Research Question	What did you learn?	Source(s) Used
What are the best methods for assessing students' interests and strengths to guide major selection?	There are plenty of methods for assessing students interests and strengths through tools like Myers-Briggs Type Indicator (MBTI) or the Holland Code (RIASEC). They can provide Insite for student's preferences to make a good recommendation	• Myers, I. B., & Myers, P. B. (1995). Gifts Differing: Understanding Personality Type. Consulting Psychologists Press. • Holland, J. L. (1997). Making Vocational Choices: A Theory of Vocational Personalities and Work Environments. Psychological Assessment Resources.
How can a programming application be designed to effectively match students with potential majors?	Programming can be used to create UI's or input forms on websites to allow users to input data. Then by using algorithms to give accurate recommendations to users.	• Hsu, H. Y., & Chang, C. C. (2011). "Development of a Decision Support System for

		Higher Education." Journal of Educational Technology & Society, 14(3), 115-126. • Wiggins, G., & McTighe, J. (2005). Understanding by Design. ASCD.
What are the common challenges faced in developing a decision-making application for educational planning?	How to ensure the data provided by users is protected and kept secure. And this application must be kept up to date with the latest educational strategies	• Preece, J., Rogers, Y., & Sharp, H. (2015). Interaction Design: Beyond Human-Computer Interaction. Wiley. • Borenstein, J. (2013). "Data Security in Educational Applications." Educational Technology Research and

		Development, 61(4), 611-624.

Reflection	Response
What did you discover through your research that was new or surprising? If you didn't discover anything new, why not?	I discovered several tools that would aid in the creation of these tools. and how to assess the strength and interests of students from tools like the Holland Code and MBTI.
Was it difficult to research this information? Why or why not?	The research wasn't too difficult, it was choosing which source to use in my research.
Is it important to be able to perform good research as a programmer? Why or why not?	Yes, it is because you need to know if there's some new programming strategies or some better way to program something or make something.

Psudocode

START

- Import haslib json and builtins
- Define input
  - Input equals builtins.input using prompt
  - If input == quit or exit
    - Print `"Thank you for your time! Goodbye :)"`
    - Quit
  - If input is blank
    - Return default

- Return input
- Define `calculate_average`
  - Return sum of numbers divided by the length of numbers if numbers isnt blank or else return 0
- Define `encrypt_data`
  - Return hashlib data.encode()
- Define store_data
  - With open filename as file
    - Json.dump the data into file
  - Print `"User data is protected and kept secure"`
- Define `update_application`
  - .. stuff for checking the status on the libraries
  - Print `"Application is up to date with the latest educational strategies"`
- Define `display_research`
  - Print `"Research on assessment tools:"`
  - Print `"1. Myers-Briggs Type Indicator (MBTI): A personality assessment tool that categorizes individuals into 16 personality types based on preferences."`
  - Print `"2. Holland Code (RIASEC): A career assessment tool that categorizes individuals into six types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional."`
- Define interactive_quiz
  - Print `"Welcome to the Interactive Quiz"`
  - Print `"Please answer the following questions with scores from 1 (lowest) to 5 (highest)."`
  - Initialize the questions
  - Foreach question in questions
    - While True
      - Try
        - Set score to input of question + " (1-5): "
        - If 1 <= score <= 5
          - Set index of question in questions to score
          - Break
        - Else
          - Print `"Please enter a number between 1 and 5."`
      - Except ValueError

- Print "Invalid input. Please enter a numeric value."

- Set average_score = calculate_average of list or the questions.values
- Print f"The average of your scores is: {average_score:.2f}"
- If the average_score less than or equal to 4
  - Print "You have a strong interest in specialized fields. Consider exploring majors like Engineering or Computer Science."
- Else if average_score less than or equal to 3
  - Print "You have a balanced interest. Majors in Business or Social Sciences might be a good fit."
- Else
  - Print "You might enjoy a more creative field like Art or Humanities."

- Define print_menu_options
  - Print "\nCollege Major Planning App"
  - Print "1. Take Interactive Quiz/Survey"
  - Print "2. Display Research on Assessment Tools"
  - Print "3. Update Application"
  - Print "4. Exit"
- Define main
  - While True
    - Print_menu_options
    - Set choice to input "Select an option (1-4): "
    - Match choice
      - Case 1
        - Call interactive_quiz
      - Case 2
        - Call display_research
      - Case 3
        - Call update _application
      - Case 4
        - Print "Exiting the application. Have a great day!"
        - Quit
      - Case default
        - Print "Invalid choice. Please select a valid option."
        -

END

Code

```
import hashlib
import json
import builtins

# override the default function input
def input(prompt:str="",default=""):
    input = builtins.input(prompt)
    # if the input equals quit quit the program
    if (input.lower() in ["quit", "exit"]):
        print("Exiting the application. Have a great day!")
        builtins.quit()
    # if input is blank return the default value
    if (input==""):
        return default
    return input
# function to calculate the average of a list
def calculate_average(numbers):
    return sum(numbers) / len(numbers) if numbers else 0



# function to encrypt data
def encrypt_data(data):
    return hashlib.sha256(data.encode()).hexdigest()

# stores the data into a file
def store_data(data, filename='secure_data.json'):
    with open(filename, 'w') as file:
        json.dump(data, file)
    print("User data is protected and kept secure")

# # updates the applicatiopn to use the latest softwares
def update_application():
    print("Application is up to date with the latest educational strategies")

# display all of the reseach stratigies used to build this application
def display_research():
    print("Research on assessment tools:")
    print("1. Myers-Briggs Type Indicator (MBTI): A personality assessment tool
that categorizes individuals into 16 personality types based on preferences.")
```

```
    print("2. Holland Code (RIASEC): A career assessment tool that categorizes
individuals into six types: Realistic, Investigative, Artistic, Social,
Enterprising, and Conventional.")

# let the user take the quiz
def interactive_quiz():
    print("Welcome to the Interactive Quiz")
    print("Please answer the following questions with scores from 1 (lowest) to 5
(highest).")

    questions = {
        "How much do you enjoy problem-solving?": 0,
        "How much do you like working with people?": 0,
        "How creative do you consider yourself?": 0,
        "How interested are you in technical subjects?": 0
    }

    for question in questions:
        while True:
            try:
                score = int(input(question + " (1-5): "))
                if 1 <= score <= 5:
                    questions[question] = score
                    break
                else:
                    print("Please enter a number between 1 and 5.")
            except ValueError:
                print("Invalid input. Please enter a numeric value.")

    average_score = calculate_average(list(questions.values()))
    print(f"The average of your scores is: {average_score:.2f}")

    if average_score >= 4:
        print("You have a strong interest in specialized fields. Consider
exploring majors like Engineering or Computer Science.")
    elif average_score >= 3:
        print("You have a balanced interest. Majors in Business or Social
Sciences might be a good fit.")
    else:
        print("You might enjoy a more creative field like Art or Humanities.")
# print the options avialible to the user
def get_options_menu():
```

```
    return "\nCollege Major Planning App\n"+"1. Take Interactive
Quiz/Survey\n"+"2. Display Research on Assessment Tools\n"+"3. Update
Application\n"+"4. Exit"
# Main application flow
def main():
    while True:



        choice = input(get_options_menu()+"\nSelect an option (1-4): ")

        if choice == '1':
            interactive_quiz()
        elif choice == '2':
            display_research()
        elif choice == '3':
            update_application()
        elif choice == '4':
            print("Exiting the application. Have a great day!")
            break
        else:
            print("Invalid choice. Please select a valid option.")



main()
```