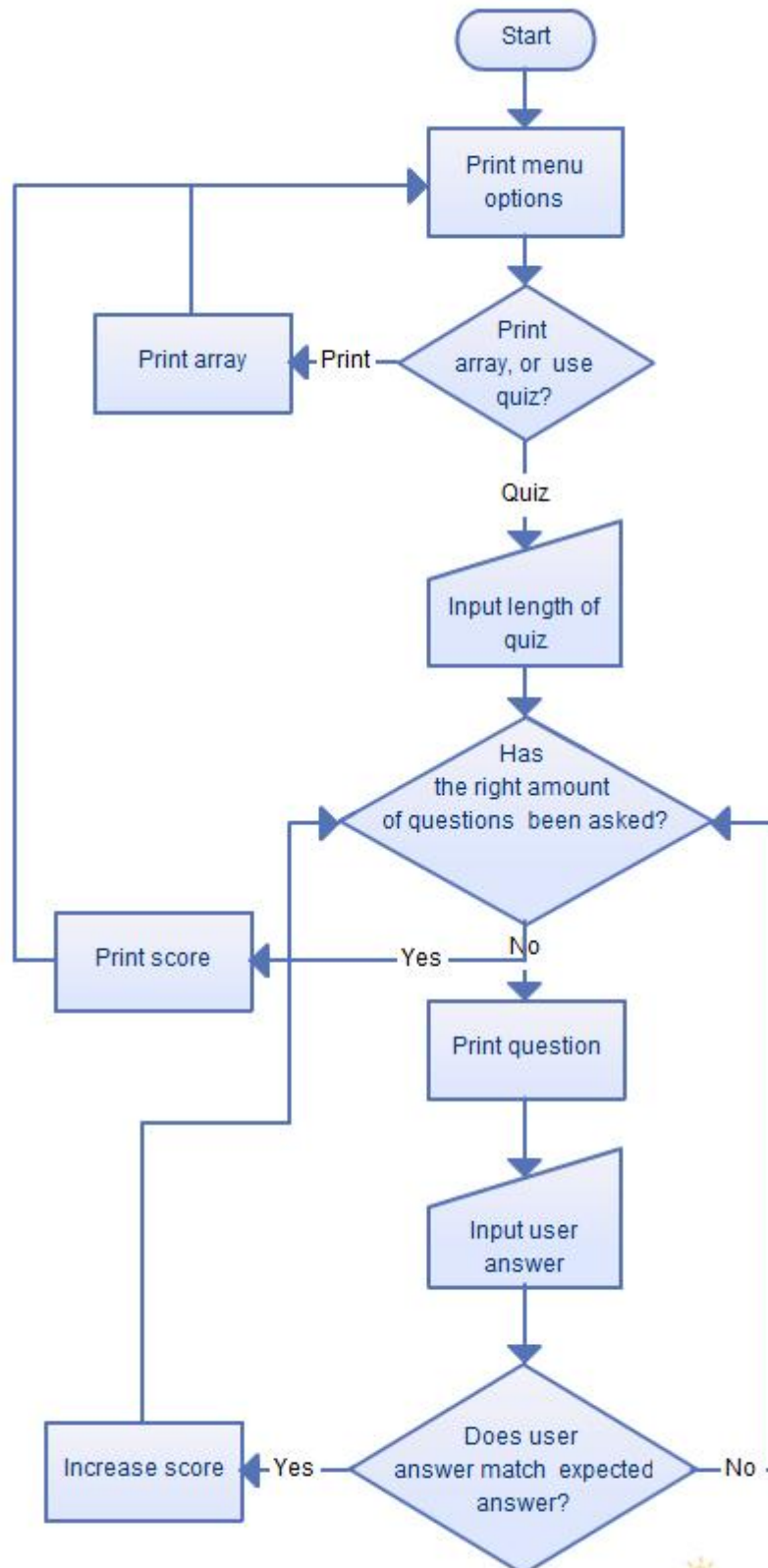


Criterion B: Design

Processing: Flowchart:

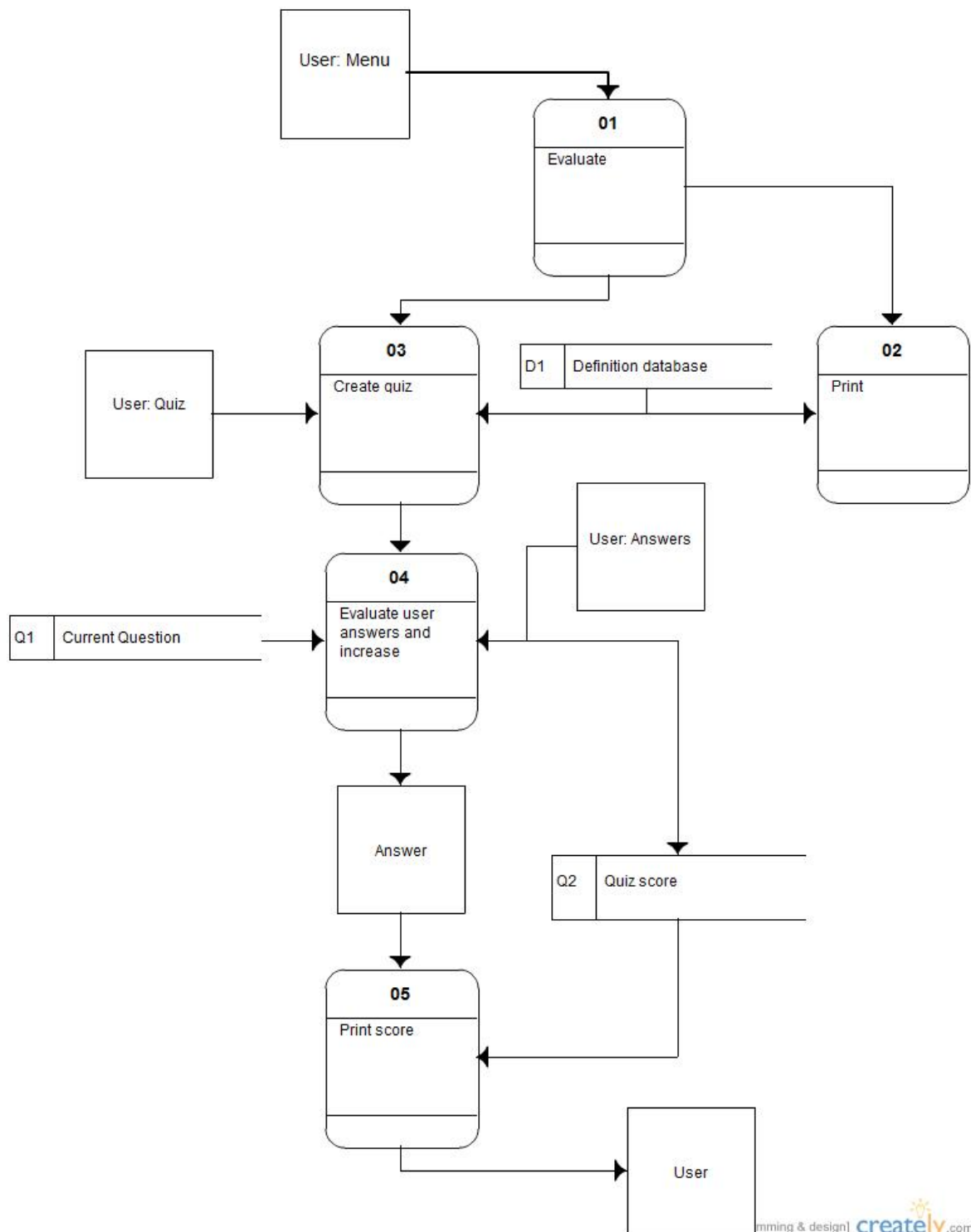
- Shows desired functionality from the 'menu' class



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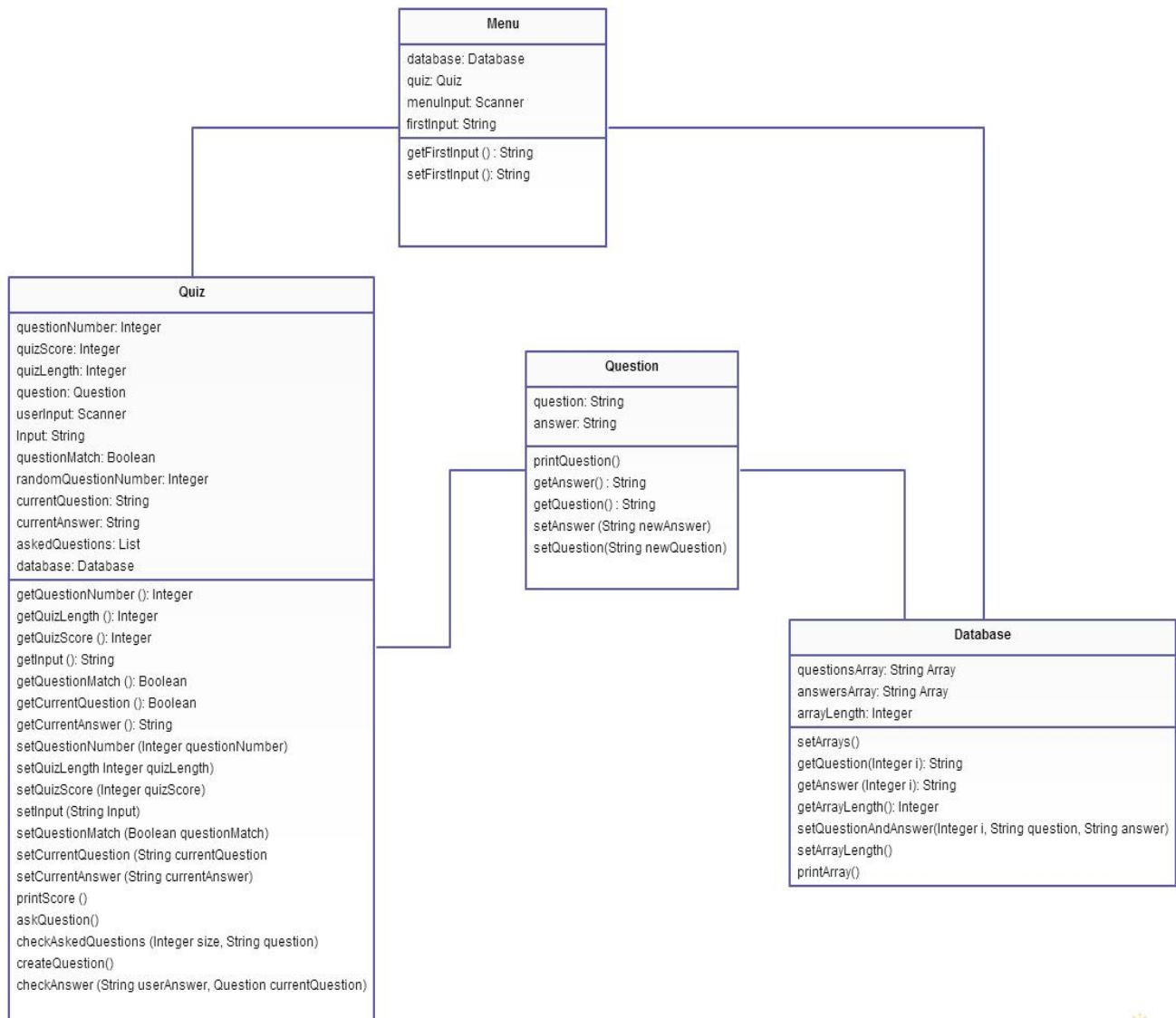
Data Flow Diagram

