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Part 1 Introduction

Visualization interface: GUI

For the convenience of users, we have built a graphical user interface called a "GUI" using Python's Tkinter library. The "GUI" has the function of importing standard answers, student answers, and total scores. In addition, it can calculate the scores of student answers and analyze the difficulty of each question through the input files, and save the results in the corresponding Excel. The visualization interface is shown in Figure

1.

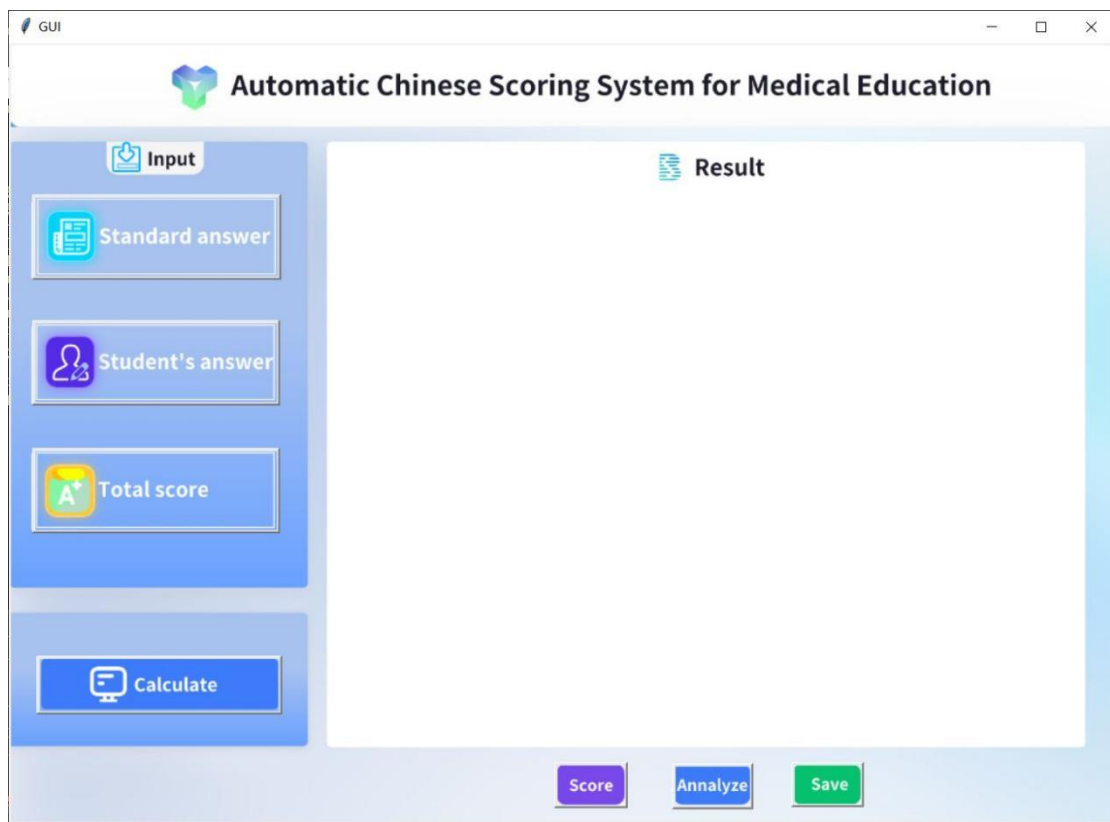


Figure 1: Visualization interface "GUI"

The interface consists of several parts: (1) Data import (upper left), including standard answers, student answers, and total scores. (2) The calculation button (bottom left) is used to rate students' answers. (3) Result display (upper right): After the program calculation is completed, a table will appear at this position to display the results. (4) The command buttons (bottom right) include "Rate", "Analyze", and "Save". The function of 'score' is to display the score of students' answers. The function of 'analysis' is to display the analysis of each issue. The function of 'save' is to save the results to an Excel file. The result interface is shown in Figure 2.

