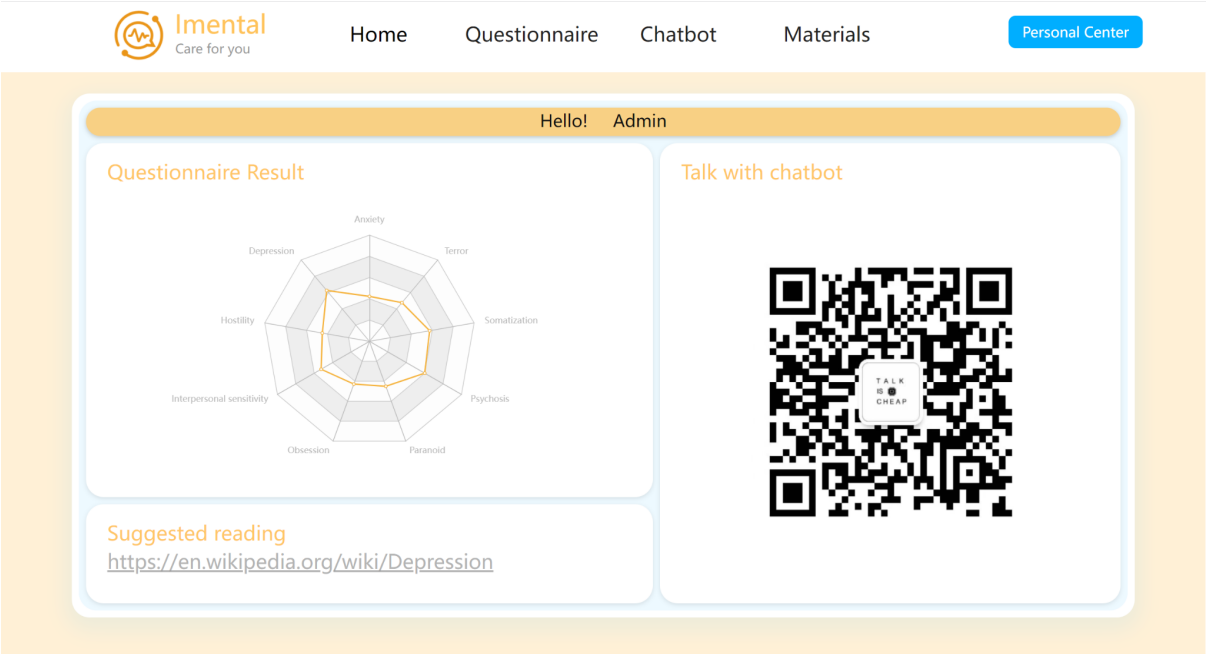
Our product is aimed to solve the phenomenon of people suffering psychological problems but not willing to see a psychologist. Most of them are young students or employees who are under pressure and are always troubled by anxiety. However, They are reluctant to seek medical treatment because they are afraid that their psychological problems will become the gossip of others, or they simply can not afford the high cost of the consultation. In this situation, our online system can help.

Our chatbot is trained with mental diagnosis samples and can lead users to share their feelings. We also have professional psychological scales, which are similar to those in psychological clients. According to the user's performance, we can make a preliminary diagnosis, give corresponding suggestions and recommend corresponding articles. At the same time, we can ensure the privacy and security of users. Except for a user's data table that can be viewed only with the highest permission, the rest are replaced by user ID. Even the administrator can only know the corresponding user ID instead of the real name.

2.1.2 Technology and Function

We used machine learning to build the diagnostic and recommending system, and reasoning to build the chatbot. The front end is programmed in JavaScript HTML and CSS, and the back-end is implemented with a flask. The database and call statements are edited by MySQL. The model is implemented in Python.

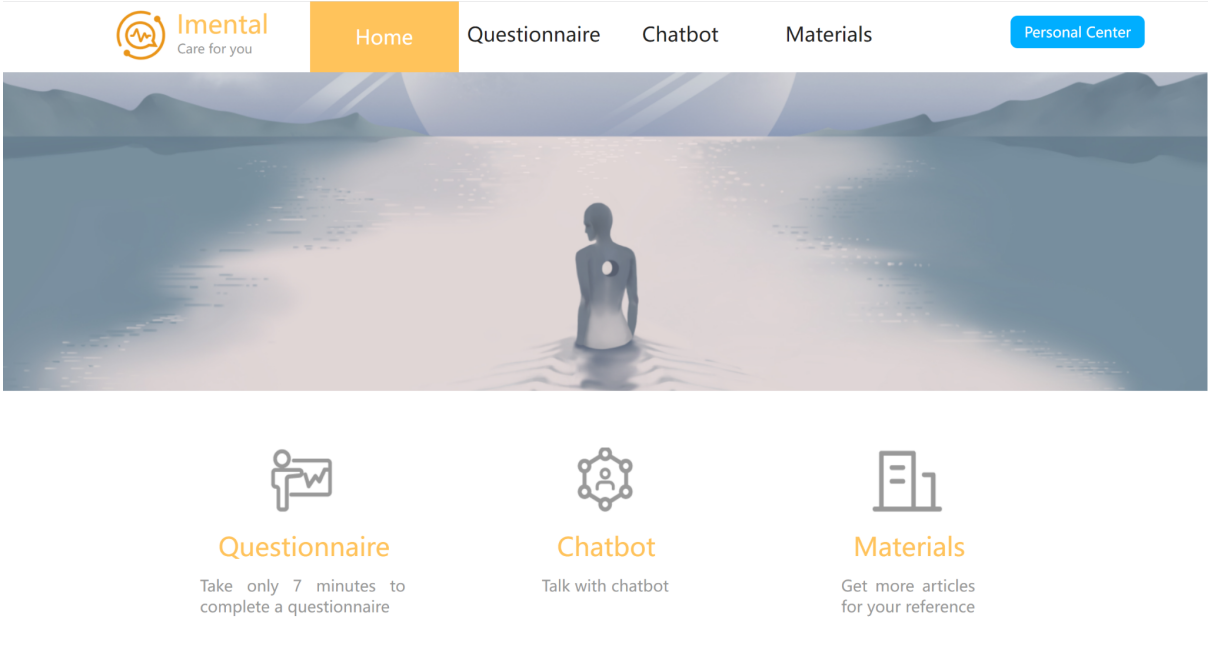
We would like to implement three parts of the system, the first one is questionnaire taking, the questions you took and your answers will be recorded to the dataset and our bot will make a final judgment based on that. The second part is the articles we gathered from the internet about mental health, you can read them at any time. The third part is the chatbot. Through a series of induced dialogues, help users think about their situation and gradually help them untie their knots. In this process, it will also recommend questionnaires for better analysis and in the end, recommend articles to guide you.



Personal center page

2.2 Product Usage

Our chatbot will be made into a website. You can sign up with your email address or phone number and then log into the main page. There will be three parts on it: classic psychology questionnaires, chatbot, and psychology articles. You can go into the questionnaire part to select a questionnaire, or go through the paper list, where the articles are classified according to different symptoms. Or, you can directly go to the chatbot and it will lead you to talk about your feelings. it can also recommend questionnaires and articles so you can even skip the first two parts. We will also pay attention to your browsing history on articles to follow your convalescence.



Home page of Imental

2.3 Product Innovation

2.3.1 Technical Innovation

Here we trained deep learning models to form our chatbot and reasoning for Article recommending(Searching method). Although both of them are not the newly created technology, there are rarely applications of psychological consultation.

2.3.2 Functional innovation

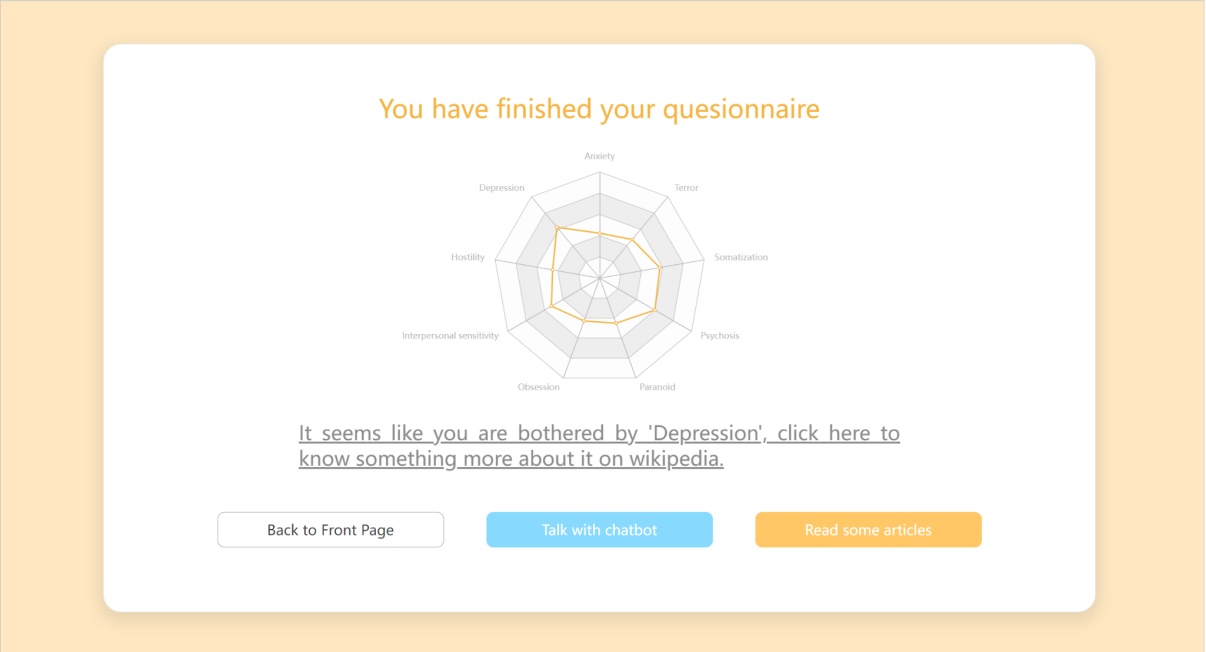
In the future, our product will combine the chatbot with the recommendation system. Through the dialogue with the user, the bot can more accurately recommend the questionnaire suitable for the user's symptoms, and then make the initial diagnosis and recommend the appropriate articles through the answers filled in by the user. This not only saves users a lot of time to do questionnaires and find articles but also helps the system make a more accurate diagnoses.

2.3.3 Market innovation

Today's young people are under increasing pressure from work and life, so their mental health needs more and more attention. However, neither society nor themselves seem to have enough understanding of mental health. For those who are unwilling to consult a psychologist for various reasons, our online chatbot can provide a convenient and free option. At the same time, we sorted out the commonly used psychological test questionnaires to improve the diagnostic accuracy and collected articles on mental health to facilitate users to further understand the situation.

2.4 Product Effects

Our product is expected to achieve a preliminary diagnosis, which should at least judge whether the user is mentally healthy or has mild, moderate, or severe psychological problems. The average health score should be generated according to the score of different types of problems, and give a general problem direction, such as anxiety, depression, or paranoia.



Problem classification and scoring sample

In addition, in the future, our chatbot will recommend appropriate articles and methods to users according to the judgment results.

2.5 Future Development

In future product development, we first need to expand the number, scope, and direction of the questionnaire. To better fit the situation that the user may encounter, ask the user's symptoms more specifically, and diagnose more accurately.

At the same time, we also need to further optimize the chatbot. We not only need to ask users for symptoms, make diagnoses and give recommendations, but also guide users to share their feelings and face possible extreme emotions, such as hysteria. In this case, the bot needs to judge that the user's emotion is out of control in a short time, appease the user to avoid deterioration, and gradually calm the user's emotion to guide them back to the normal dialogue.

For the article recommendation (Search) system, we hope to cooperate with relevant professional psychology medical institutions or psychological counseling organizations in the future to obtain their professional articles (currently our number of articles is relatively small), to obtain more extensive, accurate and well-matched articles. At the same time. It can also

ensure that the article recommendations we give will not be out of date and keep the latest timeliness.

Ⅲ Market Analysis

3.1 Target Market

Imental is an online psychological information platform based on questionnaires and online chat to give users preliminary diagnoses and suggestions. Different from traditional psychological counseling, we do not need a psychologist to diagnose online, but a chatbot to complete all this.

Our target users are those who are under pressure and have potential psychological problems or risks. Some of them don't want to consult a psychologist because they are afraid of rumors, don't have enough time, have a more accurate diagnosis, or don't have enough money. At this time, our online chatbot will be a good choice.

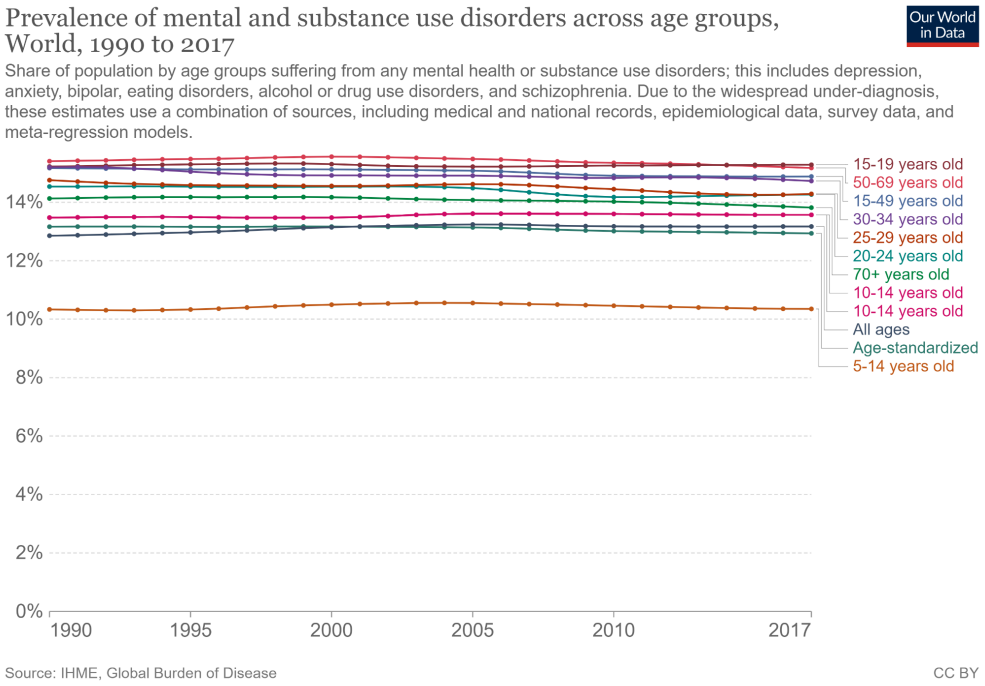
According to the target market, we should first set the target users as young office workers. They are often troubled by anxiety because they are new to the workplace, and most of them can't make an appointment with a psychologist because they often need to work overtime for personal financial reasons. At the same time, they have a strong ability to accept new technologies, so we should start from them, gradually optimize the system according to user feedback, and promote it to people of other ages after public praise.

3.2 Market Research

With the increase of social pressure, more and more people may be troubled by anxiety. According to the statistics of the World Health Organization (WHO), about 1 billion people around the world are suffering from mental disorders, and one person loses his life due to suicide every 40 seconds. Therefore, psychological counseling will be very important and will still be on the rise in the future society.

3.3 Market Value

With the increase of social pressure, more and more people may be troubled by anxiety. According to the statistics of the World Health Organization (who), about 1 billion people around the world are suffering from mental disorders, and one person loses his life due to suicide every 40 seconds. At the same time, people pay more and more attention to the importance of mental health and are willing to despise the conservative idea of discrimination and consult a psychologist. Therefore, psychological counseling will be very important and will still be on the rise in the future society.



Prevalence of mental and substance use disorders among different age groups

At the same time, the development of the Internet also gives people other choices different from the traditional clinic consultation. Online consultation can save users' waiting time and the price is low. In addition, people who are introverted or have different degrees of social phobia can avoid direct face-to-face contact with psychologists. Therefore, it can be regarded as a promising emerging direction.

3.4 Competitive Analysis

At present, the traditional face-to-face consultation is still the main mental health counseling service, so there is a certain degree of market vacancy in online counseling services. In addition, the current mainstream online counseling APP still focuses on the entry of psychologists, such as Xinli001. Therefore, our current main competitors are such APPs or websites for online counseling by psychologists.

At the same time, the main concern of users for such online services is that the transparency of the practice qualification of psychologists is not as transparent as that of traditional visiting psychologists, and there is a certain risk of being cheated. In addition, due to the different abilities of psychologists, some psychologists may not be able to guide customers to share their feelings like face-to-face dialogue, so the accuracy of diagnosis will be below. Finally, although the cost of online consultation is cheaper than that of traditional clinic consultation, the cost is still higher than that of online consultation for other diseases. Therefore, we can mainly start with the diagnostic accuracy and the cost of consultation, and compete with our competitors.

Ⅳ Commercial Mode

4.1 Operation Mode

Our administrator will regularly collect and upload new questionnaires and update the article library. At the same time, in addition to user feedback and complaints, we will also regularly test the chatbot by specially assigned personnel to find and repair vulnerabilities in time. We will also train according to the newly updated articles and questionnaires.

In the future, our administrator will record the user's consultation records and article reading records. For users who have visited too many times, a on special person may be assigned to contact them and ask whether they need additional assistance. If necessary, we will help contact a psychologist for counseling.

4.2 Product Promotion

Our primary promotion target is the young people in the metropolis. They are usually troubled by anxiety and various psychological problems, but most of them are reluctant to go to offline clinics for consultation due to a lack of funds and time. On the other hand, they are more open-minded and are more willing to try new technologies. Our strategy should be to put advertisements on employment platforms in big cities, and to promote them on social media, such as Tiktok, to attract young people.

