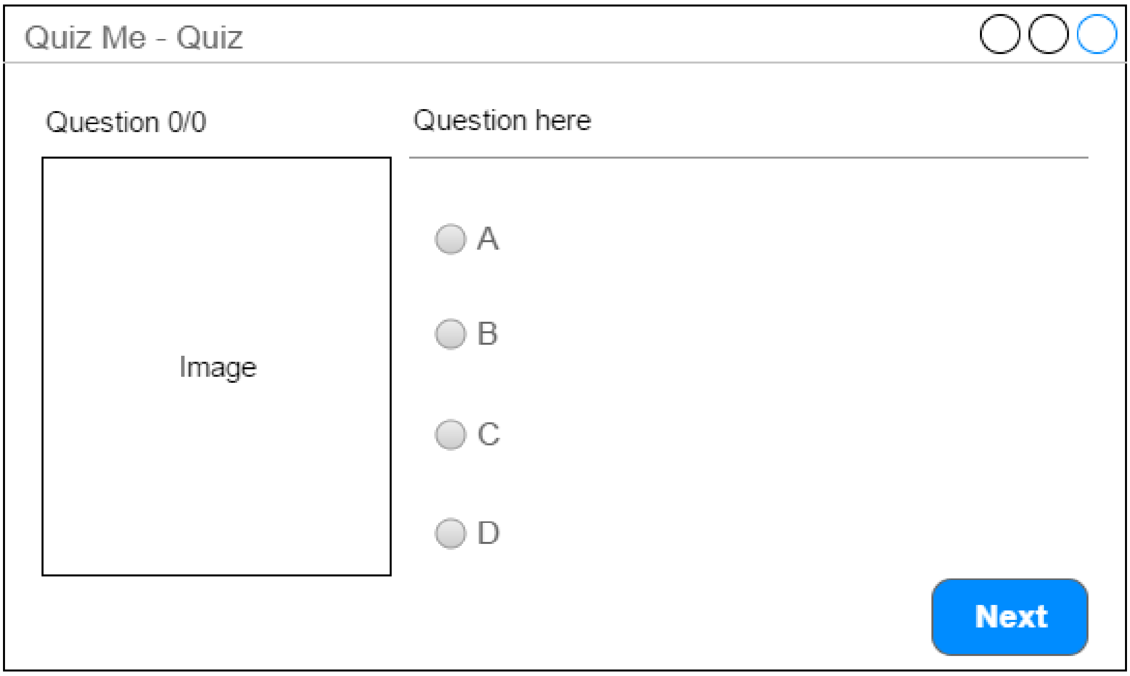
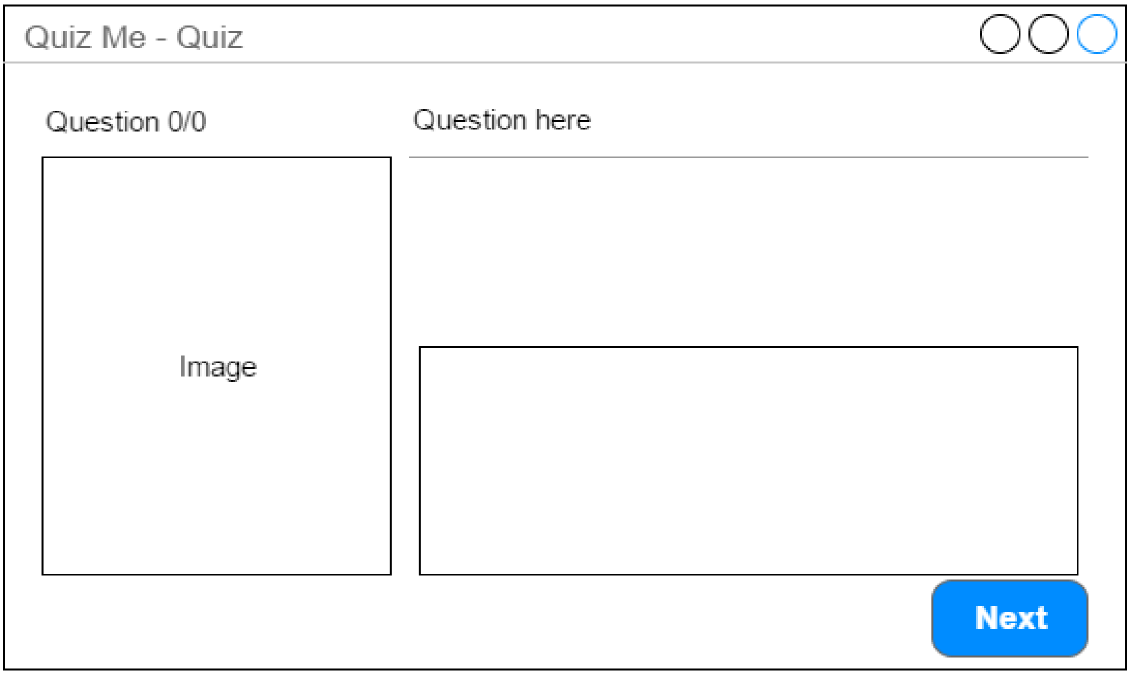
Programming Assignment – Screen Designs