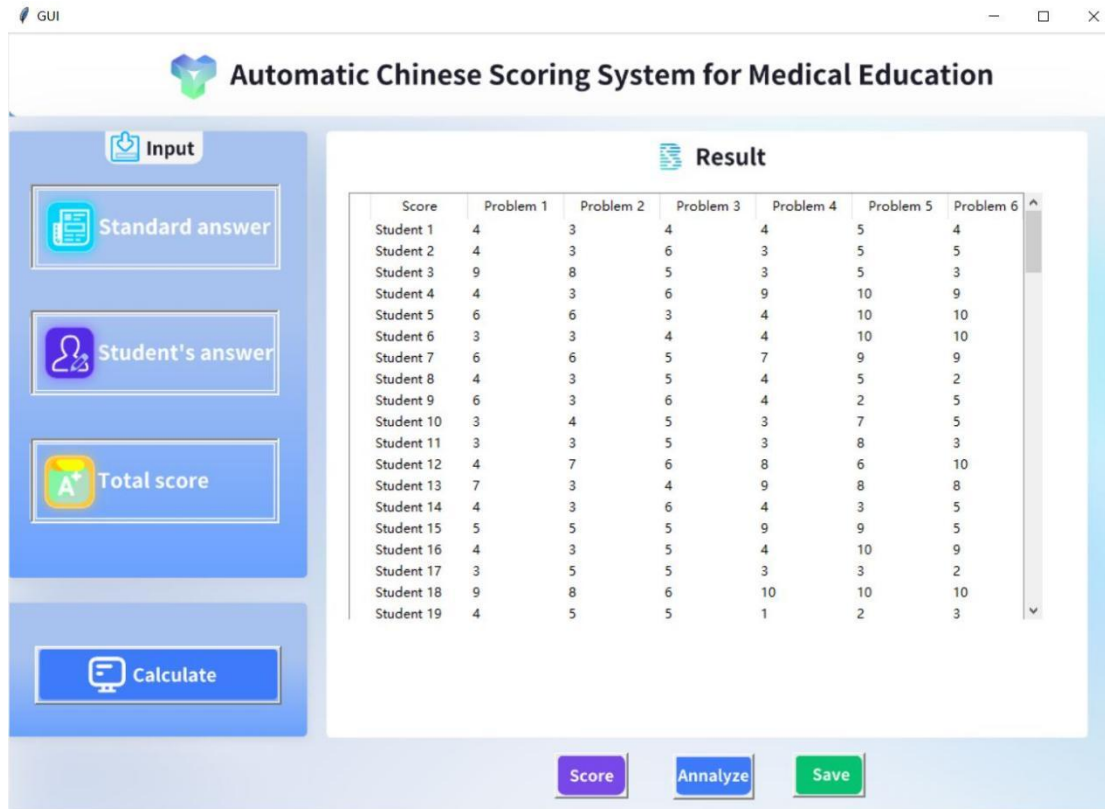


Figure 2: Result interface

Part 2 Input and Calculation

Step 1: Enter the standard answer

Click on the interface button 'Standard Answer' and input the corresponding file. It is worth noting that the suffix format for each input file 'standard answer' is '.xls', with the first column being the label for each question and the second column being the standard answer for each question. The process of entering standard answers is shown in Figures 3 and 4. The file format is shown in Table

1.