In addition, we can also try to promote it on campus. Although most schools are now equipped with psychological counseling clinics, some students are still reluctant to go for consultation because they are afraid of rumors or that psychologists will inform counselors and parents. We can try to publicize the social groups on campus and give these students more choices.

4.3 Product Advantages

At present, there are not many online psychological counseling websites, and few use chatbots. Compared with the traditional face-to-face consultation, we can save users' appointments and waiting time. Compared with the online counseling website settled by psychologists, our free service saves more money and can avoid the risk of being cheated: after all, you can't guarantee that the online chat with you is a psychologist.

In addition, our website has absolute protection for users' privacy. Only you and the chatbot know your conversation, and our administrators only know your user ID and don't know your privacy, including your name. So users don't have to worry about gossip caused by information disclosure.

4.4 Development Prospect

At present, there are still few websites for online psychological counseling, and few use chat robots. Therefore, we face less competitive pressure. In addition, many employees are facing mental health problems and are willing to seek psychological counseling, and

chatbots are also a relatively new and rising technology. Thus, our website still has great development prospects.

In the future, we need to improve the accuracy of diagnosis and develop new functions to further tap the potential of products. We need to first make public praise among the target population, and then promote business to the whole society.

4.5 Potential Partners

We can consider cooperating with relevant psychology forums. This will facilitate the collection of questionnaires and articles. They can inform us when the latest public questionnaire or relevant articles are published, and even help us collect and classify them. We can also advertise and promote them with our website, or recommend users to post in their forums to ask for help at the end of the chat.

At the same time, we can also cooperate with the psychologist clinic. Their professional psychological experts will guide us to train our system to diagnose more accurately. At the same time, our administrator can also call those users who have repeatedly asked for help from our chatbot and ask if they need other help. For users with serious symptoms or urgent situations, we can recommend them to the corresponding cooperative clinic for offline consultation. If possible, these clinics may set priorities for our users.

Ⅴ Risk Analysis

5.1 Market Risk

At present, most people are more confident in face-to-face diagnosis, and some conservatives are skeptical or even hostile to machine learning. This is undoubtedly the risk that our products need to face in the initial stage. In addition, some users may distrust our privacy protection, which may even rise to the policy level, and introduce relevant policies to rectify or even ban online psychological counseling, whether it is a resident psychologist or our chatbot. This is also the biggest risk we need to face at present. As some unscrupulous websites do cheat personal information, we can only protect the privacy of our users to reverse the reputation and cut with those fraudulent websites to avoid being affected at the same time.

In addition, we also need to face the risk of competition from other peers. If the products of other peers can achieve more accurate diagnoses or provide better services, we will undoubtedly be robbed of customers. Therefore, we need to constantly optimize and update our system.

5.2 Product Risk

At present, we need to face the risk of inaccurate product diagnosis. If our chatbot just can't conclude, the consequences may still be controllable. Once misdiagnosis occurs, the

consequences are unimaginable. Therefore, on one hand, we need to try to improve the accuracy of diagnosis, on the other hand, we need to increase the scope and categories of the questionnaire to provide more information for our system.

At the same time, compared with the traditional psychological counseling clinics, our products are not attractive enough, so we need to avoid direct competition with them and strive for the possible remaining customers. In contrast, psychologists' diagnoses will be more accurate, the diagnosis results will be more authoritative, and the reputation will be better so that customers are not easily deceived. These make their attraction higher than ours. However, they require more fees, and the appointment time may be longer. We can start from this aspect to attract people who don't have enough money or time.

5.3 Financial Risk

Our products may indeed have financial risks, especially in early development and testing. Because in the early stage, it needs a free trial, so it can't be profitable in the early stage. Therefore, we should improve and optimize products and accumulate user reputation, and try to cooperate with other platforms for advertising and charge a certain advertising fee at the same time. After basically improving the function and determining the user base, we can try to launch the VIP function and add some new functions based on free permission.

5.4 Technical Risk

A major technical difficulty is that it is difficult to find a suitable and comprehensive corpus of psychological diagnosis chatbots. At the same time, how to build and train our model to diagnose more accurately is also a technical problem we need to face. These two aspects can be regarded as technical risks, so there need to be some alternatives, such as detecting emotional information in chat, measuring it every five sentences, and then classifying it, or designing some other medical projects.

At the same time, we also need to protect our database, especially user data from attacks. This is part of our protection of user privacy. This is also a technical risk we need to face because we need to find appropriate methods to ensure the security of databases and systems.

Ⅵ Team Management

6.1 Team Composition

We are a four-member group and our leader is Wu Junxian and he is in charge of the chatbot building. In addition to him, we also have Wang Kedi who is responsible for writing the article system and DB building, Ying Zhuozuo who is in charge of WEB building and questionnaire collecting, Zong Jiulin who is responsible for user and administrator interface designing and article collection.

Besides, for the document writing part, Wu Junxian is responsible for the server, domain name, WordPress display, and Risk Analysis. Wang Kedi is in charge of Market Analysis, Ying Zhuozuo is responsible for Background and Team Management, and Zong Jiulin is in charge of Commercial Mode. We used Worktile (A professional project management software) for planning and monitoring the progress of each team member

6.2 Team Development

For the future team expansion plan, we hope to recruit a front-end designer and a database designer. In the current project team, our four inexperienced members are a little hard to take charge of the development. It would be good if we could share the pressure with several more team members.

After the product is officially launched, we may recruit several more system maintenance staff to be responsible for subsequent system maintenance and optimize the model with us. In addition, we also need to recruit administrators to be responsible for user management, subsequent collection and upload of questionnaires and articles, and communicating with some users.

Ⅶ Product Promotion

For almost all software, it takes a certain period from being ignored at the beginning to becoming a household name later. This period can be roughly divided into three stages: early stage, middle stage, and late stage. No matter which stage, it is very important to promote the product. Only when the product is well promoted can the popularity of the product be improved and a better market is obtained. For different stages, the promotion methods are also different.

7.1 Early Stage

At this stage, the company's financial, human resources, and other resources are not very sufficient, and the popularity of the product is not high, so the first thing to do is to cover as many areas as possible with the minimum cost, to let more people know the product and improve the popularity as soon as possible. In the early stage, the product is mainly promoted online and offline.

7.1.1 Online

7.1.1.1 App Store Promotion

Telecom operator application store: operator channels refer to Singtel, Starhub, and Mobile One. Their main advantage is that they have a large user base. We can provide certain funds to obtain the support of operators so that we can promote the product in a large range and obtain higher popularity.

Software download stations: we can make our system into apps and submit at some software download stations, such as the IOS App store, Baidu software center, Google play,

etc. many users are using these download stations, and we can have more opportunities to obtain users

7.1.1.2 Inner Application Promotion

Intra application push: It is to exchange traffic through BD cooperation. We can cooperate with other apps and promote each other. This way can make full use of data traffic and increase exposure and download. Although the magnitude is small, the exposure is good. Mutual push in this way needs to be based on a certain number of users, but if we can't bring data traffic to other products or the volume is very small, we can find the website advertising alliance to run data traffic in exchange for high-quality resource bits in the app store or convert it into money for promotion. This way is more practical. Stores including Xiaomi can exchange data traffic, Through some agents, you can also exchange data traffic with 360, which may have a better effect than CPT directly at 360.

Pop-up promotion: we can add some pop-up promotions on some pages. When users browse the page, the pop-up window will appear for a short period and then disappear automatically. In this way, users will not be disgusted, and they can also notice the content on the pop-up window so that more people can understand our product.

Focus map promotion: focus map is a picture or multiple pictures displayed in the application. In an obvious position in the application (generally used on the application home page or channel home page), promote their application in the form of picture combination. Because it is in the form of pictures, it has certain attraction and visual attraction, which can attract the attention of more users.

Inserted advertisement: we can trigger full screen/half screen pop-up or embedding when users use other apps. In this way, the click-through rate, conversion rate, and user activity are very good. We can skillfully avoid the user's normal experience of the application by popping up in the form of a half screen or full screen when the application is opened, paused, and exited. This kind of advertisement has a very high click-through rate because of its large size and shocking visual effect, which can make our product more famous.

7.1.1.3 New Media Promotion

Brand basic promotion: we can establish brand entries in Baidu Encyclopedia and Wikipedia, or establish Q & A on Zhihu or Quora and other similar websites.

Forum promotion: we can post promotion in two ways: official post and user post to improve our popularity. At the same time, we can contact the forum administrator to do some promotion activities. After posting, we should regularly maintain our posts, answer the questions raised by users in time, and collect feedback information from users to update and improve.

WeChat promotion: we can first combine product recommendations with content, then accumulate the seeds users. After that, we can open subsidiary accounts, guide target customers every day, and accumulate WeChat official accounts through subsidiary accounts, and guide fans into the WeChat official account. Similarly, we can also promote it directly

through WeChat groups. Users can receive red envelopes by downloading products. This way can greatly increase the download volume of products.

7.1.2 Offline

We can cooperate with some small-scale businesses with similar scale and nature. They provide us with data and information and promote our product to more people. We use our platform to promote their products. In this way, when we help them achieve more profits, we can also have higher popularity and achieve win-win.

We can also promote in various exhibitions. For example, visitors can get small gifts by registering an account. In this way, we can also accurately find potential users of the product or cooperate with other stores to recommend downloading and reducing some bills when customers check out, to attract customers to use our product.

We can also promote in some shopping malls and other appropriate places, and the promotion effect of this way is more obvious. Similarly, we can also print the QR code on the desk calendar, leaflet page, poster, and other places to increase the number of users.

7.2 Middle Stage

During this period, our human and financial resources have improved to a certain extent, and our popularity has also increased. Therefore, we can increase the investment of funds and further promote the product.

7.2.1 Online

7.2.1.1 Socialized Marketing

We can build a marketing team with strong executive power, find a topic that can attract users, implant it into fast-moving words, pictures, and videos in a relatively soft way, and spread it in major SNS communities to get high explosive traffic.

7.2.1.2 Data Analysis

Promotion at any time is inseparable from data. We should learn to find problems from data, summarize good experiences, make high-quality channels, further optimize products and attract more users.

7.2.2.3 Content and Advertorial

We also need to publish a large number of articles related to products and combined with hot news on some well-known websites, and we can also publish relevant articles describing product functions, to make more people understand and use our website.

7.2.2 Offline

We can cooperate with some well-known medium-sized enterprises and companies to increase the success rate of cooperation by introducing them to the previous successful cases of win-win cooperation. Through their publicity, we can obtain more users and higher popularity.

We can go to large-scale offline stores for promotion, such as cooperating with McDonald's and KFC. For example, users can get a free KFC cola by registering an account.

We can also sponsor some large-scale activities related to products in our city. These activities often have many people who pay attention to them, and there will be tracking reports by relevant media, which can greatly enhance the popularity of our products.

7.3 Late Stage

During this period, our financial resources and other aspects have been greatly improved, and we can use more funds for further promotion.

7.3.1 Online

7.3.1.1 Event Marketing

Event marketing requires a keen sense of smell for industry information. Superficially, it is hype, which requires our team to have certain media resources. On this basis, we can create some events to attract people's attention, to better improve the popularity of the product.

7.3.1.2 Celebrity Forwarding

We can cooperate with some well-known celebrities to forward and recommend our products, and we will give them corresponding remuneration. Such a leading role can make the popularity of the product rise sharply.

7.3.2 Offline

Cooperation with well-known enterprises: various ways such as playing each other's funds or business cooperation can be used to further enhance the popularity.

Invest in and sponsor TV programs: for example, launch a variety entertainment program, invite well-known guests to obtain higher ratings, and then make more people interested in our products and play a better role in promotion.

Technique Part:

Ⅰ Database:

1.1 Database Environment

Database System:	MySQL 8.0.27
Database Management Software:	Navicat Premium 15
Operating System:	Windows 10
Network Protocol:	TCP/IP

1.2 Entity Design

User:

User_id:	User account
Gender:	User gender
Password:	User password

Administrator:

Admin_id:	Administrator account
Password:	Administrator account

Article:

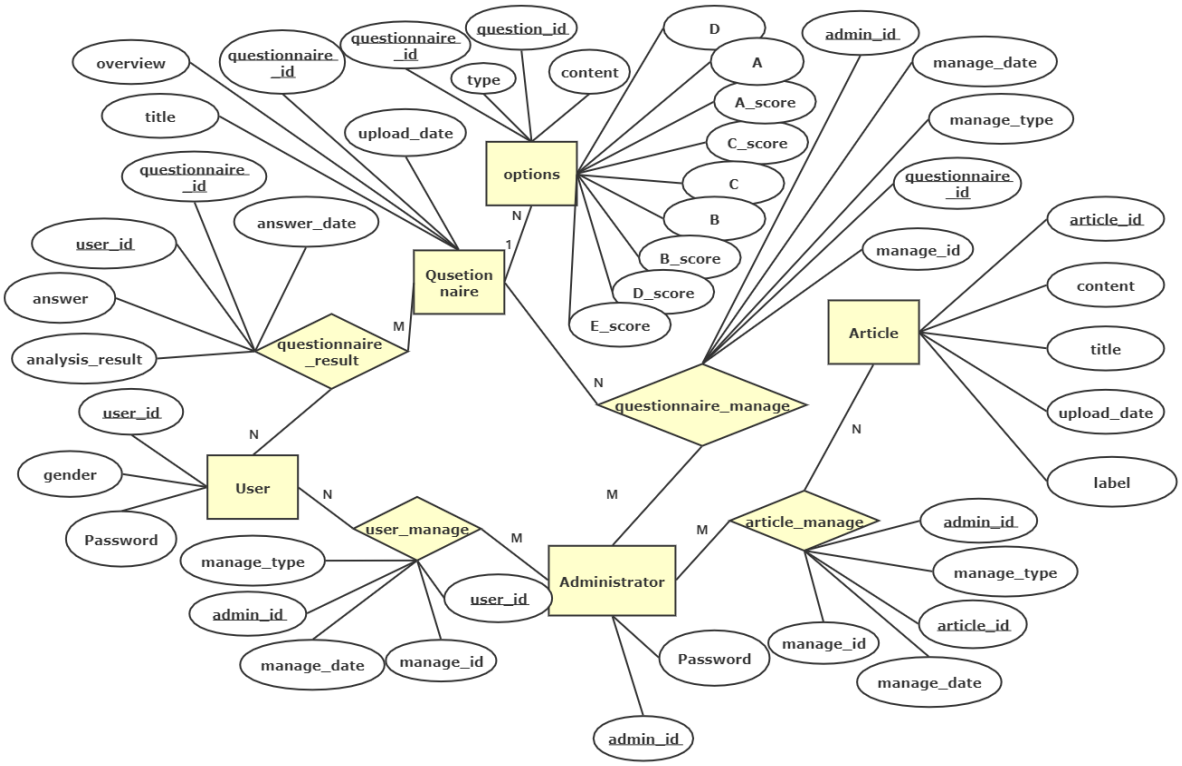
Article_id:	Article identification number
Content:	Article content
Title:	Article title
Upload_date:	Date of uploading article
Label:	Article classification label

Questionnaire:

Questionnaire id:	ID number of questionnaire
Title:	Questionnaire title
Overview:	Abstract of questionnaire
Upload_date:	Date of uploading questionnaire

Options:

Questionnaire id:	ID number of questionnaire
Question_id:	ID number of question
Content:	Question content
A-E:	Option content
A_Score-E_score:	Score of option
Type:	Question classification type



ER Diagram of Imental Database

1.3 Relation Design

User_manage: Administrator's management of users

User_id: User account
Admin_id: Administrator account
Manage_type: Operation type
Manage_date: Operation date
Manage_id: ID number or this operation

Article_manage: Administrator's management of articles

Article_id: Article identification number
Admin_id: Administrator account
Manage_type: Operation type
Manage_date: Operation date
Manage_id: ID number of this operation

Questionnaire _manage: Administrator's management of questionnaires

Questionnaire id: ID number of questionnaire
Admin_id: Administrator account
Manage_type: Operation type
Manage_date: Operation date
Manage_id: ID number of this operation

Questionnaire _result: Results of the user's answer to the questionnaire

Questionnaire_id: ID number of questionnaire

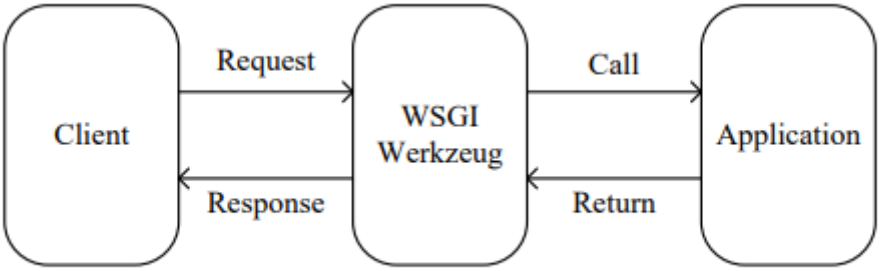
User_id:	User account
Answer_date:	Date of filling questionnaire
Answer:	Answers to the questions
Analysis_result:	analysis result based on the answers

Ⅱ Front-end Development:

2.1 Flask

Flask is a lightweight web application framework written in Python. The main feature of the be Flask framework is that the core composition is relatively simple, but it has strong scalability and compatibility. Programmers can quickly implement a website or web service using Python language.

The basic mode of Flask is to assign a view function to a URL in the program. Whenever the user accesses the URL, the system will execute the view function assigned to the URL, obtain the return value of the function and display it on the browser.