- Showing proposed flow of data through the program
- 01 allows user to navigate menu – requires error handling
- 02 prints arrays of definitions
- 03 runs the quiz – evaluates random output in creating the quiz
- 04 checks user answers – evaluating user input and data validation
- 05 prints user score



Development: Overall Class Structure

- Shows proposed classes to be programed and the way in which they interlink
- Arrays used in database class
- Error handling in menu
- quiz class generates and evaluates random output



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Development Plan**#1 – Creating a database**

- Create a class to hold the definitions and answers
- Split the arrays into questions and answers
- Populate both and ensure corresponding answers
- Ensure functionality of printing array

PSEUDOCODE FOR PRINTING THE ARRAY

```

I = 0
WHILE I <= ARRAYLENGTH
    print answer of index I
    I ++

```

#2 – Creating a quiz class

- Create a Quiz and Question class
- Randomly generates answers from the Database class
- Allows user input and the checking of answers against those expected
- Allow tallying of score and setting of quiz length
- Prevent repetitions of questions

PSEUDOCODE FOR QUIZ CLASS

```

request QUIZLENGTH
QUESTIONNUMBER = 0
SCORE = 0
while QUIZLENGTH >= QUESTIONNUMBER
    get random QUESTION and ANSWER from Database
    if QUESTION has been asked
        new Question
        Question.QUESTION = QUESTION
        Question.ANSWER = ANSWER
        print Question and request USERANSWER
        if USERANSWER == Question.ANSWER
            SCORE++
            QUESTIONNUMBER++
    else
        continue
print SCORE

```

#3 – Create a menu

- Allow user to control functionality – quiz or print
- Allow user to set length of the quiz

PSEUDOCODE FOR MENU CLASS

```

if USERINPUT == "quiz"
    get QUIZLENGTH
    new Quiz of QUIZLENGTH
if USERINPUT == "print"
    new Database
    print arrays

```

Test Plan

Test Number	Description	Input Data/Instructions	Expected Results
1	Database function; is it able to store and show key words and definitions?	User inputs 'print' on the menu. Prints the key words and their definitions.	This should print the key words and their definitions for the user. The key words and definition should correspond. Show success criteria of printing the definitions.
2	Quiz 'random call' Function	Call method in quiz class which calls a random definition from database class.	A random definition should appear, asking for the user to input the keyword. No question should be repeated. Shows success criteria of creating a random quiz.
3	Correction check	Call random call method, input correct answer to definition. Repeat but with incorrect answer.	When answer is correct the output should confirm this. Show success criteria of evaluating answers.
4	Incorrect answers	Repeat but with incorrect answer.	When answer is incorrect the program should offer the correct key word. Show success criteria of correcting questions.
5	Quiz length error correction	User inputs invalid quiz length. Both out of integer range and of a different data type (i.e. 100, or 45.4).	The program should request a valid input, and continue running without creating a quiz. Shows success criteria of varying the length of the quiz.
6	Create quiz	User inputs valid quiz length. Run through questions and check they are the correct number of questions. Run quiz 3-4 times.	There should be the defined amount of random questions. The score should be recorded each time and displayed at the end of each quiz. Shows success criteria of testing the user on key definitions for biology A level.
7	Check 'close' function	Run a quiz and input 'close' to exit the quiz.	Inputting close should return the program to the menu. At the menu inputting close should exit the program.