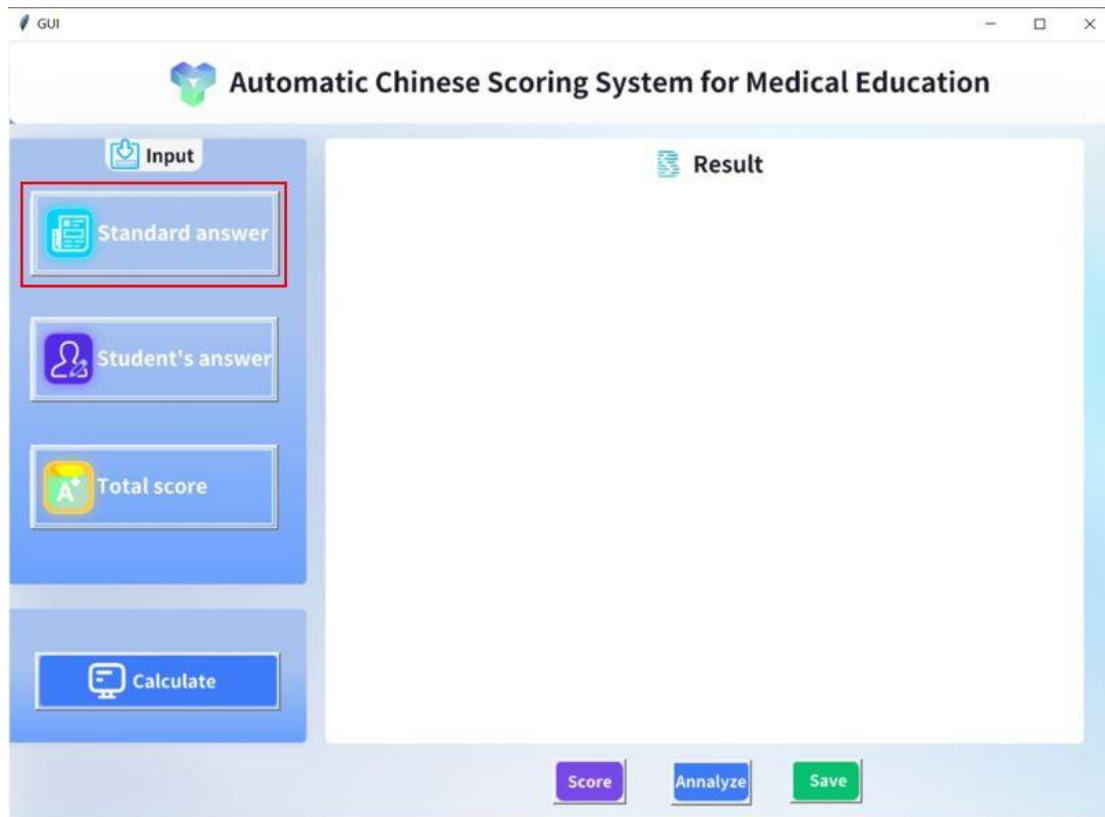


Figure 3: Click on the interface button 'Standard Answer'

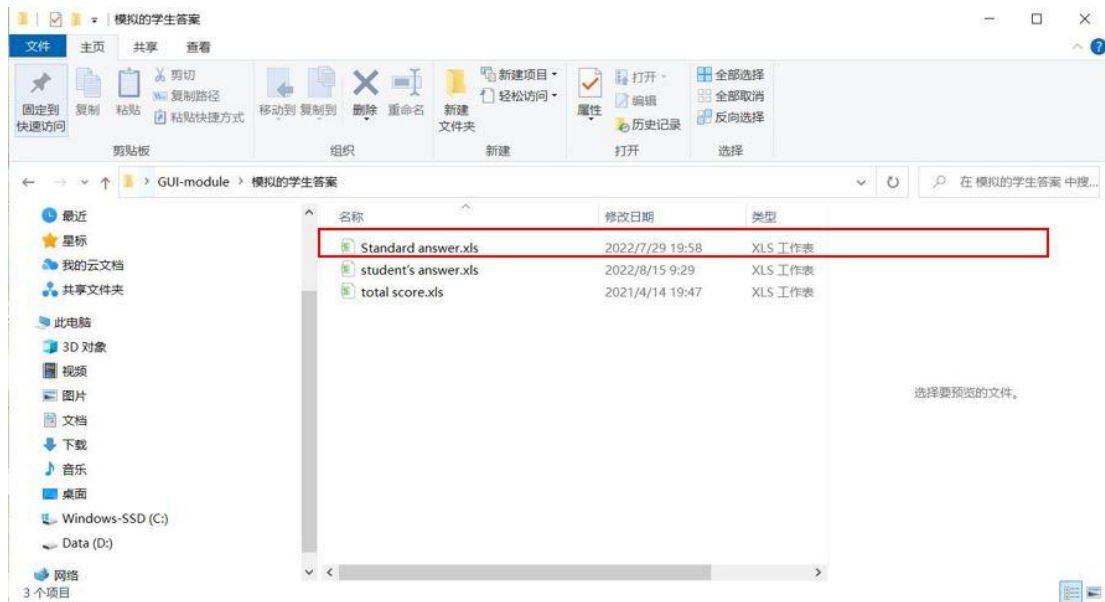


Figure 4: Input File "Standard Answer"