Working process diagram of Flask framework

In our project, we chose Flask to be our front-end framework, including the web page development and access to the database.

2.2 HTML & CSS

HTML is a standard markup language for creating web pages. Web browsers can read HTML files and render them into visual web pages. HTML describes the structure and semantics of a website. With the presentation of clues, it becomes a markup language rather than a programming language.

HTML elements are the cornerstone of building a website. HTML allows embedding images and objects and can be used to create interactive forms. It is used to structure information - such as titles, paragraphs, lists, etc., and to describe the appearance and semantics of documents to a certain extent.

CSS cannot be used alone. It must work together with HTML or XML to decorate HTML or XML. Html is responsible for determining what content is on the web page, and CSS determines how to present these elements. CSS can be used to set the page layout, set the page element style, and set the global style applicable to all web pages.

The most important goal of CSS is to separate the content of a file from its display. Before CSS appeared, almost all HTML files contained the information displayed in the file. They were listed in the HTML file, sometimes repeatedly. CSS allows authors to isolate most of this information and simplify HTML files. This information is placed in an auxiliary file written in CSS language. HTML files only contain structure and content information, and CSS files only contain style information.

2.3 Javascript

JavaScript is a language based on prototypes and first-class functions. It is a multi-paradigm language. It supports object-oriented programming, instruction programming, and functional programming. It does not support I / O, but these can be supported by its host environment. JavaScript is an object-based and event-driven explanatory scripting language, which is directly embedded in HTML pages, interpreted, and executed by browsers without precompiling.

In this project, we used HTML to design the web page and used CSS to set the detailed margin size, text size, etc. As for Javascript, it is used for logic and activity designing like pressing buttons of questionnaires.

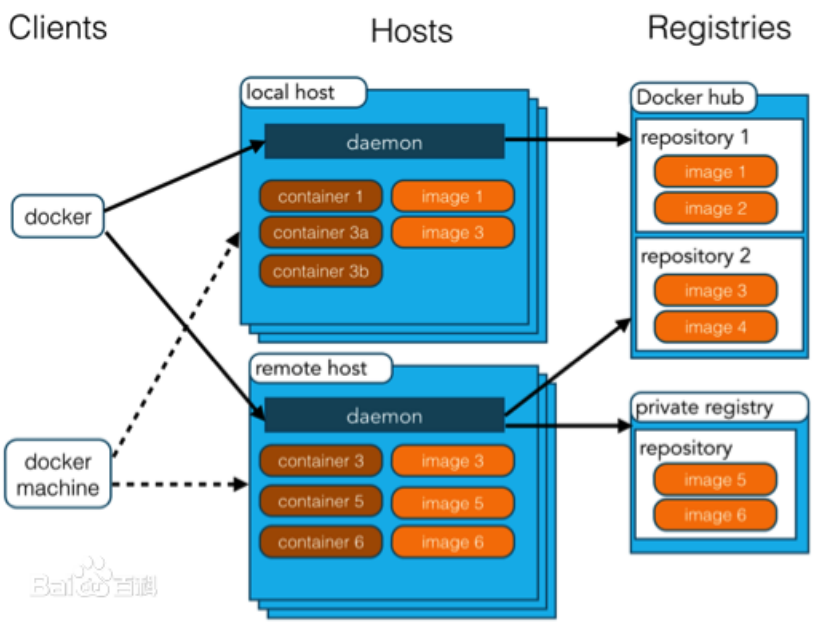
Ⅲ Model Design and Platform Used:

3.1 Platform

3.1.1 Docker

Docker is open-source software and an open platform for developing shipping and running applications. Docker containers are similar to virtual machines, but they differ in principle. The container virtualizes the operating system layer, and the virtual machine is the virtualized hardware. Therefore, the container has more portability and makes more efficient use of the server. Containers are more used to represent a standardized unit of software. Due to the standardization of containers, they can be deployed anywhere regardless of infrastructure differences.

Docker uses client-server (C/S) architecture mode and remote APIs to manage and create Docker containers. Docker containers are created through docker images. The relationship between container and image is similar to that between object and class in object-oriented programming. Docker adopts C/S architecture. Docker daemon is used as the server to accept requests from customers and process these requests. Docker daemon generally runs in the background of the host, waiting to receive messages from the client. Docker client provides users with a series of executable commands. Users can use these commands to interact with the docker daemon.

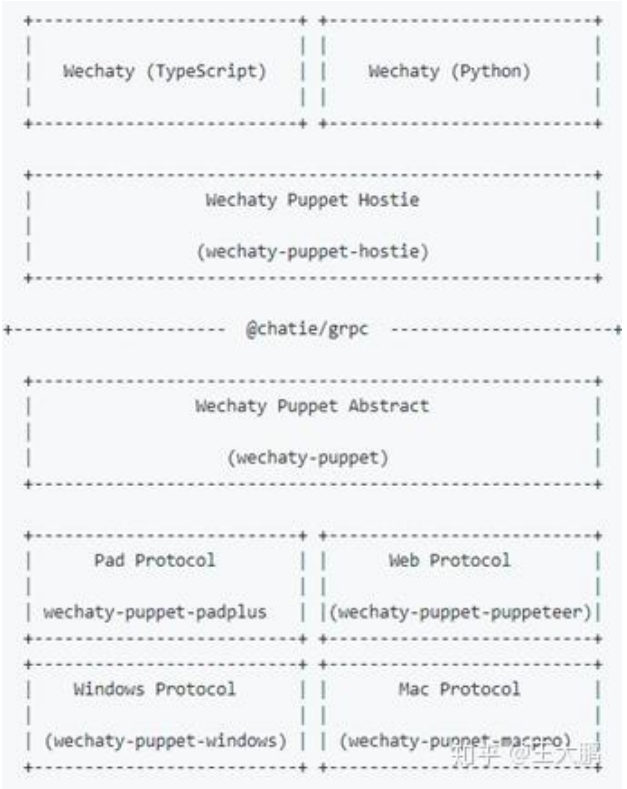


Docker Structure

Docker is also a must in deploying Wechaty Puppet Hostie, as the Wechaty team supports fast deployment based on docker, which is very convenient.

3.1.2 What

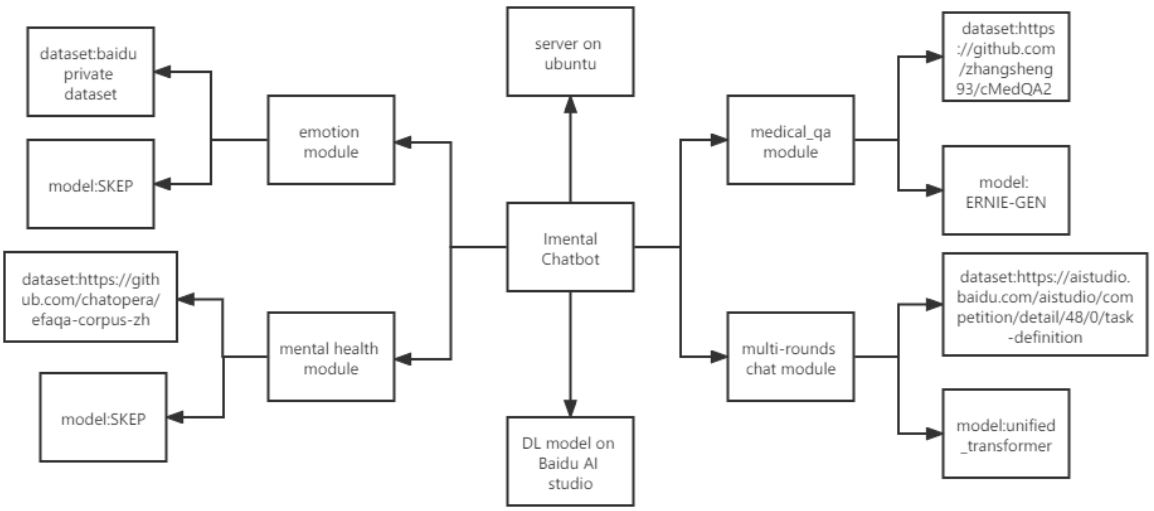
According to the official document, What is a Conversational SDK for Chatbot Makers which can help you create a bot in 6 lines of javascript, Python, Go, and java, with cross-platform support including Linux, Windows, macOS, and Docker. The disadvantage is that the bottom layer is mainly developed based on the emotion-based basic skip-gram point-of-view node multi-label, so the relevant documents of other languages need to be gradually improved. In addition, we need to apply for a token to use, and the probation period is 15 days.



The basic emotion-based skip-gram point-of-view structure of What

According to the official document, the term Puppet in Wechaty is an Abstract Class for implementing protocol plugins. The plugins are the component that helps Wechaty to control Wechat. The plugins are named XXXPuppet, like PuppetPuppeteer is using the chrome puppeteer to control the WeChat Web API via a chrome browser, PuppetPadchat is using the WebSocket protocol to connect with a Protocol Server for controlling the iPad Wechat program.

3.2 Model

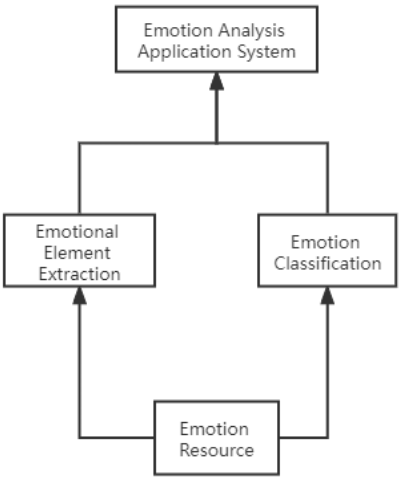


The final structure of Imental Chatbot

3.2.1 Text Emotion Recognition

The emotional expression consists of four elements, namely holder, target, polarity, and time, in which the time of text publication can usually be obtained by simple rules. Therefore, the goal of the emotional analysis is to automatically analyze the three elements of the holder (viewpoint holder), target (evaluation object), and polarity from unstructured text.

The emotion classification system will be different, usually including praise and criticism, happiness, anger, sadness and fear, emotion scoring (such as 1-5 points), etc. The emotion in the text is divided into explicit emotion and implicit emotion. Explicit emotion refers to the emotional text containing obvious emotional words (such as happy and beautiful), and implicit emotion refers to the emotional text without emotional words.



Structure of emotion analysis

3.2.2 Text Emotion Classification

The purpose of text emotion classification is to judge the emotion category of a given sentence or text, also known as coarse-grained emotion analysis. Text emotion classification is the ultimate goal of emotion analysis. It can usually classify the emotion of sentences or chapters based on the extraction of emotional elements. In recent years, due to the rise of deep learning, it can cross the extraction process of emotional elements, avoid cascading errors, and make end-to-end emotional analysis possible. The existing research work can be roughly divided into emotion based dictionaries and feature-based learning methods.

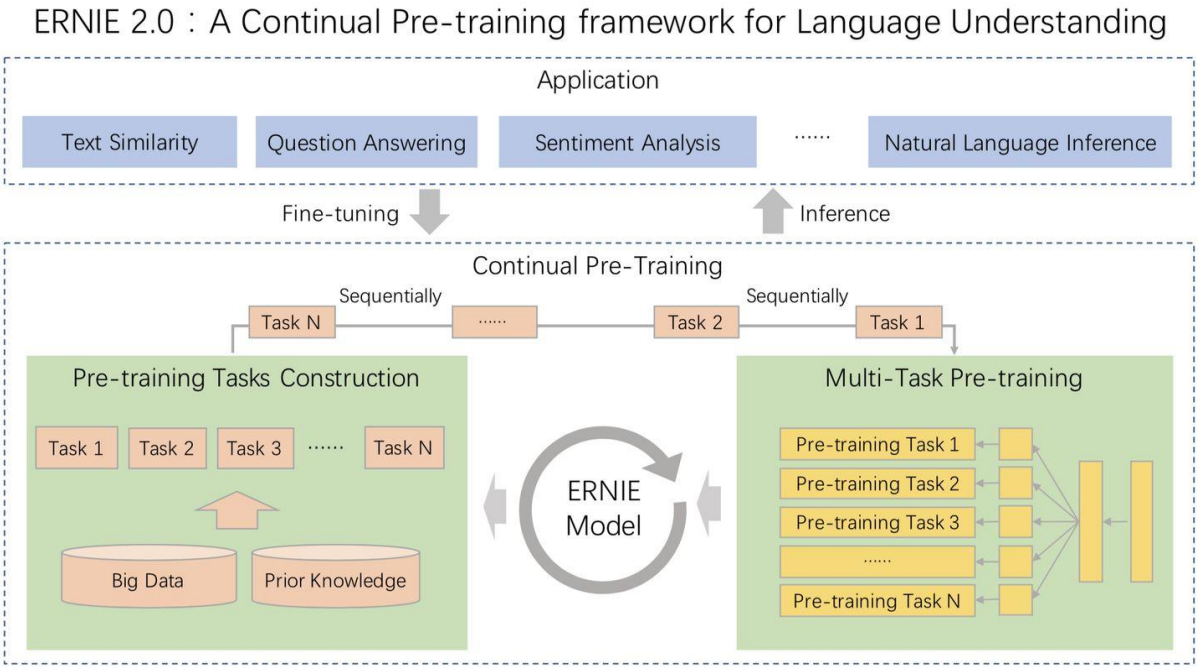
We tried machine learning and deep learning respectively. For machine learning, firstly, we extracted the word2vec weighting of the text and then classified the extracted features by SVM. For deep learning, we used transformer as the backbone, finetuned, and tried ERNIE and SKEP.

```
ch_txt="哎我晚上一直睡不着怎么办呀"
data=[{'text':str(ch_txt),'qid':''}]
```

Mental Health Classification

3.2.2.1 ERNIE

After Google's Bert, Baidu has improved the Bert model and proposed a knowledge-enhanced pre-training model ERNIE 1.0. Compared with the original language modeling at the Bert word level, ERNIE 1.0 directly models the a priori semantic knowledge unit, that is, uses the mask logic of full word coverage, to enhance the semantic representation ability of the model. On this basis, Baidu also proposed a semantic understanding pre-training framework ERNIE 2.0 based on continuous learning, which uses multi-task learning to build pre-training tasks incrementally. It can obtain the natural language information of morphology, syntax, semantics, and other dimensions from the training data, and further enhance the general semantic representation ability.



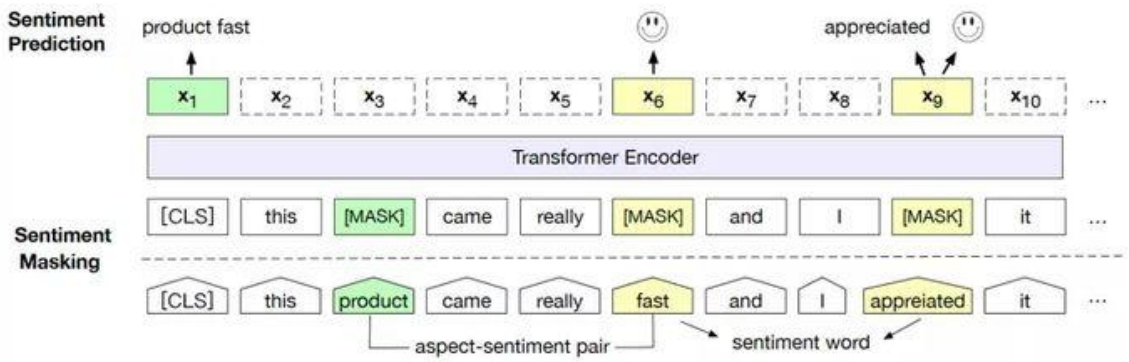
Structure of ERNIE

3.2.2.2 SKEP

Firstly, SKEP automatically mines emotional knowledge from a large number of unmarked data based on statistical methods, including emotional words, emotional word polarity, and opinion collocation.

Then, based on the automatically mined emotional knowledge, SKEP masks some words in the original input sentence, that is, replaces them with special characters [mask]. In addition to shielding words or continuous fragments like traditional pre-training, SKEP also blocks the skip gram of point of view collocation.

Finally, SKEP designs three emotion optimization objectives, which require the model to recover the blocked emotion information, including viewpoint matching prediction based on multi-label optimization, emotion matching; Affective word prediction; Emotional polarity classification.



Structure of SKEP

3.2.3 TF-IDF

TF-IDF (the inverse document frequency) is a commonly used weighted technique for information retrieval and data mining. Tf is a word frequency (term frequency), idf is the inverse text frequency index (inverse document frequency).

TF-IDF is a statistical method used to assess the importance of a word to one of the documents in a document set or a corpus. The importance of a word increases with the number of times it appears in the document but decreases inversely with the frequency of its occurrence in the corpus. Various forms of TF-IDF weighting are often applied by search engines as a measure or rating of the degree of correlation between files and user queries. In addition to TF-IDF, search engines on the Internet also use rating methods based on link analysis to determine the order in which documents appear in search results.