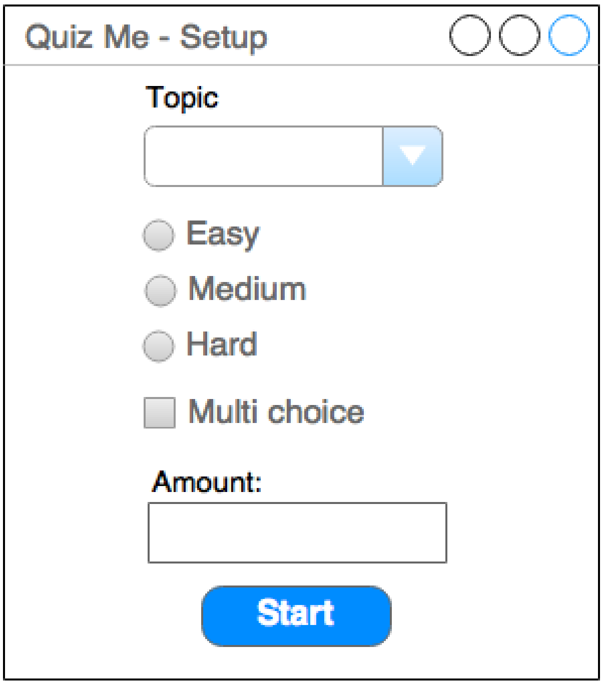
Program description: My program is a quiz based system that allows users to take randomized quizzes generated by the program itself dynamically at runtime. The user then receives feedback of their performance by the system.