Table 1: File "Standard Answer" Format

problem	answer
1	健康相关行为：是指有助于个体在生理、心理和社会上保持良好状态、预防

	疾病的行为。它与健康信念密切相关，是个体为维持、实现、重建健康和预防疾病的活动。
2	自我效能理论：是个体对自己成功执行某行为并导致预期结果的信念，属于自信范畴。自我效能能在制定健康生活目标的意向阶段、具体行为改变阶段、防止复发过程中都具有重要的调节作用。自我效能来源于成功的经验、替代性经验、言语劝导和生理状态等四方面。
3	药物成瘾：是指强迫性、失去控制的用药行为，是药物的精神依赖性和生理依赖性共同造成的结果。能成瘾的药物具有引起精神愉悦或缓解烦恼的作用，这是触发条件。
4	酗酒：也称为酒精滥用或问题饮酒，它是造成躯体或精神损害或不良社会后果的过度饮酒。其特点是对饮酒不能自控，思想关注于酒，饮酒不顾后果；思维障碍；每一症状可以是持续或周期性的。
5	网络成瘾：是指慢性或周期性的对网络的着迷状态，不可抗拒的再度使用的渴望与冲动，上网后欣快，下网后出现戒断反应，出现生理或心理的依赖现象。
6	肥胖：是指体内过量脂肪堆积而使体重超过某一范围，当肥胖影响健康或正常生活及工作时才称为肥胖症。
7	心理健康：指心理的各个方面及活动过程处于一种良好或正常的状态。
8	个性化：指在大众化的基础上增加独特、另类、拥有自己特质的需要，独具一格，别开生面的一种说法。打造一种与众不同的效果。
9	沟通：指人与人之间、人与群体之间思想与感情的传递和反馈的过程，以求思想达成一致和感情的通畅。
10	记忆：指人脑对经验过事物的识记、保持、再现或再认，它是进行思维、想象等高级心理活动的基础。
11	家庭治疗：指以家庭为对象实施的团体心理治疗模式，其目标是协助家庭消除异常、病态情况，以执行健康的家庭功能。
12	精神过滤：指不看整体，仅将注意力集中于消极的细节上。
13	理智感：指在认识和评价事物过程中所产生的情感。
14	情绪反应：指喜、怒、悲、恐时所表现出的形为，是植物性神经系统的一系列反应。
15	认知疗法：是根据人的认知过程，影响其情绪和行为的理论假设，通过认知和行为技术来改变求治者的不良认知，从而矫正并适应不良行为的心理治疗方法。

Step 2: Enter students' answers

Click on the interface button 'Student Answer' and input the corresponding file. It is worth noting that the suffix format for each file 'student answer' is '.xls'. The first column is the label for each question, and the beginning of the second column is the student's answer. The process of inputting student answers is shown in Figures 5 and 6. The file format is shown in Table 2.

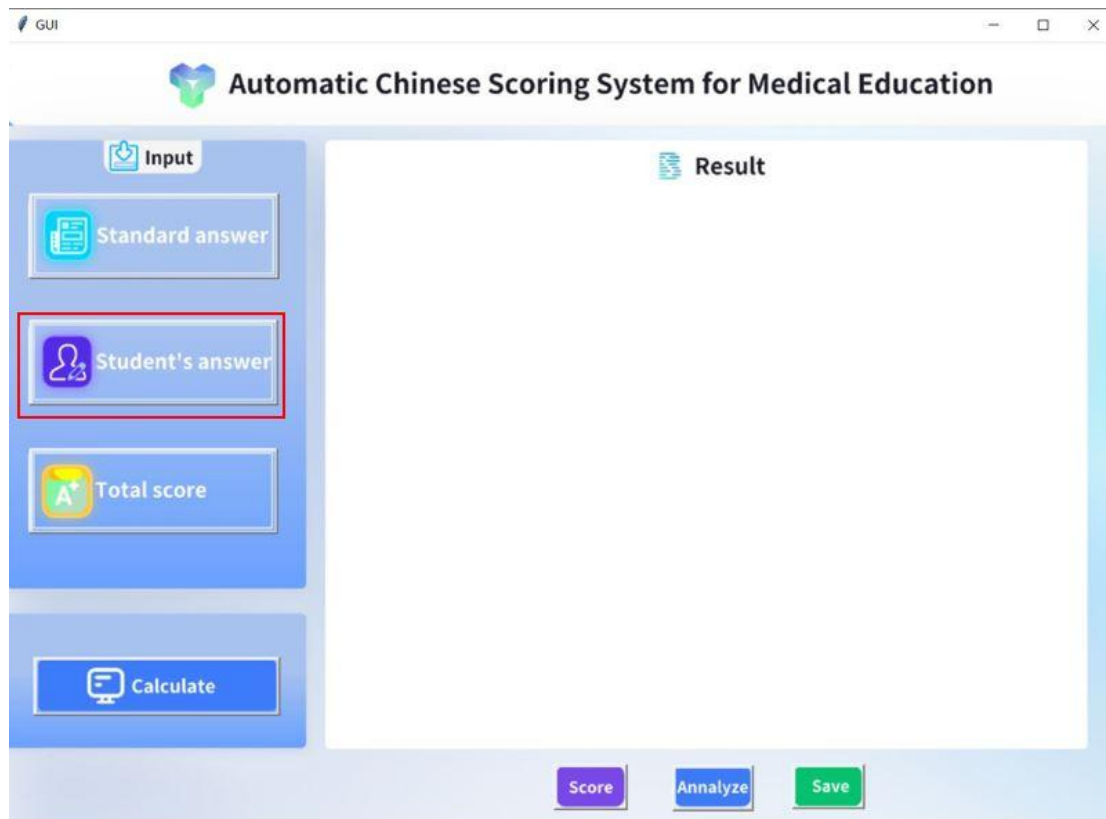


Figure 5: Click on the interface button 'Student's Answer'