[3]:
```
def keyword_extract(path):
    file = open(path,"rb")
    sent = file.read()

    print('TF-IDF')
    t = jieba.analyse.TFIDF()
    kws = t.extract_tags(sent,topK=10, withWeight=True,allowPOS=('ns','n','vn','v','a'))
    word_list = []
    for word,weight in kws:
        #print("%s"%(word))
        word_list.append(word)
        print("%s %.4f"%(word,weight))
    return word_list
```

[4]:
```
word_list1 = keyword_extract("test.txt")
word_list1
```

```
TF-IDF
Building prefix dict from the default dictionary ...
Loading model from cache C:\Users\Wang\AppData\Local\Temp\jieba.cache
Loading model cost 1.330 seconds.
Prefix dict has been built successfully.
关系 0.2611
亲密关系 0.1964
过渡期 0.1749
对方 0.1683
伴侣 0.1181
热恋 0.0985
付出 0.0726
可能 0.0705
满意度 0.0610
沟通 0.0610
```

[4]: ['关系', '亲密关系', '过渡期', '对方', '伴侣', '热恋', '付出', '可能', '满意度', '沟通']

Keyword Extraction

3.2.4 Text Similarity Matching

Generally speaking, the input of a text similarity calculation task is two documents. The output is the similarity of two documents, which is usually expressed by decimals in the [0,1] interval. Text similarity calculation methods are divided into supervised and unsupervised:

The supervised method is to use supervised models such as naive Bayesian classifiers to judge text similarity or calculate similarity. This kind of method requires a certain number of the labeled corpus, and the construction cost is relatively high. Because the training corpus is usually not large enough and the generalization of the model is not enough, it will be a little troublesome to use in practice. The complexity of distance calculation will be high.

The unsupervised method is to uses questionnaires wikiHowstance and other methods to directly calculate the distance or similarity between texts. The characteristics of this method are: there is no need to label the corpus, and large data can be used in feature engineering or parameter estimation. Many methods rely less on language and can deal with multilingual mixed scenes. Thus, the complexity of distance calculation is low.

```
#test_token_embedding = token_embedding.search("焦虑")
from collections import Counter

def get_order_dict_N(_dict, N):
    result = Counter(_dict).most_common(N)
    d = {}
    average = 0
    for k,v in result:
        d[k] = v
        average = average + v
    return average/N,d

# txt_list=['中国人','美国汽车','中国','中国是一个国家','你好']


def search_list(input_txt,target_list,method='cosine',topk=5):
    dic={}
    score=[]
    for txt in target_list:
        dic[txt]=token_embedding.cosine_sim(input_txt, txt)
    return get_order_dict_N(dic,topk)

print(1,search_list('焦虑',word_list1,method='cosine',topk=5))
print(2,search_list('焦虑',word_list2,method='cosine',topk=5))
print(3,search_list('焦虑',word_list3,method='cosine',topk=5))
print(4,search_list('焦虑',word_list4,method='cosine',topk=5))
print(5,search_list('焦虑',word_list5,method='cosine',topk=5))
print(6,search_list('焦虑',word_list6,method='cosine',topk=5))
```

```
1 (0.345146644115448, {'亲密关系': 0.41248652, '热恋': 0.3554591, '可能': 0.32720622, '满意度': 0.32137865, '沟通': 0.30920273})
2 (0.4570730566978455, {'情绪': 0.69757235, '觉察': 0.40841025, '敏感': 0.39597133, '人群': 0.39422742, '误解': 0.38918394})
3 (0.38344801068305967, {'孩子': 0.4247513, '创伤': 0.39788967, '过度': 0.39754805, '父母': 0.35261762, '代际': 0.3444334})
4 (0.5477967083454132, {'焦虑': 1.0000001, '感到': 0.4842094, '负面': 0.46975103, '过度': 0.39754805, '状态': 0.38747495})
5 (0.40388732552528384, {'负面': 0.46975103, '冲突': 0.43605098, '亲密关系': 0.41248652, '应对': 0.3693148, '建设性': 0.3318333})
6 (0.38380764722824096, {'冲突': 0.43605098, '亲密关系': 0.41248652, '行为': 0.37238505, '信念': 0.3701144, '预判': 0.3280013})
```

Text Matching

Ⅳ Challenges and Innovations:

4.1 Database

For database designing, the first challenge is the table of questions and questionnaire, including its relation. At first, we only designed a questionnaire table and hoped to store all

questions (including their options), and separate them with different separators to distinguish different questions and options when reading in. However, this method can be quite troublesome in inserting questionnaires and can easily cause errors if there are mistakes in the texture, like using a wrong separator.

Then we considered making a question table and storing the questions' id in the questionnaire table. Then a similar question appeared as to how to store questions of different types, such as single choice questions and multi-choice questions. We tried to store all options in texture and divide them with separators. However, we still need to face the challenges in the former methods. Besides, as there are scores for different options, we need to make another texture for scores and consider how to relate them with options.

Finally, we abandoned the multi-choice questions and kept only the single-choice ones. We set five options for questions (A to E), along with their scores (A_value to E_value). If there are less than five options in question, the last options and values are set to null. This will limit the categories of questions in questionnaires, and we will try to solve them in the future.

4.2 Front-end

The difficulty in this part is mainly how to realize the interworking between the database and the web page. Finally, we read the data in the database through a query. all() and push it to the template through entries. Another challenge is to realize the click trigger operation of the button. Finally, we realize it through JavaScript activity.

4.3 Model and Chatbot

We'd like to do an Imental website from general area to specific area. However, we also faced several difficulties in modeling and building chatbots.

4.3.1 How does text classification detect emotion?

Using paddle NLP-task flow, we can get basic info of positive or negative tests. paddle NLP-task flow covering the natural language understanding and the natural language to generate two core applications, providing industry-level effects and ultimate prediction performance on Chinese scenes.

```
I1024 19:45:26.609752 16164 analysis_config.cc:424] use_dlnne_:0
[{'text': '还看十分激动的心情放晚，可是看看看看发现，在刚刚定评后，出现一张半老的动画片', 'label': 'negative', 'score': 0.6691398620605469}]
```

But for mental health, we may need a more specific idea. We choose the Emotional First Aid Dataset We use word2vec to extract the feature and then use SVM to do classification then we would give each post 3 labels for our recommendation. Because it is quite an imbalanced dataset, the results are not very good.

4.3.2 How to make a portable chatbot?

Wechaty is the only RPA chatbot maker that provides conversational chatbots with quick setup through 6 lines of code.
It can be used in the traditional media account and Quick | Cross-platform | Easy to use

4.3.3 How to realize Several rounds of talks?

4.3.3.1 One-round simple Q&A base on text_generation with GPT model

Before input into the pre-training model, text data needs to be transformed into Feature through data processing, which usually includes word segmentation, token to ID, add special token and other steps, we use Baidu pre-trained model GPTChineseTokenizer to change our text input to feature vector (The GPT bottom is also based on the Transformer model, which is different from the Transformer model for translation tasks: it only uses multiple DECODER layers.)

```python
import paddle

user_input = "一加一等于" #chinese input

# text to ids
input_ids = tokenizer(user_input)['input_ids']
print(input_ids)

# id2tensor
input_ids = paddle.to_tensor(input_ids, dtype='int64').unsqueeze(0)
print(input_ids)
```

```
[44, 530, 44, 5263]
Tensor(shape=[1, 4], dtype=int64, place=CUDAPlace(0), stop_gradient=True,
       [[44  , 530 , 44  , 5263]])
```

Then we use the Baidu pre-trained model 'gpt-CPM-large-cn' to interface our input and choose the best output.

```python
# chiese GPT model
ids, scores = model.generate(
                input_ids=input_ids,
                max_length=16,
                min_length=1,
                decode_strategy='greedy_search')

generated_ids = ids[0].numpy().tolist()

# id2text
generated_text = tokenizer.convert_ids_to_string(generated_ids)
print(generated_text)
```

```
二,二加一等于三,三加一等于四
```

4.3.3.2 Multi-rounds chatbot based on Unified Transformer

Unified Transformer uses the transformer's encoder as the network basic component, adopts a flexible attention mechanism, is very suitable for text generation tasks, and adds special token identifies different conversation skills to the model input so that the model can also support idle talks, recommend dialogue and Knowledge dialogue.

```python
from utils import select_response

# select the best answer
result = select_response(ids, scores, tokenizer, keep_space=False, num_return_sequences=20)
print(result)
```

```
['你好啊,我今年23岁,你多大了啊?']
```

4.3.4 How to realize medical Q&A?

We used cMedQA2, which is an updated version of the dataset for Chinese community medical question answering.

Finetune with ERNIE-GEN, Ernie-Gen is a pre-training-fine tuning framework for generating tasks. The first time you join the span-by-span generation task in the pre-training phase, allowing the model to generate a semantic complete segment each time. The exposure deviation problem is mitigated by the filling generation mechanism and noise perception mechanism in pre-training and fine-tuning. In addition, Ernie-Gen samples multiple segments - multi-gratitude target text sampling strategy, enhance the correlation between the source text and target text, and enhances the interaction of encoder and decoder.Ernie_gen Module is a Module with fine-tuning capabilities that quickly complete the production of a specific scenario Module.

```python
import paddlehub as hub
import os

os.environ["CUDA_VISIBLE_DEVICES"] ="0"

module = hub.Module(name="ernie_gen_ch_med_save")

test_texts = ["头晕"]
# generate包含3个参数，texts为输入文本列表，use_gpu指定是否使用gpu，beam_width指定beam search宽度，
results = module.generate(texts=test_texts, use_gpu=True, beam_width=5)
for result in results:
    print(result)
```

```
[2021-10-20 11:02:06,020] [    INFO] - Already cached /home/aistudio/.paddlenlp/models/ernie-1.0/ernie_v1_chn_base.pdparams
[2021-10-20 11:02:06,023] [   DEBUG] - init ErnieModel with config: {"attention_probs_dropout_prob": 0.1, "hidden_act": "relu", "hidden_dropout_prob": 0.1, "hidden_size": 768, "initializer_range":
0.02, "max_position_embeddings": 513, "num_attention_heads": 12, "num_hidden_layers": 12, "type_vocab_size": 2, "vocab_size": 18000, "pad_token_id": 0}
[2021-10-20 11:02:06,096] [    INFO] - loading pretrained model from /home/aistudio/.paddlenlp/models/ernie-1.0/ernie_v1_chn_base.pdparams
[2021-10-20 11:02:06,525] [    INFO] - param:mlm_bias not set in pretrained model, skip
[2021-10-20 11:02:06,528] [    INFO] - param:mlm.weight not set in pretrained model, skip
[2021-10-20 11:02:06,530] [    INFO] - param:mlm.bias not set in pretrained model, skip
[2021-10-20 11:02:06,533] [    INFO] - param:mlm_ln.weight not set in pretrained model, skip
[2021-10-20 11:02:06,535] [    INFO] - param:mlm_ln.bias not set in pretrained model, skip
[2021-10-20 11:02:07,500] [    INFO] - Found /home/aistudio/.paddlenlp/models/ernie-1.0/vocab.txt

['头晕可能是感冒，脑缺血，贫血，美尼尔氏综合征，心律失常，休息的时间和质量不好，都是可能导致的。需要长', '头晕的原因很多，休息不好，精神紧张，也容易引起头晕，还有其他如:颈椎病，心血管疾病，美尼尔氏综
合症', '头晕的原因很多，休息不好，精神紧张，也容易引起头晕，还有其他如:颈椎病，心血管疾病，美尼尔氏综合征', '头晕的原因很多，休息不好，精神紧张，也容易引起头晕，还有其他如:颈椎病，心血管疾病，美尼尔
氏综合症', '头晕可能是感冒，脑缺血，贫血，美尼尔氏综合征，心律失常，休息的时间和质量不好，都是可能导致的。需要长']
```

4.3.5 How to realize multi-language?

Since the key dataset we use is the Chinese training dataset. So we would detect the language you use first, then we will translate it to Chinese and after our NLP model, we would translate it back to the language you use. In the future, if possible to collect mental health Q&A from other languages we would expand our model zoo.

This is what we use by Baidu:

```python
print(translate2auto("Guten Tag!", "auto", "en"))
print(translate2auto("study hard", "auto", "en"))
print(translate2auto("everything will be ok", "auto", "zh"))
```

```
Guten Tag!
{'from': 'de', 'to': 'en', 'trans_result': [{'src': 'Guten Tag!', 'dst': 'Good afternoon.'}]}
('de', 'Good afternoon.')
study hard
{'from': 'en', 'to': 'en', 'trans_result': [{'src': 'study hard', 'dst': 'study hard'}]}
('en', 'study hard')
everything will be ok
{'from': 'en', 'to': 'zh', 'trans_result': [{'src': 'everything will be ok', 'dst': '一切都会好起来的'}]}
('en', '一切都会好起来的')
```

4.4 Other Issues

4.4.1 How to create a commercial website?

WordPress is a free open source blog software and content management system for PHP and MySQL.WordPress has a plug-in architecture and a template system. As of April 2018, more than 30.6% of the top 10 million websites use WordPress.WordPress is the most popular website content management system. There are about 30% of websites worldwide (5,000) to use WordPress to set up sites. WordPress is the most popular blog system on the Internet. WordPress stands out in the most famous network issuance phase. Today, it is used in more than 70 million sites.

4.4.2 How about some specific area?

We are still working on it. And make autism children be our first demo. Take autism for example:

Using scale and children's image photos to do the classification. If the confidence of two added is above 90% we highly recommend you to see a doctor.

Using textCNN+BILSTM+ATTENTION to do the autism children stereotype classification.

Appendix:

Ⅰ Project Proposal

Date of the proposal: **31/08/2021**
Project Title: Imental

Group ID (As Enrolled in LumiNUS Class Groups):

13

Group Members (Name, Student ID):

WU JUNXIAN -- A0231293L

WANG KEDI -- A0231356L

YING ZHUOZUO -- A0231534N

ZONG JIULIN -- A0231352U

Sponsor/Client: *(Company Name, Address, and Contact Name, Email, if any)*

Background/Aims/Objectives:

Background

With the development of technology, chatbots for advertising and entertainment are becoming a new trend.

However, very little attention is paid to psychology, which causes us to think about building a consulting chatbot for those with difficulty talking to human psychologists but suffer from psychological illness.

necessity

1 Psychological problem of Chinese people is becoming more and more prominent.

2 China's psychological counseling industry is immature, the demand for professional population consultants is great, but the quality of psychologists varies.

3 traditional consulting is expensive.

Aims

We aim to develop an intelligent chatbot that relieves psychological stress on users

and guides patients with lighter psychological problems. Those who have apprehension about talking with human beings make it easier for them to share thoughts with a robot.

Optional Aims

We are trying to build a simple recommended system to recommend interested Psychology Articles.

Doing a Psychological Scale Evaluation and Analysis as prior knowledge for the chatbot.

Objectives

Trying different NLP models like transformer\ berts to train a chatbot.

Project Descriptions:

We are planning to build a chat site for this project, and we planned to use Flask and vue for the fore-end and back-end. Like woebot https://woebothealth.com/ but a Chinese and English version. And we decide to create a cartoon character to ease the patient during the conversation.

As for the training dataset, we would combine two language versions of it.

Dataset:

Chinese:

https://www.kaggle.com/samurais/emotional-first-aid-dataset

https://github.com/chatopera/efaqa-corpus-zh

https://www.flyai.com/d/319

https://tianchi.aliyun.com/dataset/dataDetail?dataId=90202

English：

https://arxiv.org/pdf/1909.02809.pdf

https://github.com/srbhklkrn/depression-therapist-chatbot

https://www.kaggle.com/narendrageek/mental-health-faq-for-chatbot

https://www.kaggle.com/arashnic/the-depression-dataset

https://www.kaggle.com/nikhileswarkomati/suicide-watch

Three possible functions included in our chatbot are as below:

1. Respond to patient's sharing, like encourage, discourage, emphasize,
2. Give some professional advice.
3. React to the emergent situation when a patient loses control of emotion, like extreme anger, excessive sadness.

Optional goal:

We would establish a whole psychology website like this https://v6.modao.cc/app/5649e559f137c208919b2e51616717301be019af?simulator_type=device&sticky, which involves many psychology tests, articles.

Dataset like:

https://tianchi.aliyun.com/dataset/dataDetail?dataId=93433

https://www.kaggle.com/lucasgreenwell/depression-anxiety-stress-scales-responses

https://www.kaggle.com/lucasgreenwell/datasets

Target potential patients and doctors.

For interfacing, we will establish a pre-assessment website, in which there are several psychological questions to be answered. The answers will be stored in the form of JSON and would send to the server to evaluate the initial situation of patients.

Ⅱ System Functionalities Mapping

Related Course	Mapped System Functionalities
Machine Reasoning	1. The questionnaire uses expert domain knowledge to classify what type a question belongs to. Based on the score, the user can know what potential mental illness he/she has. 2. MySQL to store our knowledge data, which related to S-MR Day1 "Machine Memory & Query: Database to store knowledge data"
Reasoning Systems	1. content-based recommendation: Using chatbot and NLP mental health model, we can classify the user's message to different mental health labels and recommend them to check the issue on wikiHow 2. for training the NLP model we first embedding the text feature and try different methods like SVM\ DL\ transformer to do the classification

	task.
Cognitive Systems	1. Keywords Extraction: TF-IDF to extract the article label, which related to Day 2 "NATURAL LANGUAGE COMPREHENSION AND PROCESSING" -tf-idf Indexing 2. Word Embedding to reduce the dimension of the article label word vector, which related to Day 2 "NATURAL LANGUAGE COMPREHENSION AND PROCESSING" -Other Vectorization Methods - Word Embeddings 3. Cosine similarity to compare the result of the user answering the questionnaire for the recommended article, which related to Day 2 "NATURAL LANGUAGE COMPREHENSION AND PROCESSING" -Similarity-Based Intent Identification - Cosine Similarity

Ⅲ Database Design Document

1 Introduction:

1.1 Writing Purpose:

This document is prepared so that the project directors, business analysts, project developers, database managers, and future system maintenance personnel participating in the project can understand the database design idea, overall database architecture, and various detailed information of the system, and for future projects to participate in and learn from the experience of the project.