Figure 6: Input File "Student Answers" Table 2:
File "Student Answers" Format

Question	1631250023
1	健康相关行为：任何与疾病预防、增进健康、维护及恢复健康相关的行动。这类行为均可以是自愿的，也可能是不自愿的；可以直接从健康为目的的主动行为，也可以遵守法律或规定的被动行为。
2	自我效能理论：人对自己是否能够成功地进行某一成就的主观判断，它与自我能力感是同义的。这种理论认为，即便人的行为没有对自己产生强化，但由于人对行为结果所能带来的功效产生期望，可能会主动性的进行那一活动。
3	药物成瘾：是指药物与躯体相互作用而引起精神及躯体方面的改变患者为再度体验药物所致的兴奋感、舒适感，而周期地、持续地使用某种药物。
4	酗酒：指无节制地过量饮酒，能使人不同程度地丧失和降低自控能力，实施某种有伤风化或违法犯罪的行为，各国刑法和犯罪学家都认为酗酒行为有一定的社会危害性，但对危害的严重程度认识不同。
5	网络成瘾：是上网者由于长时间地和习惯地沉浸在网络时空当中，对互联网产生强烈地依赖，以至于达到了痴迷的程度而难以自我解脱的行为状态和心理状态。
6	肥胖：一定程度的明显超重于脂肪层过厚，是体内脂肪，尤其是甘油三酯积聚过多而导致的状态，由于食物摄入过多造成体重过度增长并引起人体病理，生理改变或潜伏。
7	心理健康：心理的各个方面及活动过程处于一种良好或正常的状态。
8	个性化：在大众化的基础上增加独特、另类、拥有自己特质的需要，独具一格，别开生面的一种说法。打造一种与众不同的效果。
9	沟通：人与人之间、人与群体之间思想与感情的传递和反馈的过程，以求思想达成一致和感情的通畅。
10	记忆：人脑对经验过事物的识记、保持、再现或再认，它是进行思维、想象等高级心理活动的基础。
11	家庭治疗：以家庭为对象实施的团体心理治疗模式，其目标是协助家庭消除异常、病态情况，以执行健康的家庭功能。
12	精神过滤：不看整体，仅将注意力集中于消极的细节上。
13	理智感：在认识和评价事物过程中所产生的情感
14	情绪反应：喜、怒、悲、恐时所表现出的形为，是植物性神经系统的一系列

	反应。
15	认知疗法：是根据人的认知过程，影响其情绪和行为的理论假设，通过认知和行为技术来改变求治者的不良认知，从而矫正并适应不良行为的心理治疗方法。

Step 3: Enter the total score

Click on the interface button 'Total Score' and enter the corresponding file. It is worth noting that the suffix format for each total score file is ".xls". Moreover, the first column is the label for each question, and the second column is the full score for each question. The process of inputting the total score is shown in Figures 10 and 11. The file format is shown in Table 5.

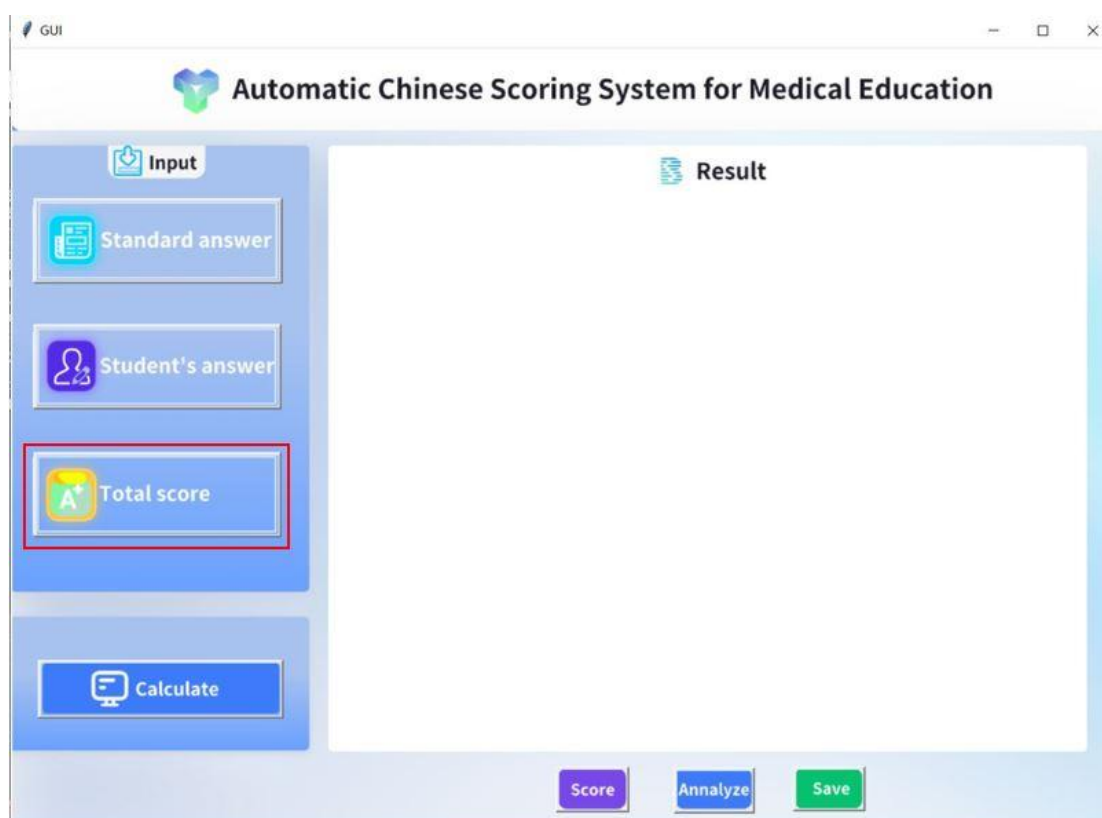


Figure 11: Click on the interface button 'Total Score'

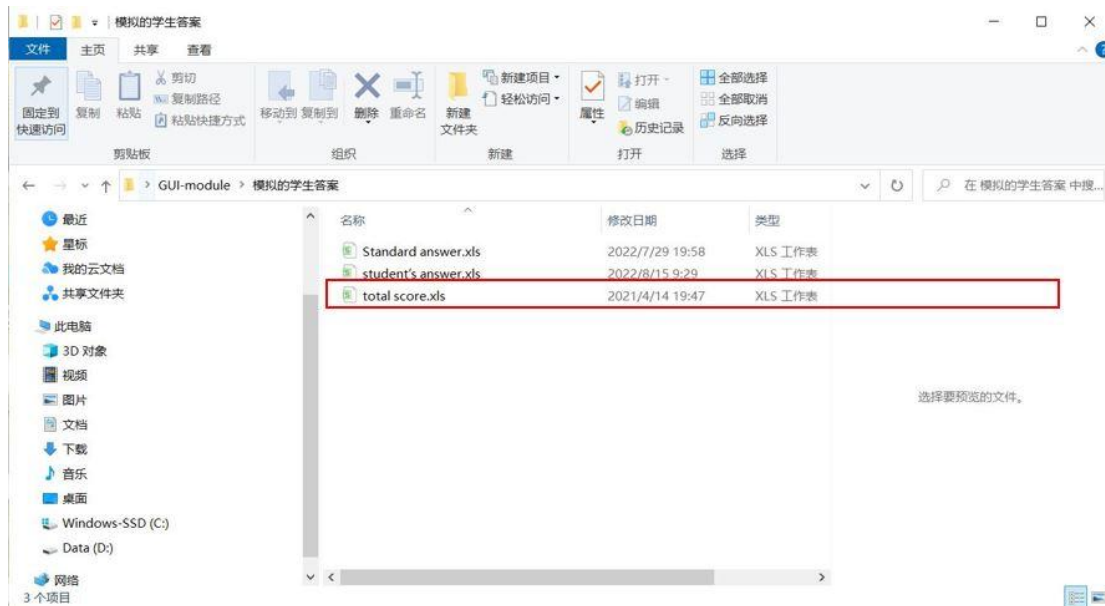


Figure 12: Input File "Total Score"

Table 5: File "Total Score" Format

问题	总分
1	10
2	10
3	10
4	10
5	10
6	10
7	10
8	10
9	10
10	10
11	10
12	10
13	10
14	10
15	10

Step 4: Click on the "Calculate" button

Click on the interface button 'Calculate'. The calculation process will be displayed in the 启动程序.exe, as shown in Figure 13. A large amount of data needs to be calculated here, which will take approximately 2 hours. Please be patient and wait. The corresponding result will appear after calculation, As shown in Figure 14.