1.2 Scope:

The database project mainly includes two parts: questionnaire and article.

1.3 Definition:

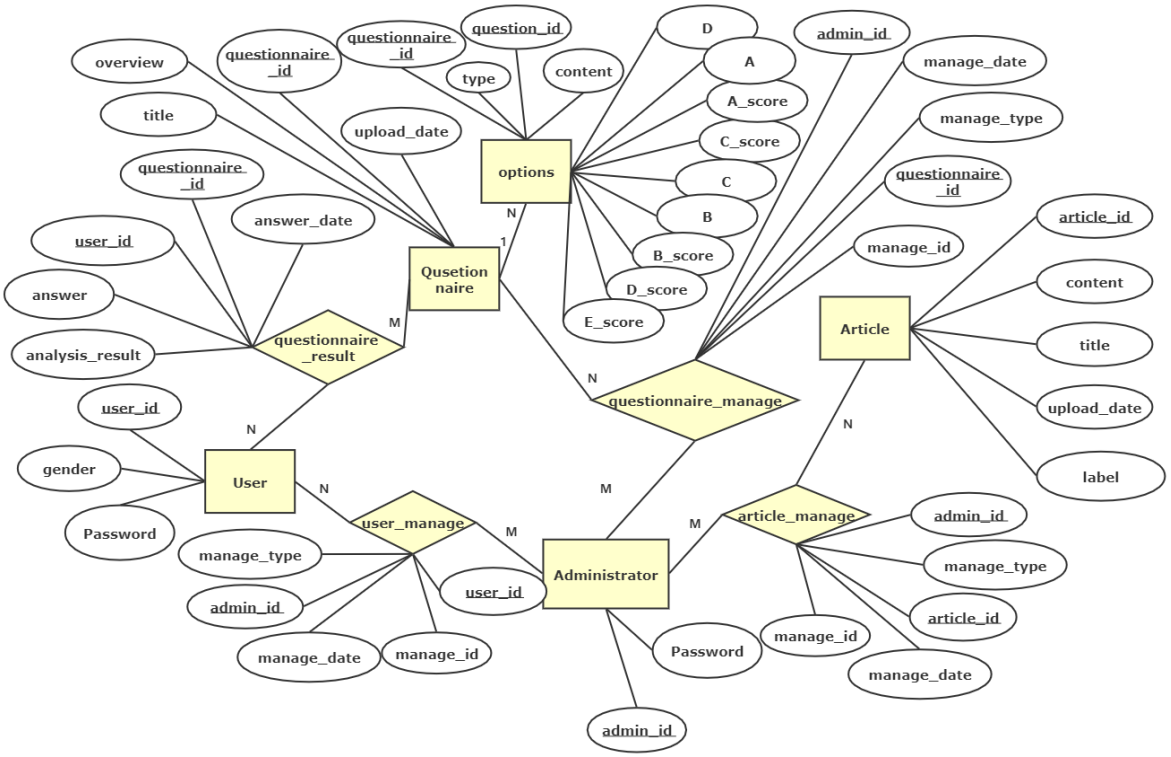
Analysis result: The result was analyzed based on the ,Foreignuser's answers to the questionnaire
Manage type: Operation types of insert, delete, select and update

2 Database Environment:

Database System: MySQL 8.0.27

Database Management Software: Navicate Premium 15
Operating System: Windows 10
Network Protocol: TCP/IP

3 Logical Structure Design:



3.1 Entities:

User:

User_id: User account
Gender: User gender
Password: User password

Administrator:

Admin_id: Administrator account
Password: Administrator account

Article:

Article_id: Article identification number
Content: Article content
Title: Article title
Upload_date: Date of uploading article
Label: Article classification label

Questionnaire:

Questionnaire id: ID number of questionnaire
Title: Questionnaire title

Overview: Abstract of questionnaire
Upload_date: Date of uploading questionnaire

Options:
Questionnaire id: ID number of questionnaire
Question_id: ID number of question
Content: Question content
A-E: Option content
A_Score-E_score: Score of option
Type: Question classification type

3.2 Relations:

User_manage: Administrator's management of users
User_id: User account
Admin_id: Administrator account
Manage_type: Operation type
Manage_date: Operation date
Manage_id: ID number or this operation

Article_manage: Administrator's management of articles
Article_id: Article identification number
Admin_id: Administrator account
Manage_type: Operation type
Manage_date: Operation date
Manage_id: ID number of this operation

Questionnaire _manage: Administrator's management of questionnaires
Questionnaire id: ID number of questionnaire
Admin_id: Administrator account
Manage_type: Operation type
Manage_date: Operation date
Manage_id: ID number of this operation

Questionnaire _result: Results of the user's answer to the questionnaire
Questionnaire_id: ID number of questionnaire
User_id: User account
Answer_date: Date of filling questionnaire
Answer: Answers to the questions
Analysis_result: analysis result based on the answers

4 Physical Structure Design:

In this section we shall summarize the database objects, such as table, view, and process.

ID	Object Name	Object Type	Description
1	*T _User*	Entity	User information
2	*T_ Administrator*	Entity	Administrator information
3	*T_ Article*	Entity	Article information
4	*T_ Questionnaire*	Entity	Questionnaire information
5	*T_Options*	Entity	Question information
6	*T_ User_manage*	Relation	Management of user
7	*T_ Questionnaire _manage*	Relation	Management of questionnaire
8	*T_ Questionnaire _result*	Relation	Result of questionnaire
9	*T_ Article_manage*	Relation	Management of articles

4.1 Tables:

T_User:

Name	Type	Is Not Null	Is Primary Key	Is Foreign Key	Remark

User_id	CHAR(8)	Yes	Yes		Eight characters of naming: last two digits of the year of registration, two digits of the month of registration, and four digits of the id number
Password	VARCHAR	Yes			
Gender	BINARY(1)				

T_ Administrator:

Name	Type	Is Not Null	Is Primary Key	Is Foreign Key	Remark
Admin_id	CHAR(8)	Yes	Yes		Zero is filled before numbering from 1, eight digits in total
Password	VARCHAR	Yes			

T_ Article:

Name	Type	Is Not Null	Is Primary Key	Is Foreign Key	Remark
Article_id	CHAR(10)	Yes	Yes		Ten digits in total, including the last two digits of the year, two digits of the month, two digits of the source id, and four digits of id number

Title	VARCHAR	Yes			
Upload _date	DATE	Yes			
Label	TEXT				
Content	TEXT				

T_ Questionnaire:

Name	Type	Is Not Null	Is Primary Key	Is Foreign Key	Remark
Questionnaire_id	CHAR(10)	Yes	Yes		Ten digits in total, including the last two digits of the uploaded year, two digits of the month, two digits of the source id, and four digits of the id number
Title	VARCHAR	Yes			
Overview	TEXT				
Upload_date	DATE				

T_Options:

Name	Type	Is Not Null	Is Primary Key	Is Foreign Key	Remark
Questionnaire_id	CHAR(10)	Yes	Yes		Same as before
Question_id	CHAR(3)	Yes	Yes		Start from 1
Content	TEXT	Yes			
A-E	VARCHAR				
A_Score-E_score	INT				
Type	VARCHAR				

T_ User_manage:

Name	Type	Is Not Null	Is Primary Key	Is Foreign Key	Remark
User_id	CHAR(8)	Yes	Yes		Same as before
Admin_id	CHAR(8)	Yes	Yes		Same from before
Manage_id	INT	Yes	Yes		Increment by 1 from zero

Manage_type	INT(1)	Yes			[0-3]: respectively indicates insertion, deletion, selection, and update
Manage_date	DATE	Yes			

T_ Questionnaire _result:

Name	Type	Is Not Null	Is Primary Key	Is Foreign Key	Remark
Questionnaire_id	CHAR(10)	Yes	Yes		Same as before
User_id	CHAR(8)	Yes	Yes		Same as before
Answer_date	DATE	Yes			
Answer	TEXT	Yes			
Analysis_result	TEXT				

T_ Article_manage:

Name	Type	Is Not Null	Is Primary Key	Is Foreign Key	Remark
Article_id	CHAR(10)	Yes	Yes		Same as before
Admin_id	CHAR(8)	Yes	Yes		Same as before

Manage_id	INT	Yes	Yes		Increment by 1 from zero
Manage_type	INT(1)	Yes			[0-3]: respectively indicates insertion, deletion, selection, and update
Manage_date	DATE	Yes			

5 Safety Design:

5.1 Configuration of Database Roles and Permissions

User: answer the questionnaire | modify their passwords
Administrator: manage questionnaires | manage articles | manage users | modify their passwords

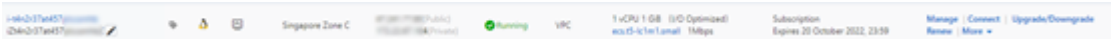
Ⅳ Installation and User Guide

1 Installation

1.1 Imental - Chatbot

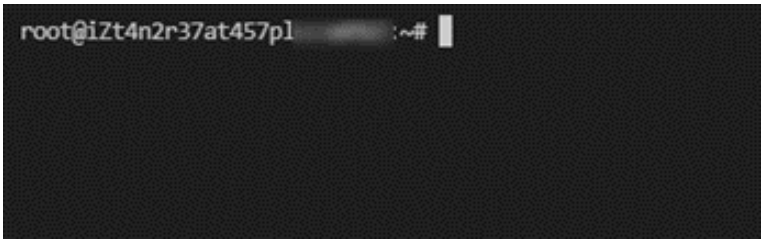
1.1.1 Cloud Server Establish

1) Apply for a cloud server on any platform like [Alibaba Cloud] https://account.alibabacloud.com/
2) Choosing system as ubuntu 20.04 64bit:



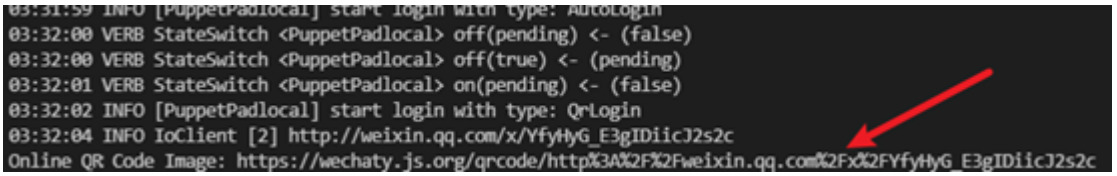
3) (optional) Apply for a domain name as you like
4) Adding security rule to allow the port(e.g. 8080/8080 0.0.0.0/0)

5) Connect with VSCode (plug-in: remote SSH) and log in with your name and password



1.1.2 Wechaty Establish

1) Apply for a 7-day free token from http://pad-local.com/
   if you want more time please check [Wechaty]https://wechaty.js.org/
2) Establish Wechaty in the cloud server with docker using the following commands:
   apt update
   apt install docker.io #establish docker
   docker pull wechaty/wechaty:0.65 #establish wechaty
   export WECHATY_LOG="verbose"
   export WECHATY_PUPPET="wechaty-puppet-padlocal"
   export WECHATY_PUPPET_SERVER_PORT="xxxx" # your port
   export WECHATY_TOKEN="puppet_padlocal_xxx" # your token
   export WECHATY_PUPPET_PADLOCAL_TOKEN="xxx " #your token
   docker run -ti --name wechaty_puppet_service_token_gateway --rm -e WECHATY_LOG -e WECHATY_PUPPET -e WECHATY_TOKEN -e WECHATY_PUPPET_SERVER_PORT -e WECHATY_PUPPET_PADLOCAL_TOKEN -p "$WECHATY_PUPPET_SERVER_PORT:$WECHATY_PUPPET_SERVER_PORT" wechaty/wechaty:0.65
3) Check if the link is successful by using:
   https://api.chatie.io/v0/hosties/puppet_padlocal_xxx #add your own token
   If the website shows {"ip":"0.0.0.0","port":0} there is something wrong with the above command. Please check again.
   If it shows {"ip":"#your cloud server ip","port":#your set port}, then it is successful
4) Log in with your **WeChat/WhatsApp** (if you are using the WhatsApp, you should change the **PUPPET** and command https://wechaty.js.org/)
   P.S. The account you log in is the robot



1.1.3 Download our Model and Code

1) the models of module and medical Q&A module should be downloaded from link：
   https://pan.baidu.com/s/182BVn_ohEpMM_k_aBFMGqg
   code：n5m6
2) git clone our project and find local_demo folder, edit the model path in main_domin.py

```
params_path = './model_state.pdparams'
```

```
module.export(params_path=r'./medical_cn_qa.params', module_name="ernie_gen_medical", author="vemodalen")
```

3) run main_domin.py

4) Besides without installing it on your own environment, we highly recommended you to try the Baidu AI studio to check our demo https://aistudio.baidu.com/aistudio/projectdetail/2510995

1.2 Imental - WordPress

1.2.1 Establish

Establish it using *docker-compose.yml* ([Wordpress] https://docs.docker.com/samples/wordpress/):

```yaml
version: "3.3"



services:

  DB:

    image: mysql:5.7

    volumes:

      - db_data:/var/lib/mysql

    restart: always

    environment:

      MYSQL_ROOT_PASSWORD: somewordpress

      MYSQL_DATABASE: wordpress

      MYSQL_USER: wordpress

      MYSQL_PASSWORD: wordpress



  WordPress:

    depends_on:

      - db

    image: wordpress:latest

    volumes:

      - wordpress_data:/var/www/html

    ports:

      - "8000:80"

    restart: always

    environment:

      WORDPRESS_DB_HOST: db:3306
```

```
    WORDPRESS_DB_USER: wordpress

    WORDPRESS_DB_PASSWORD: wordpress

    WORDPRESS_DB_NAME: wordpress

volumes:

 db_data: {}

 wordpress_data: {}
```

1.2.2 Build the Project

Now, run **docker-compose up -d** from your project directory.
This runs docker-compose up in detached mode, pulls the needed Docker images, and starts the WordPress and database containers, as shown in the example below.
The command docker-compose down removes the containers and default network but preserves your WordPress database.
The command **docker-compose down --volumes** remove the containers, default network, and the WordPress database.

1.2.3 Enjoy with WordPress

Just copy and visit our websites:
https://www.wpbeginner.com/wp-tutorials/how-to-move-wordpress-from-local-server-to-live-site/#manualmigration
https://www.wpbeginner.com/wp-tutorials/how-to-move-wordpress-from-local-server-to-live-site/#duplicator

1.3 Imental -- Web Page

1.3.1 Load Database

1) Open Command Prompt and change directory to project folder. Use command:
   mysqldump -u root -p imental < imental v1.1.txt
   to load schema to your MySQL server.
2) Open python file setting.py change SQL server connection information to your own
   mysql+pymysql://root:root@localhost:3306/imental

1.3.2 Environment Configuration

In Terminal, use the command:
pip install -r requirements.txt
to install environment requirements.

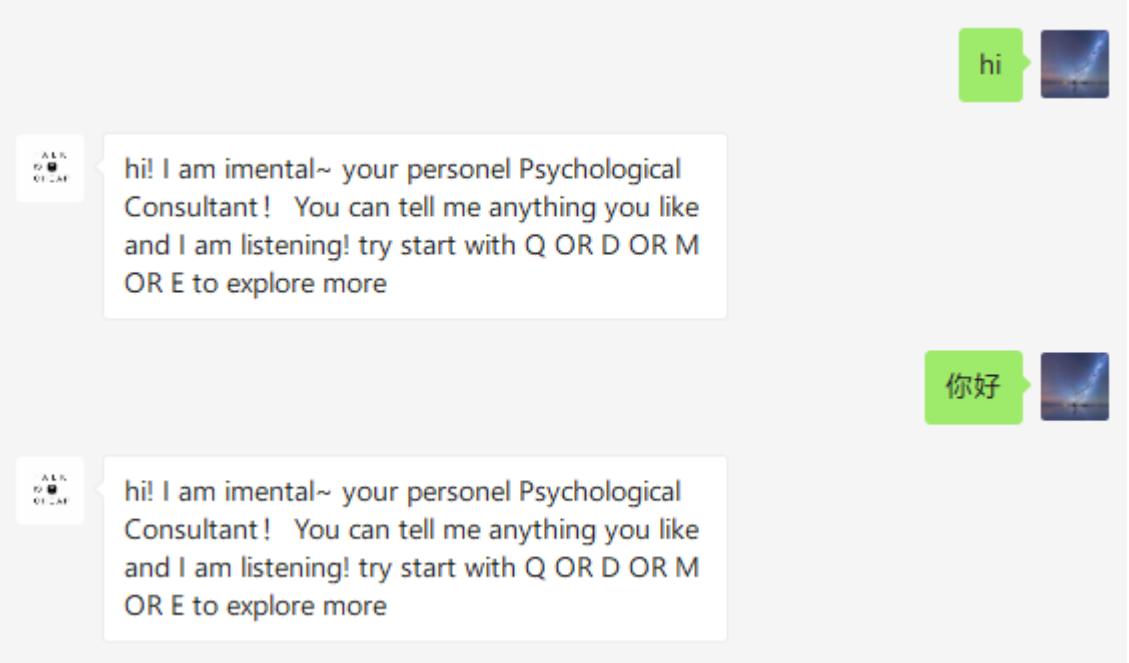
1.3.3 Start Exploring

Run python file app.py to start the system. Go to
http://127.0.0.1:5000/
in your browser to view the webpage.

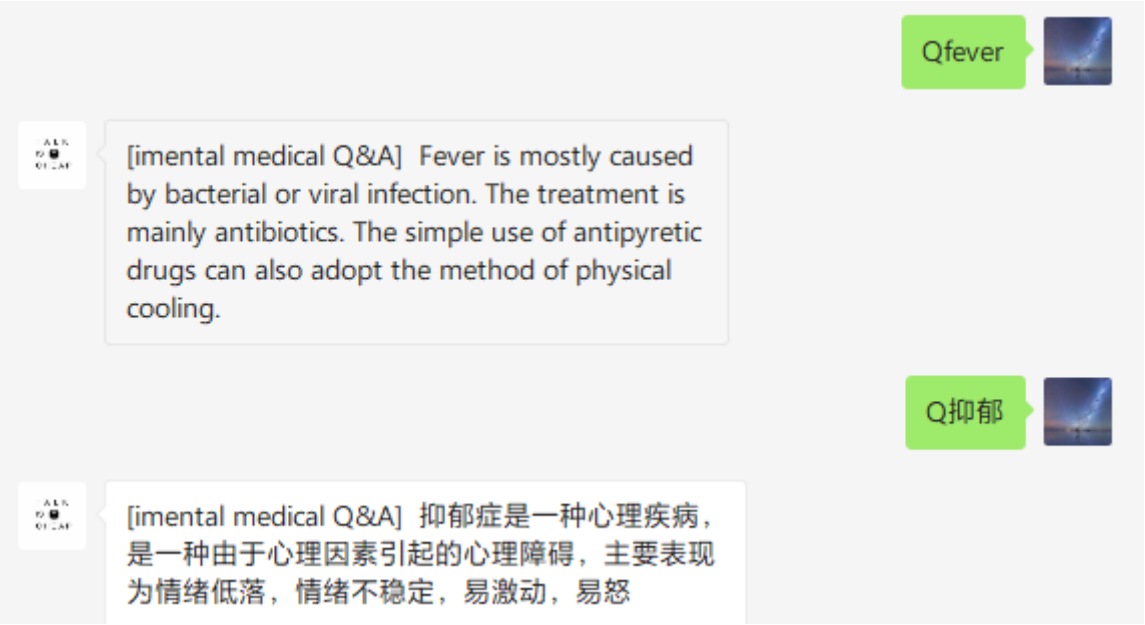
2 User Guide

2.1 Imental -- Chatbot

1. open your wechaty server and DL server
2. login with your WeChat account
3. add imental as WeChat friend with QR code on the website
4. type in the chat
    1) say hi or 你好

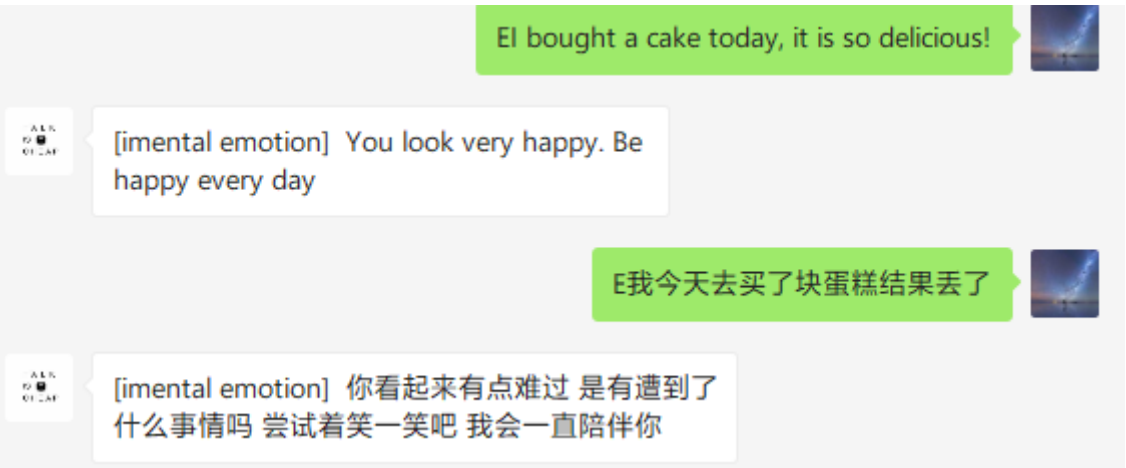


    2) start with Q



    3) start with D

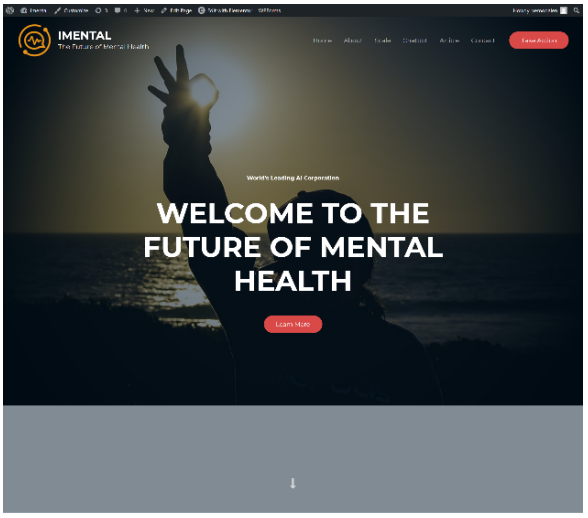
4) start with E



5) start with M

2.2 Imental -- Wordpress

1. open your server
2. open with your ip or domin name
3. select different button above
    1) Home



About Us

25 Long Years Of Psychology Excellence With Quality At It's Best!

Learn More

Our Products

We are the AI Psychology heads and produce the most reliable and trendy solution you are looking for.

Imental Chatbot

Intelligent Evaluation of Psychological Scales

Mental Health Recommend System

The only place where you'll get the AI Psychology solution for all your mental needs.

Our Contributions

Mental We Care!

Depressed

Helpless

SAD

Need Help with Personel Mental Health Support? We Are Experts! Learn More

Products

Imental Chatbot
Psychological Scales
Mental Health Article

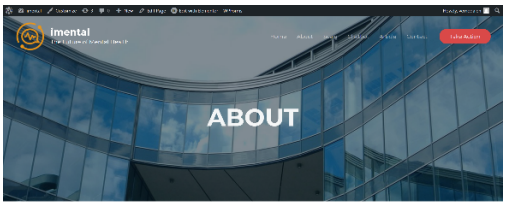
Features

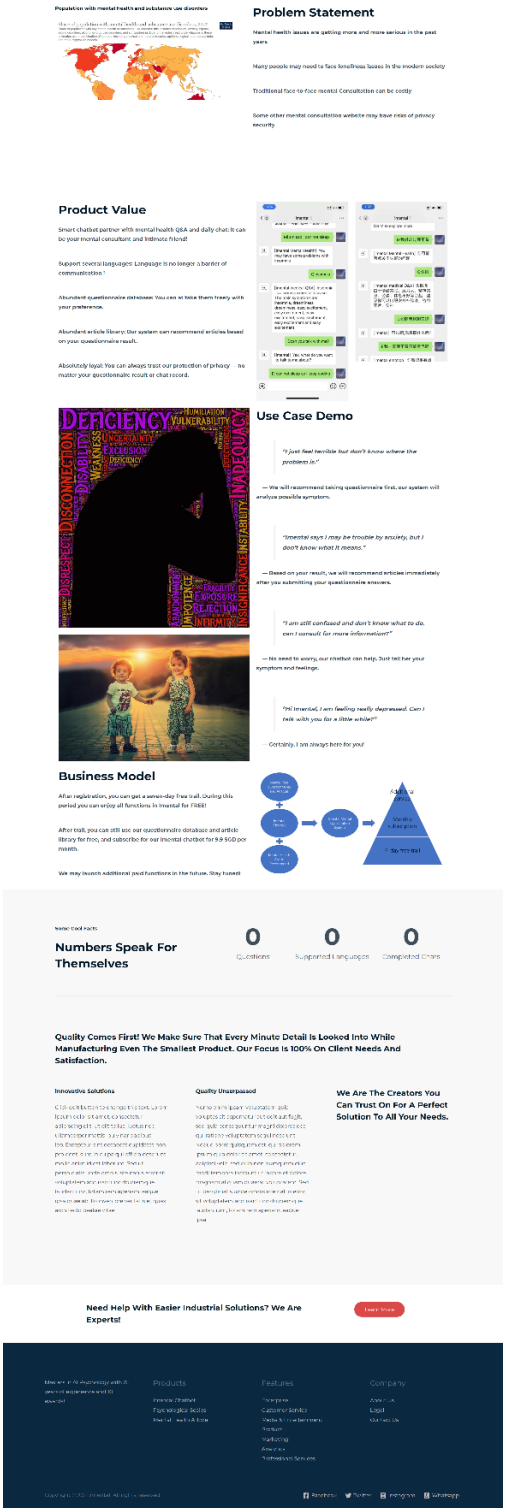
Enterprise
Customer Service
Media & Entertainment
Product
Marketing
Analytics
Professional Services

Company

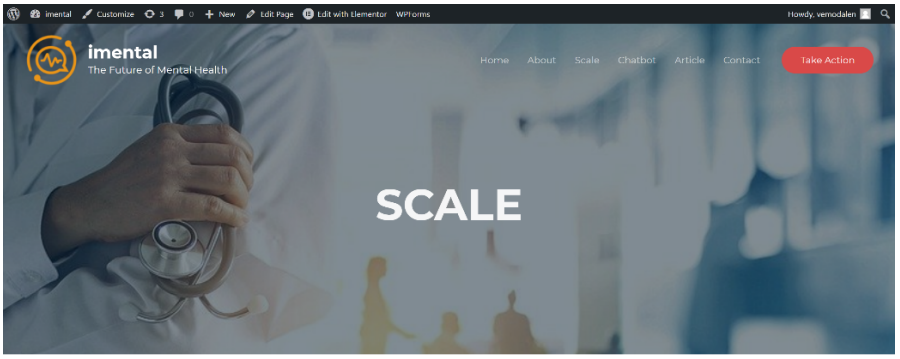
About Us
Legal
Contact Us

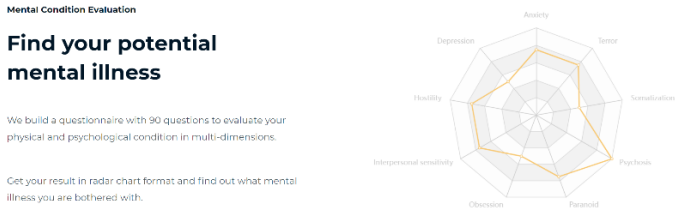
2) About

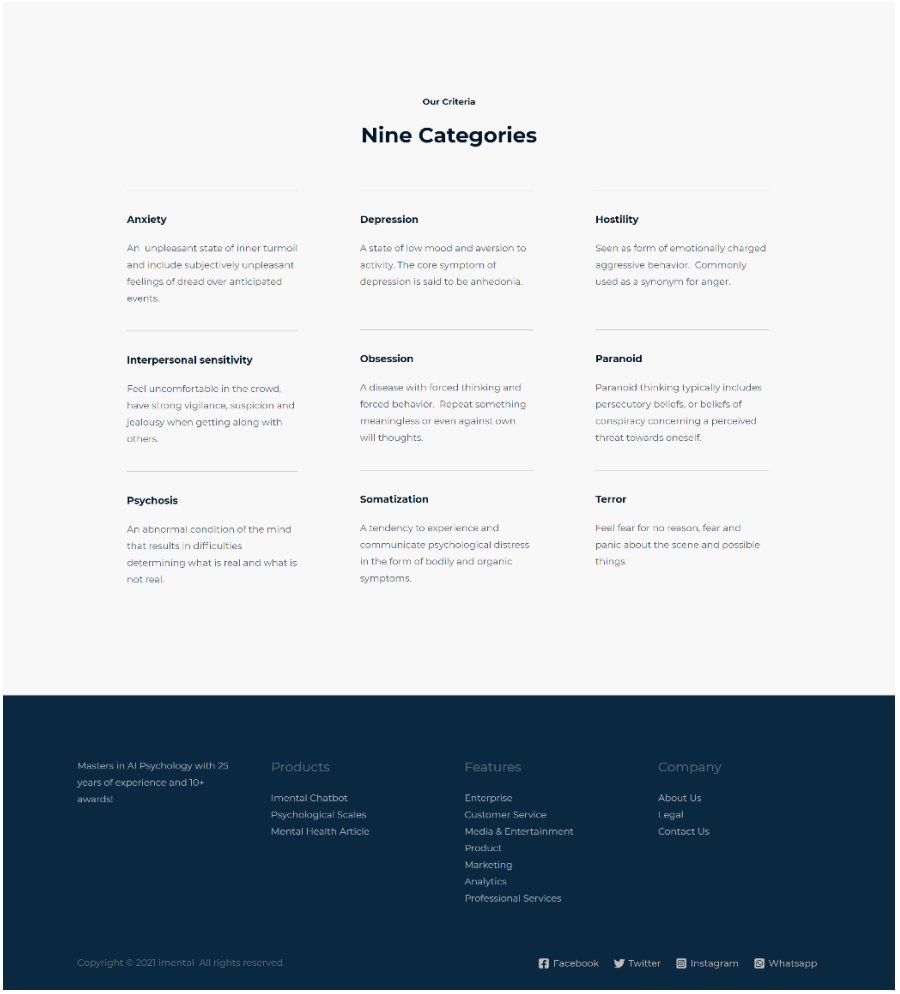




3) Scale

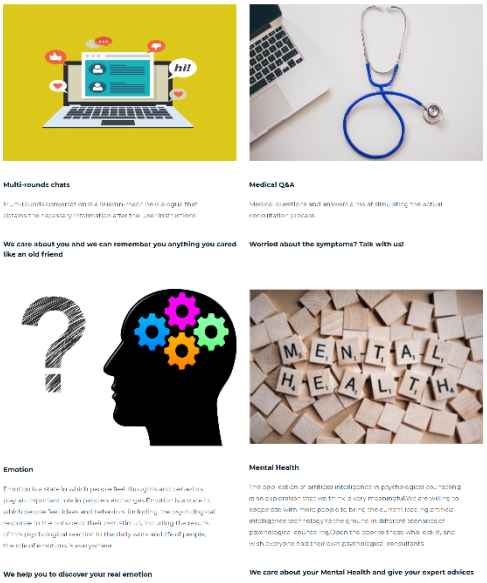

imental
Customize
New
Edit Page
Edit with Elementor
WPForms
Howdy, vemodalen
imental
The Future of Mental Health
Home
About
Scale
Chatbot
Article
Contact
Take Action
SCALE

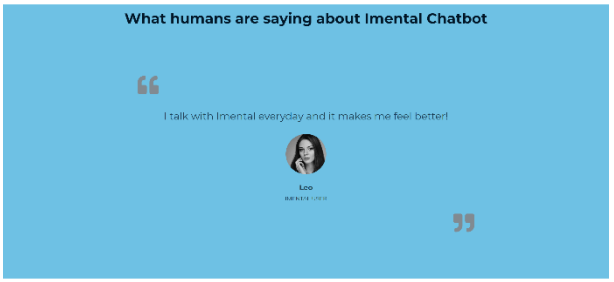

Mental Condition Evaluation
Find your potential mental illness
We build a questionnaire with 90 questions to evaluate your physical and psychological condition in multi-dimensions.
Get your result in radar chart format and find out what mental illness you are bothered with.
Anxiety
Terror
Somatization
Psychosis
Paranoid
Obsession
Interpersonal sensitivity
Hostility
Depression

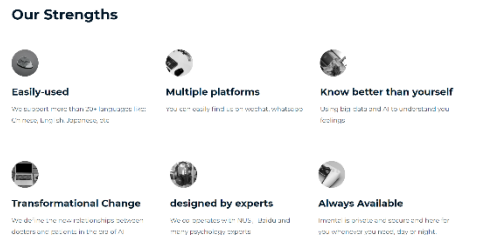

Our Criteria
Nine Categories
Anxiety
An unpleasant state of inner turmoil and include subjectively unpleasant feelings of dread over anticipated events.
Depression
A state of low mood and aversion to activity. The core symptom of depression is said to be anhedonia.
Hostility
Seen as form of emotionally charged aggressive behavior. Commonly used as a synonym for anger.
Interpersonal sensitivity
Feel uncomfortable in the crowd, have strong vigilance, suspicion and jealousy when getting along with others.
Obsession
A disease with forced thinking and forced behavior. Repeat something meaningless or even against own will thoughts.
Paranoid
Paranoid thinking typically includes persecutory beliefs, or beliefs of conspiracy concerning a perceived threat towards oneself.
Psychosis
An abnormal condition of the mind that results in difficulties determining what is real and what is not real.
Somatization
A tendency to experience and communicate psychological distress in the form of bodily and organic symptoms.
Terror
Feel fear for no reason, fear and panic about the scene and possible things
Masters in AI Psychology with 25 years of experience and 10+ awards!
Products
Imontal Chatbot
Psychological Scales
Mental Health Article
Features
Enterprise
Customer Service
Media & Entertainment
Product
Marketing
Analytics
Professional Services
Company
About Us
Legal
Contact Us
Copyright © 2021 imental. All rights reserved.
Facebook
Twitter
Instagram
Whatsapp