Figure 13: calculation process

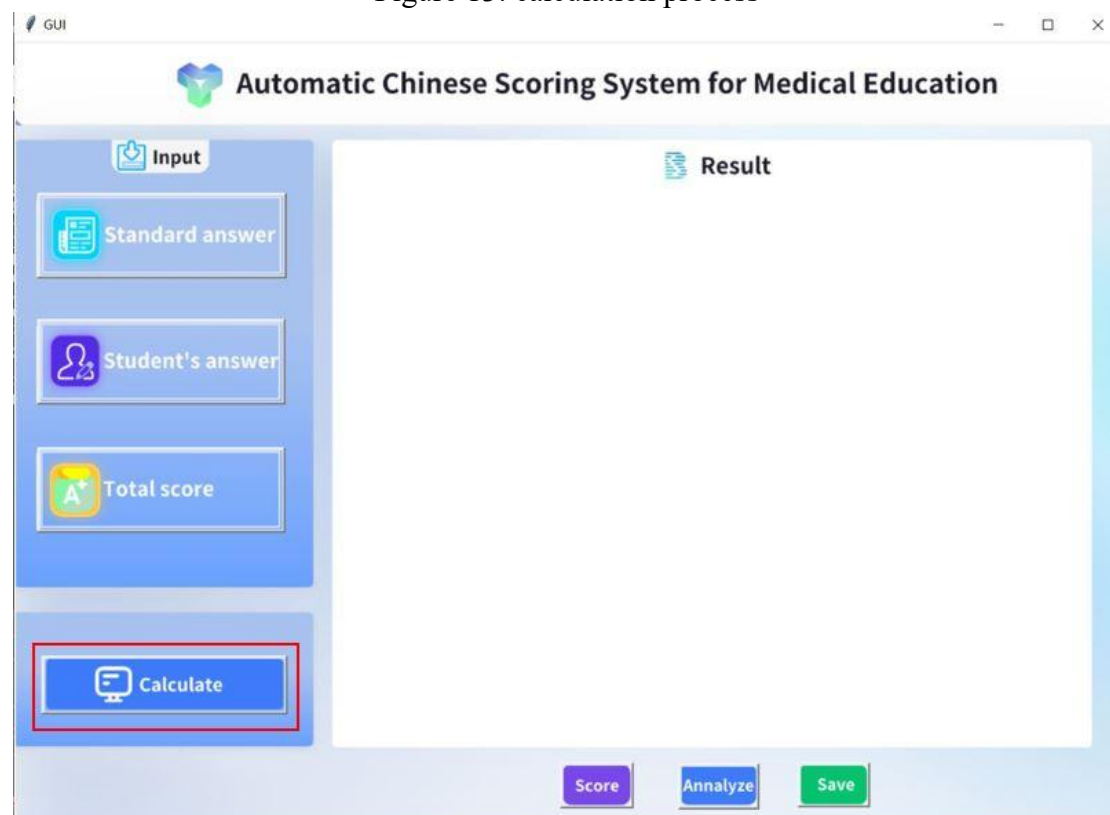


Figure 14: Click on the interface button 'Calculate'

Part 3 Results and Command Buttons

Display Results

When calculating the scoring results, the score of the student's answer will be displayed under "Results", as shown in Figure 15.

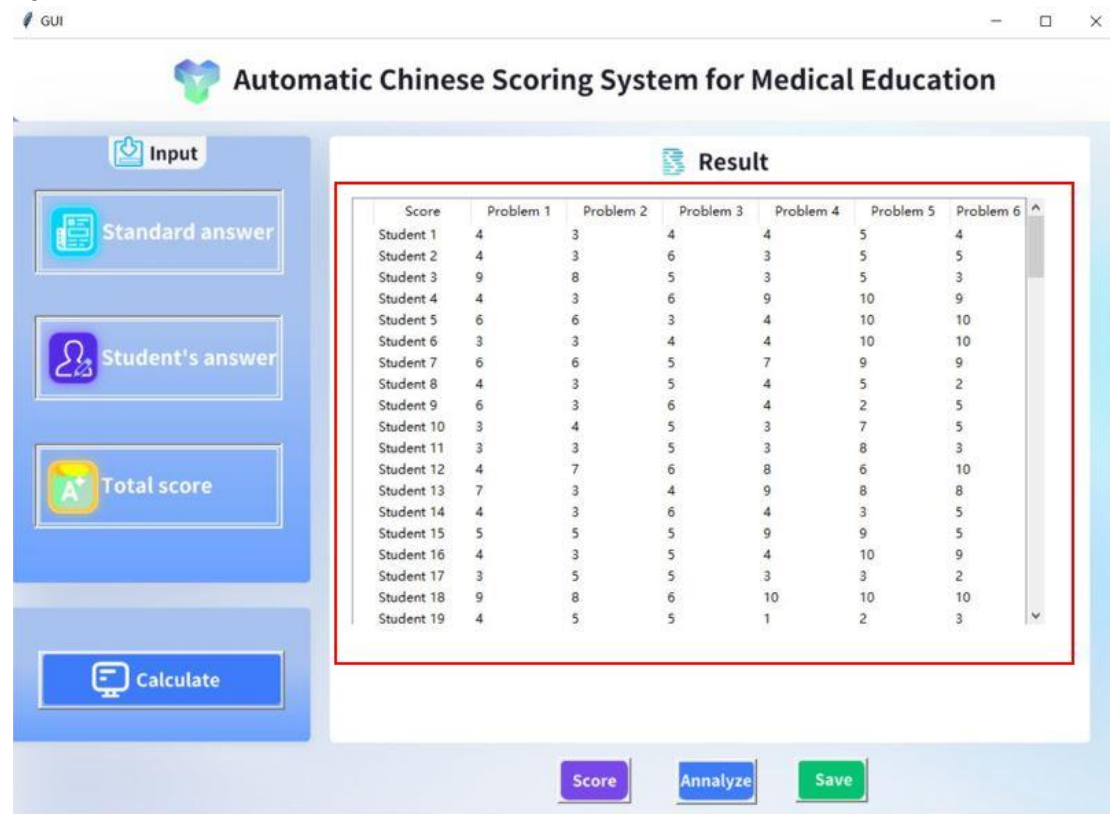


Figure 15: Display Results

command button

The button 'Score' enables the display results to display the score of each student's answer, as shown in Figure 16. Due to the size of the interface, only 6 questions and each student's score can be displayed in the 'GUI'. However, the results saved through the 'Save' button will display the complete results.



Figure 16: Function "Score"

The 'Analysis' button enables the display of results to display some analysis of each issue. In the "GUI" interface, due to the size of the interface, only "lowest score", "highest score", "degree of diversity", and "coefficient of difference" can be displayed. The results are shown in Figure 17. However, the results saved through the "Save" button will be analyzed more.



Figure 17: Function "Analysis"

The 'Save' button saves the results to an Excel file. The document will be published in "GUI.exe" in the same directory, named "Result.xlsx". This file has two tables called "Score" and "Analysis". Save the scores of student answers and the analysis of each question, as shown in Figure 18.

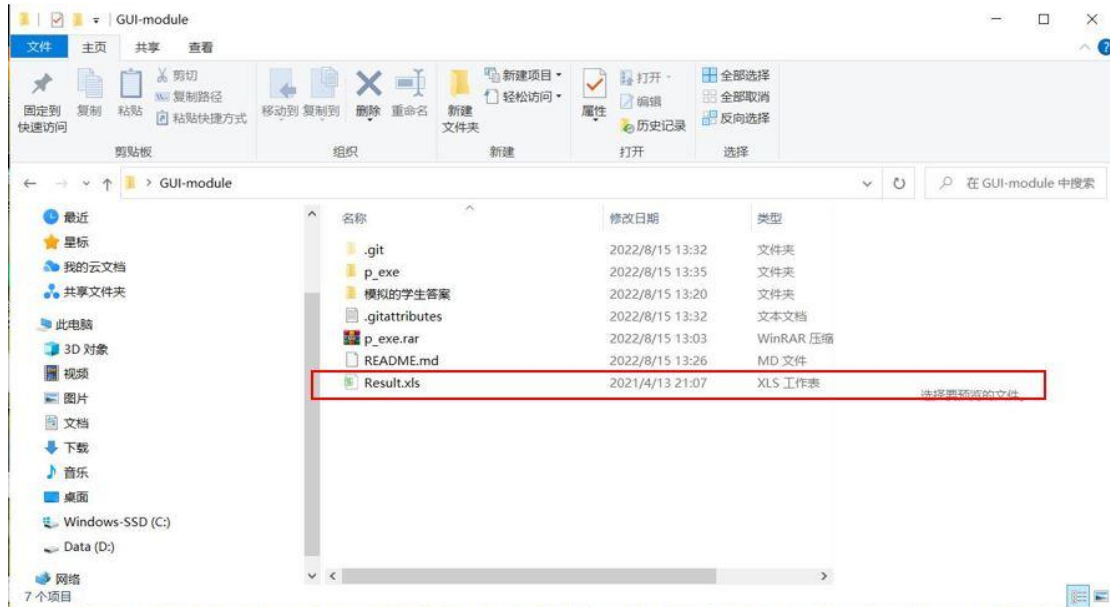


Figure 18: Results.xlsx