4) Chatbot

Modules



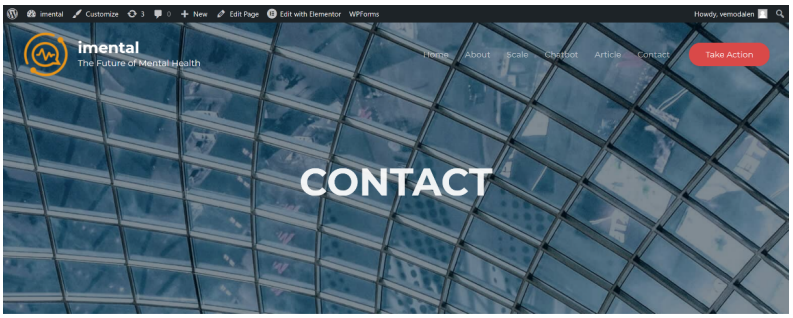


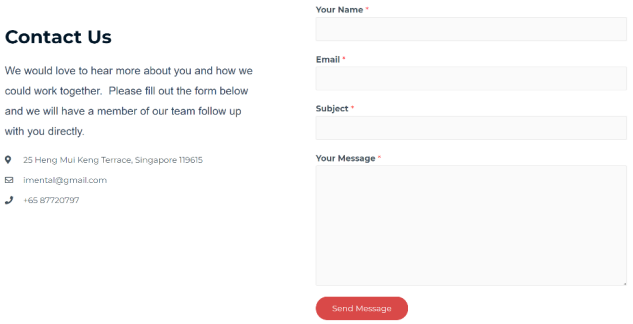


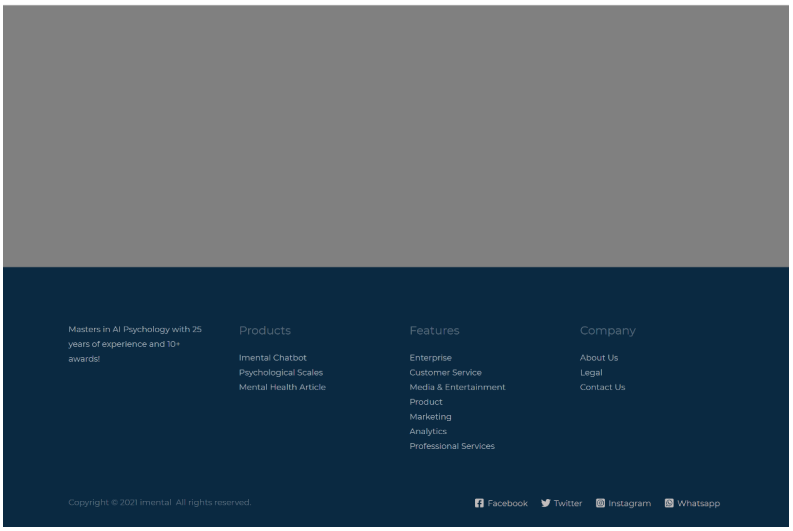
5) Article

imental Customize 3 0 New Edit Page Edit with Elementor WPForms
Howdy, vemodalen
Home About Scale Chatbot Article Contact
Take Action
ARTICLE RECOMMEND
Keyword extraction based on TF-IDF
We use the TF-IDF algorithm to extract the keywords of the article based on the psychology professional tutorial article, add it to the article database, and use it as the article tag
Article Recommendation based on Word-Vector-Similarity
Then we search for articles based on the tag similarity of the article database according to the user questionnaire result tags, and recommend articles with high similarity.
Begin
Article_DB
Questionaire _result
RESULT: Problem tendency based on questionnaire analysis [Anxiety .etc]
Article
ALL_article_label
result label
TF-IDF Keywords extraction
Word embedding
Calculate cosine distance similarity
Extracted Keywords
Recommend articles based on similarity
END
Masters in AI Psychology with 25 years of experience and 10+ awards!
Products
Imental Chatbot
Psychological Scales
Mental Health Article
Features
Enterprise
Customer Service
Media & Entertainment
Product
Marketing
Analytics
Professional Services
Company
About Us
Legal
Contact Us
Copyright © 2021 imental All rights reserved.
Facebook Twitter Instagram Whatsapp

6) Contact

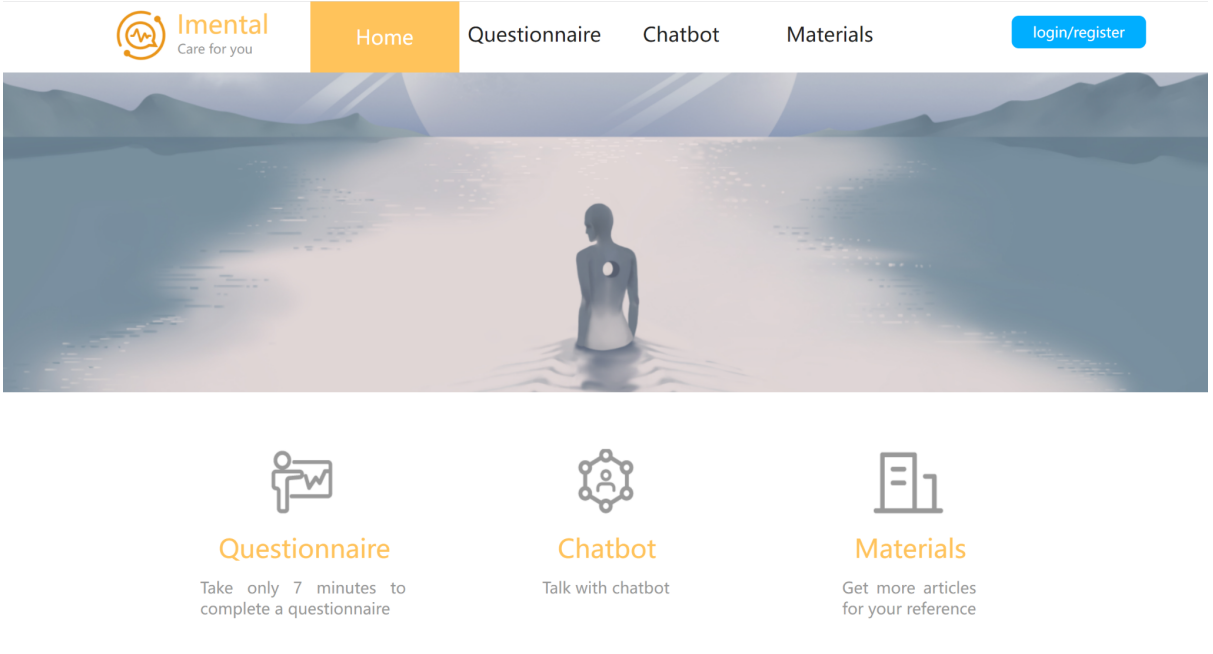




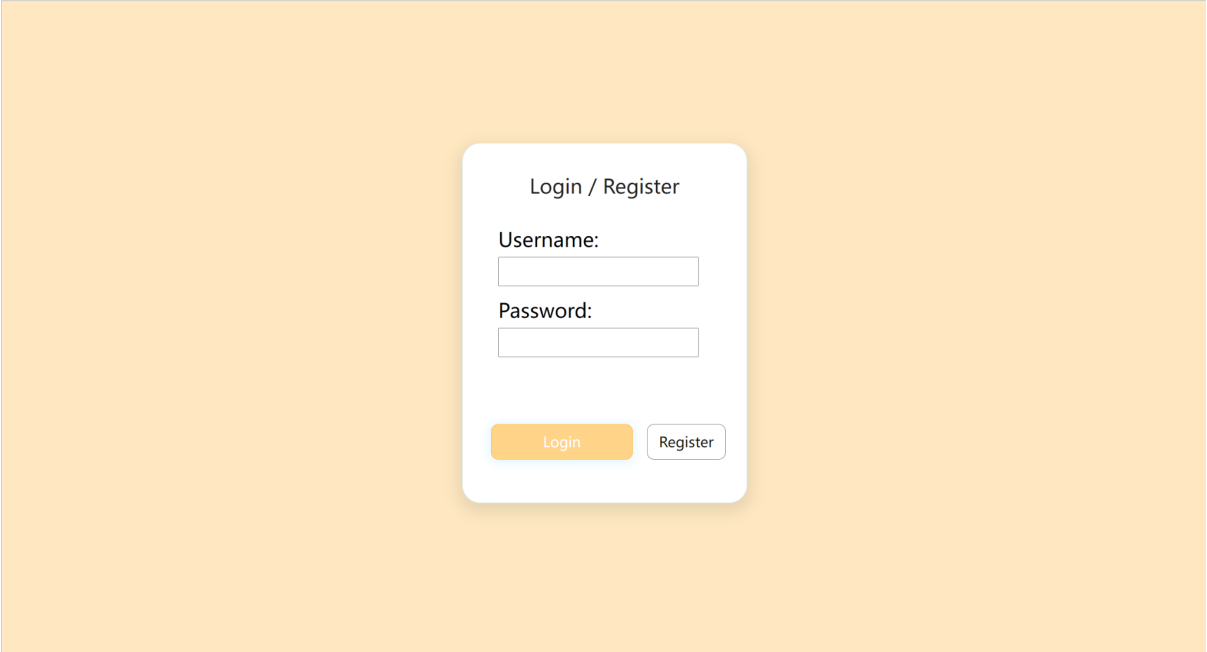


2.3 Imental -- Web Page

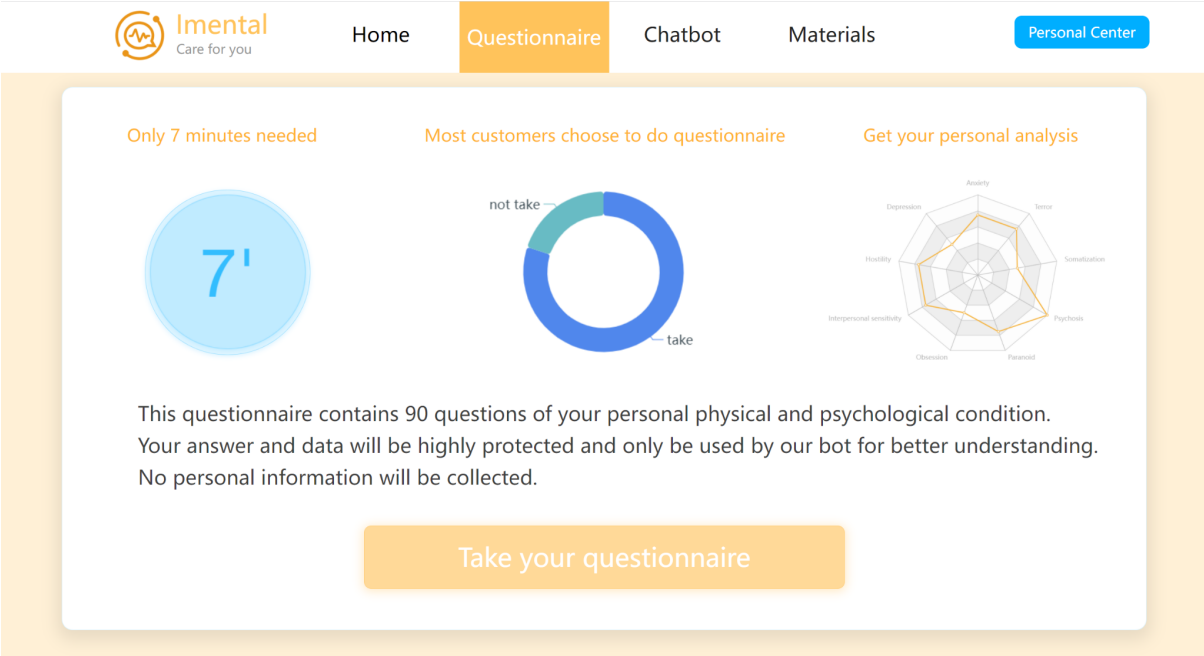
1) Enter http://127.0.0.1:5000/ in your browser, and you will see the home page of our web system.



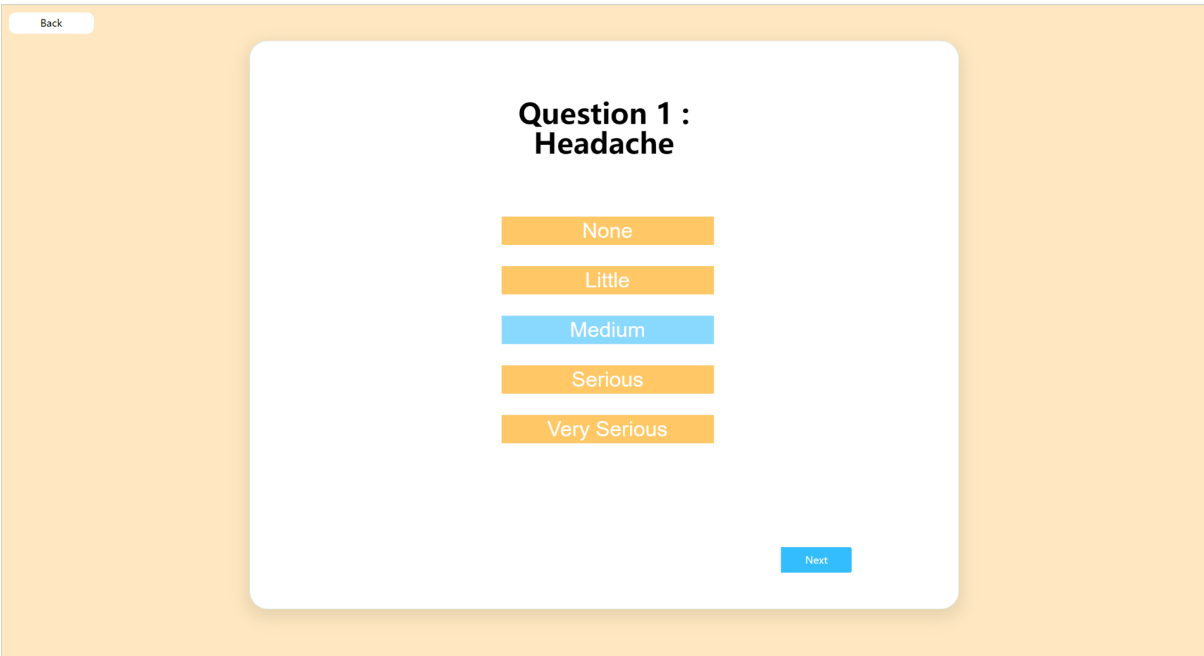
2) Before starting your exploration, you need to log in. If you do not have an account yet, you can click the Register button to register a new account.



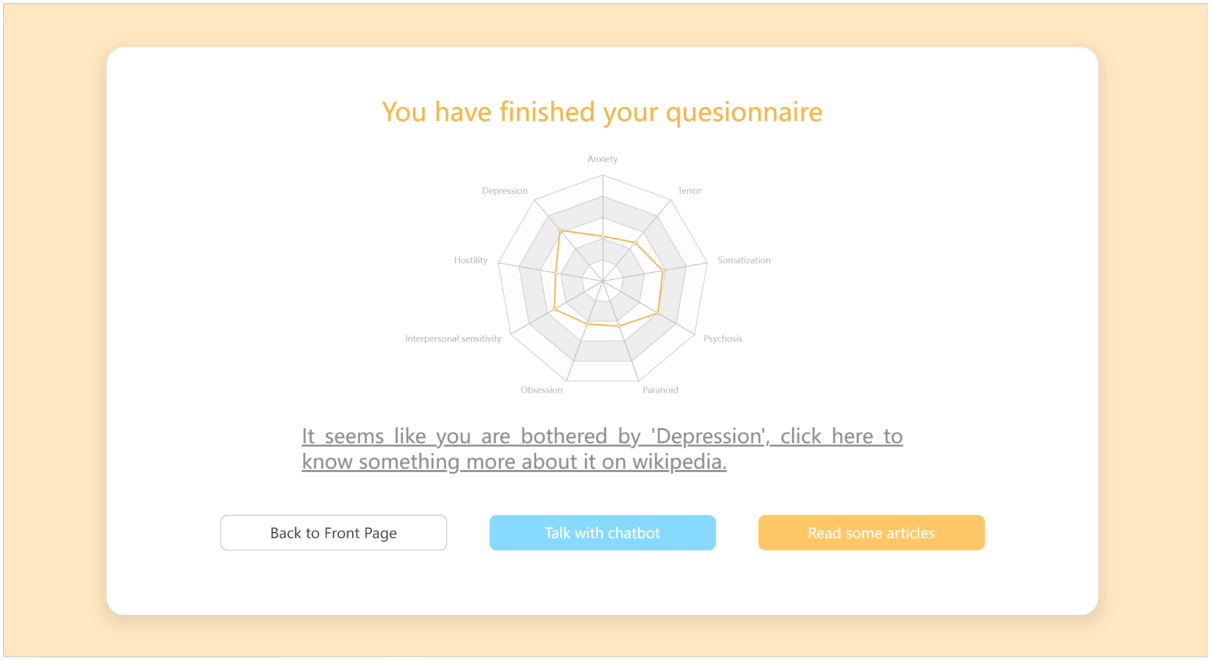
3) We suggest you take the questionnaire first, which will be helpful for you to know your potential mental illness. Click the questionnaire button, and you will see the basic information of the questionnaire.



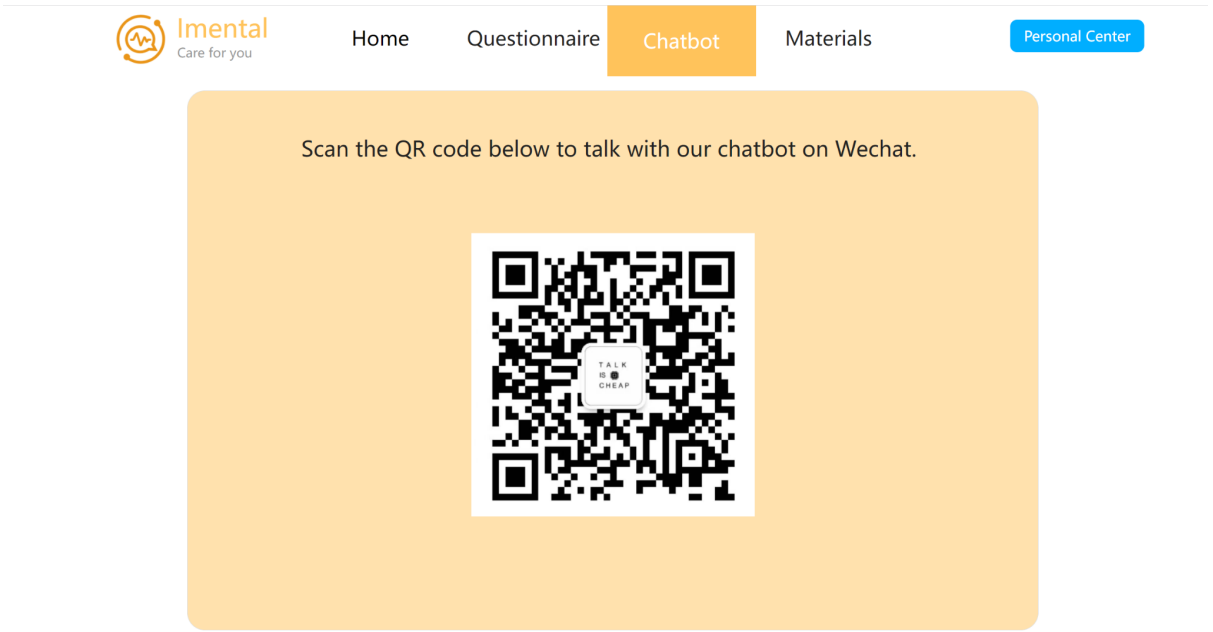
4) After clicking the start button, you will start to answer questions. You can choose one option from ‘None’, ‘Little’, ‘Medium’, ‘Serious’ and ‘Very Serious’.



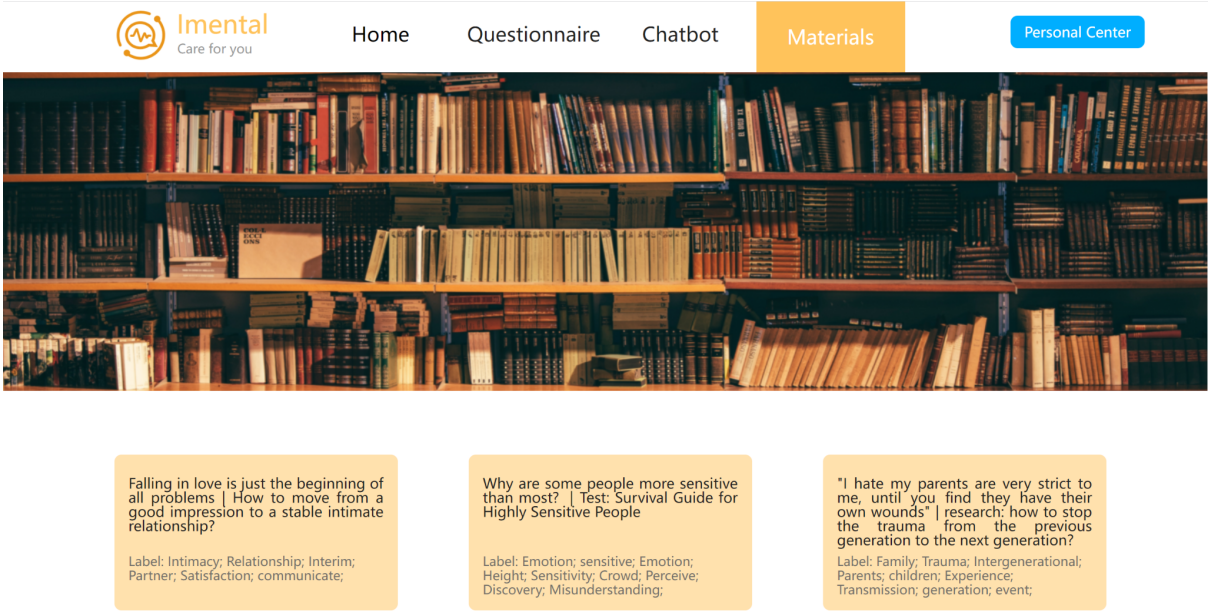
5) Once you finish answering and submit your result, you will get a radar chart that indicates your scores in each category. And for the one you get the highest score, you can click the link to know more about it on Wikipedia.



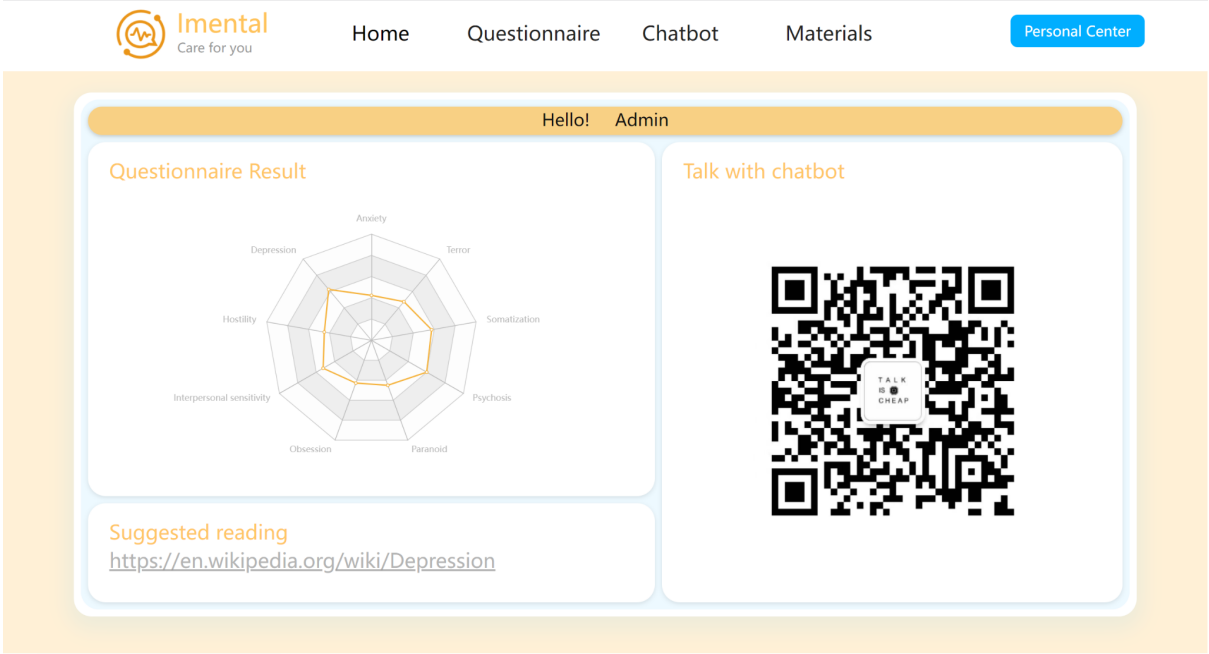
6) You can click the Chatbot button and scan the QR code to start talking with our chatbot.



7) You can click the Material button and choose to start reading some articles we offer...



8) In your personal center, you can view your questionnaire result and suggest reading, or the Chatbot QR code at any time.



Ⅴ Implementation in Tools

1 Imental -- Chatbot

1.1 paddlepaddle

PaddlePaddle (PArallel Distributed Deep LEarning) is a simple, efficient, and extensible deep learning framework. And PaddlePaddle, as the only independent R&D deep learning platform in China, has been officially open-sourced to professional communities since 2016. It is an industrial platform with advanced technologies and rich features that cover core deep learning frameworks, basic model libraries, end-to-end development kits, tools & components as well as service platforms. PaddlePaddle is originated from industrial practices with dedication and commitments to industrialization. It has been widely adopted by a wide range of sectors including manufacturing, agriculture, enterprise service, and so on while serving more than 2.3 million developers. With such advantages, PaddlePaddle has helped an increasing number of partners commercialize AI.

1.2 paddlenlp

PaddleNLP is a powerful NLP library with Awesome pre-trained Transformer models and an easy-to-use interface, supporting wide range of NLP tasks from research to industrial applications.

- Easy-to-Use API
  - The API is fully integrated with PaddlePaddle 2.0 high-level API system. It minimizes the number of user actions required for common use cases like data loading, text pre-processing, awesome transformer models, and fast inference, which enables developers to deal with text problems more productively.
- Wide-range NLP Task Support
  - PaddleNLP support NLP task from research to industrial applications, including Lexical Analysis, Text Classification, Text Matching, Text Generation, Information Extraction, Machine Translation, General Dialogue, and Question Answering, etc.
- High Performance Distributed Training
  - We provide an industrial level training pipeline for super large-scale Transformer model based on Auto Mixed Precision and Fleet distributed training API by PaddlePaddle, which can support customized model pre-training efficiently

1.3 paddlehub

Paddlehub has an awesome pre-trained models toolkit based on PaddlePaddle.(300+ models including Image, Text, Audio, and Video with Easy Inference & Serving deployment)

1.4 wechaty

Wechaty is an RPA (Robotic Process Automation) SDK for Chatbot Makers which can help you create a bot in 6 lines of JavaScript, Python, Go, and Java, with cross-platform support including Linux, Windows, macOS, and Docker.

2 Imental -- Questionnaire

2.1 Flask

Flask is a micro web framework written in Python. It is classified as a microframework because it does not require particular tools or libraries. It has no database abstraction layer, form validation, or any other components where pre-existing third-party libraries provide common functions. However, Flask supports extensions that can add application features as if they were implemented in Flask itself. Extensions exist for object-relational mappers, form validation, upload handling, various open authentication technologies,a more accurate diagnosis,, and several common framework-related tools.

2.2 Echarts

An open-source visualization library implemented by JavaScript can run smoothly on PCs and mobile devices and is compatible with most current browsers (IE9 / 10 / 11, chrome, Firefox, Safari, etc.). The bottom layer relies on the vector graphics library zrender to provide intuitive, interactive, and highly personalized data visualization charts.

Ⅵ Individual Reports

Wu Junxian -- A0231293L

Personal Contribution:

-- Chatbot design and development
deploy the wechaty framework on ALibaba Cloud Server to receive the users' messages and send the messages from chatbot to users
-- NLP model(multi-rounds chat, emotion Binary classification, mental health classification, Medical Q&A)

multi-rounds chat: using pre-trained baidu unifiedtransformer model(dataset:https://aistudio.baidu.com/aistudio/competition/detail/48/0/task-definition)

emotion Binary classification:using pre-trained baidu TaskFlow model(dataset:baidu private dataset)

mental health classification: extract the feature and try different methods to train the model like SVM,BERT,SKEP,PLATO and select the best one which is skep model(dataset:https://github.com/chatopera/efaqa-corpus-zh)

Medical Q&A: train and finetune with ernie-gen model and select the best ppl(dataset:https://github.com/zhangsheng93/cMedQA2)

-- software prototype design

design the software logic and interface on Modao

-- Front End Web Development(WordPress)

Page chatbot, connect us, home

-- System Design

as team leader, planning the whole development schedule and system structure

-- Video

record the business video

record the tech video of chatbot part

– Report

chatbot related tech part

Learning Outcome:

Leadership skills: I am the project lead and therefore I was heavily involved from the start to the end. After we chose this AI psychological topic, I helped and led the team to brainstorm for features and make a software prototype first. And I help to plan and coordinate weekly process meetings by worktile to ensure our project sub-goals are completed as per planned.

NLP skills:I also was given the task of designing and developing an AI psychological chatbot with the framework support of paddle and wechaty. It was a daunting task in which I was unfamiliar with any NLP models and chatbot and had to spend many hours learning how to train models and how to deploy on cloud servers. I also learnt how to write code to interact with the APIs of baidu to use cloud DL service.

Front end skills: As for the front end, I learnt how to make a website by wordpress and deploy it on a server.

Psychology skills: Most importantly, I learnt the huge needs of mental health and how to use psychology knowledge to study better and live happier.

Knowledge and Skill Application:

Learning wechaty and paddlepaddle give me the skills to train the NLP models and deploy a chatbot.The experience has also helped me to understand more about the reasoning system and how to develop an MVP project.

Through the different knowledge obtained from the project module, I will look out for opportunities to apply the knowledge to develop a Virtual Counselor better than human beings in the future. And I would use AI to try to understand more about psychology and then use the domain knowledge to benefit people around me.

Wang Kedi -- A0231356L

Personal Contribution:

--Business Idea :
Initial business idea proposition, includes background and solution analysis. Business plan template writing.

--Database Design:
Using software engineering methods, the database is established systematically, and the database design report is written to provide data support for Reasoning.

--NLP model implement (Keywords extraction and text matching)
Use TF-IDF algorithm to extract article keywords as article tags and use word vector based text matching algorithm to complete personalized recommendation of articles

--Video:
Report video editing and production

--Report :
Technical parts of the article and part of model.

Learning Outcome:

In this project, I have learnt that:

- How to systematically design a database, fully considering possible future needs.Robustness of thinking is very important for handling any work or life.
- Have a basic practice of the basic process of text processing, which is very useful for me
- The text keyword extraction algorithm can be used to extract the keywords in the article to quickly filter whether it matches the content you want to read. And can be used in the future word processing work process

Knowledge and Skill Application:

- Baidu's paddlepaddle is a good deep learning framework, which has many useful implementation methods and relatively inexpensive computing platforms. You can use itto do some machine learning deep learning work

- Navicat Premium has very good visual programming operations, and complex SQLlanguage can be realized by dragging and dropping, so it can be a good auxiliary work
- At the same time, it is very important to design the completeness of the database. In other scenarios, we must also consider what may happen, and reserve the interface implemented by the function

Ying Zhuozuo -- A0231534N

Personal Contribution:

--Business Idea :

Initial business idea proposition, includes background and solution analysis.

Business plan template writing.

--Database Design :

Database design using MySQL, includes questionnaire table, result table, user table and so on.

Database server creation and connection.

--Software prototype design :

Initial typesetting and webpage design using Modao.

--Front and Back-end Interaction Development :

Using flask, flask_sqlalchemy and pymysql to connect Flask and MySQL database. Add, delete, modify and query database using python code.

--Front End Web Development(Flask, HTML, CSS) :

Using Flask to render HTML templates and using CSS to control layout.

Using Echarts and JavaScript to draw charts and achieve interactive effects.

--Psychological Scale design :

Questionnaire investigation, modification and analysis.

--Video :

Technical introduction of webpage and questionnaire.

Business introduction of questionnaire.

--Report :

Technical parts of webpage and questionnaire.

Learning Outcome:

In this practice module, I acquire the knowledge of front-end and back-end in a short time. I learn how to use Flask and MySQL to complete back-end development, and how to use HTML, CSS and JavaScript to achieve web page design.

The whole working is a goal-driven procedure. I think about an idea of what I want to design and develop first, then learn how to achieve it. It is an efficient learning way, and helps me to achieve my goals.

Moreover, through this group project, I learn something about mental illness and how to avoid them, which is very helpful when I am under huge pressure.

Knowledge and Skill Application:

What I learned about Flask, HTML, CSS and JavaScript will help me in web page design. And I successfully use these knowledge to develop a simple presentation web page for other projects. And I will have more chances to be qualified as a front-end or back-end engineer. My python programming skill is also improved during this project.

The knowledge I learned about mental illness and how to avoid it will also be helpful at work. By Knowing more about it, I will be less interfered with by it.

Zong Jiulin -- A0231352U

Personal Contribution:

-- Business idea:

The initial proposal, including problem statement, background summary, use case analysis and solutions.

The later improvement which makes it a complete platform with functions closely related with each other

-- Market Research:

Investigating of the customer requirement, existing similar platforms, potential users and possible competitors

-- Promote Plan:

Including different promotion plan in the early, middle and late stage; promotion methods of online or offline, and the target customer of promotion

-- System Design:

Designing of the whole system, including making sure the functions required, the data flow and the relation between different modular, and make basic structure chart

-- Soft Requirement Analysis:

Including problem identification, analysis and synthesis, and review of whether the functions are complete and can fulfill users' requirements

-- Database Design:

Designing entities: user, administrator, article, questionnaire, questions

Designing relations: user_management, article_management, questionnaire_management and quetsionnaire_result

-- Front End Web Development:

Here I am responsible for our commercial website (wordpress) pages, including pages of about, questionnaire and article

-- Video:

Business overview, including problem statement, product value, use case demo and business model
-- Report:
Business part

Learning Outcome:

From this project I acquired both business skills and technical skills. For business as I was responsible for most of the business part, I learned to do commercial analysis including doing market research and investigating customers' requirements, which is knowing what kind of product we will make. Then, confirming the target group of users as well as potential competitors, and making product positioning. Also, we need to consider the promotion strategy and profit methods, which need to be attractive but not offensive.

From the front end development, I learned to create commercial web pages by Wordpress, and can use the components it provides relatively skillfully to achieve the desired visual effect.

For the database designing I can more reasonably design entities and relations and build tables more logically based on data flow.

Knowledge and Skill Application:

Learning the usage of Wordpress can help in future advertisement making and official commercial website designing. Including the designing of elements of the website, UI designing and content writing, and finally using Wordpress to create a relatively good website as soon as possible.

Also the business designing experience can help with future software designing and project designing, as we need to learn the market requirement and user needs, as well as avoid direct competition with strong competitors and make full use of the advantages of products or the shortage in the current market. Besides, the promotion plan making experience may be helpful in future advertising plan designing.