Multiple choice mode

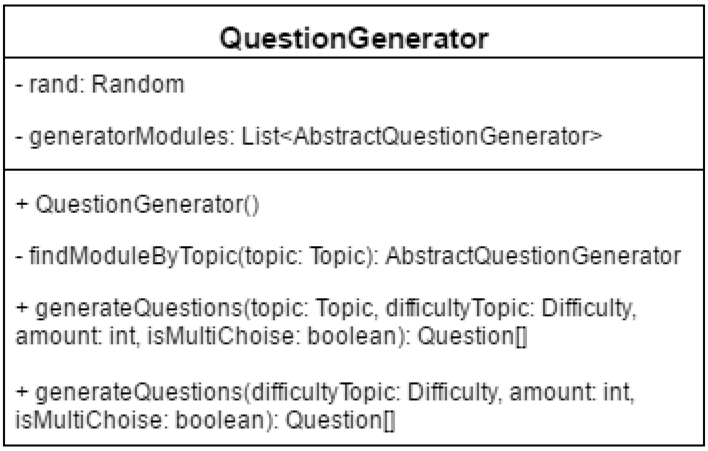


Non multiple choice mode





Class diagrams



QuestionGenerator

- rand: Random

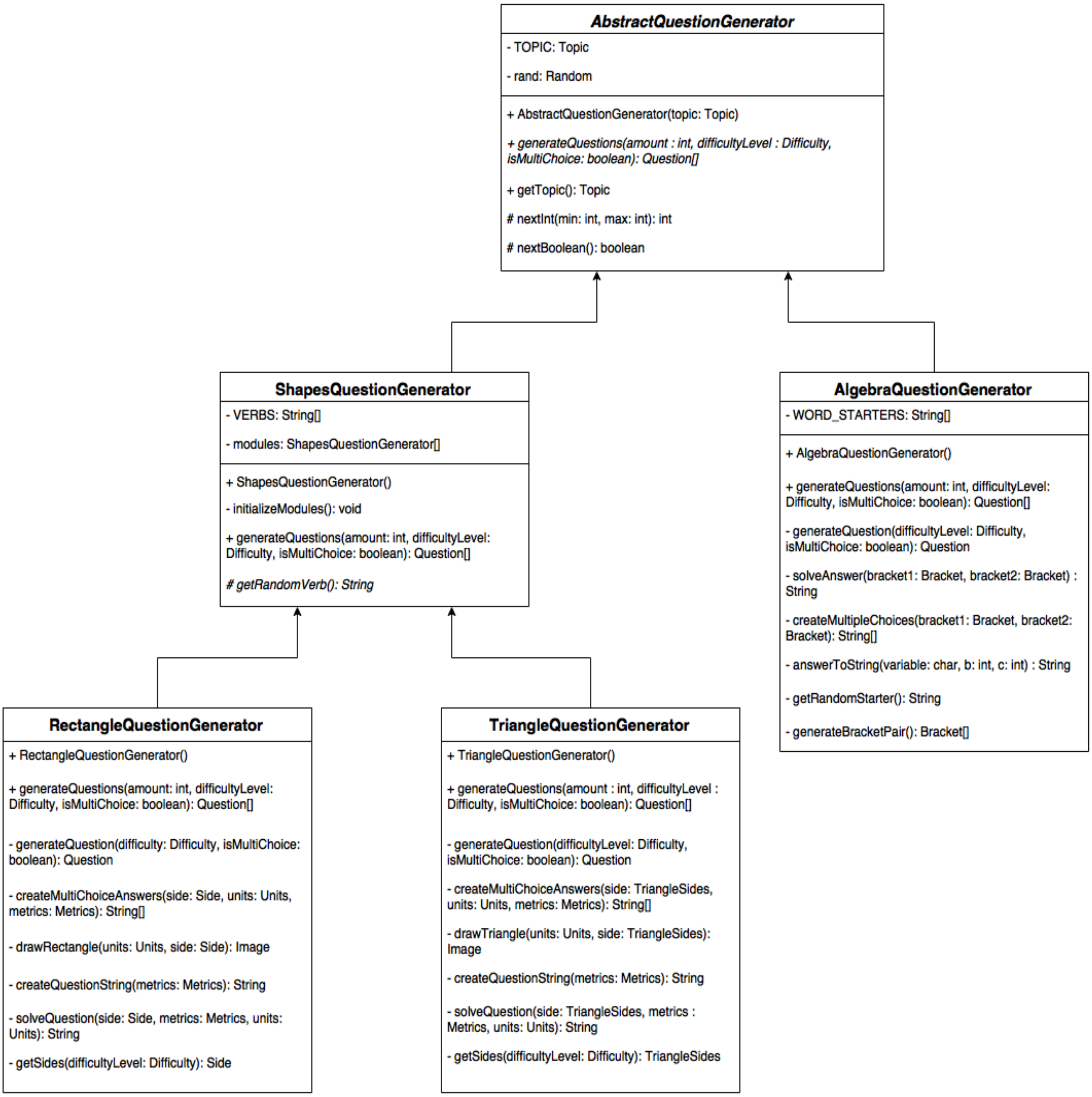
- generatorModules: List<AbstractQuestionGenerator>

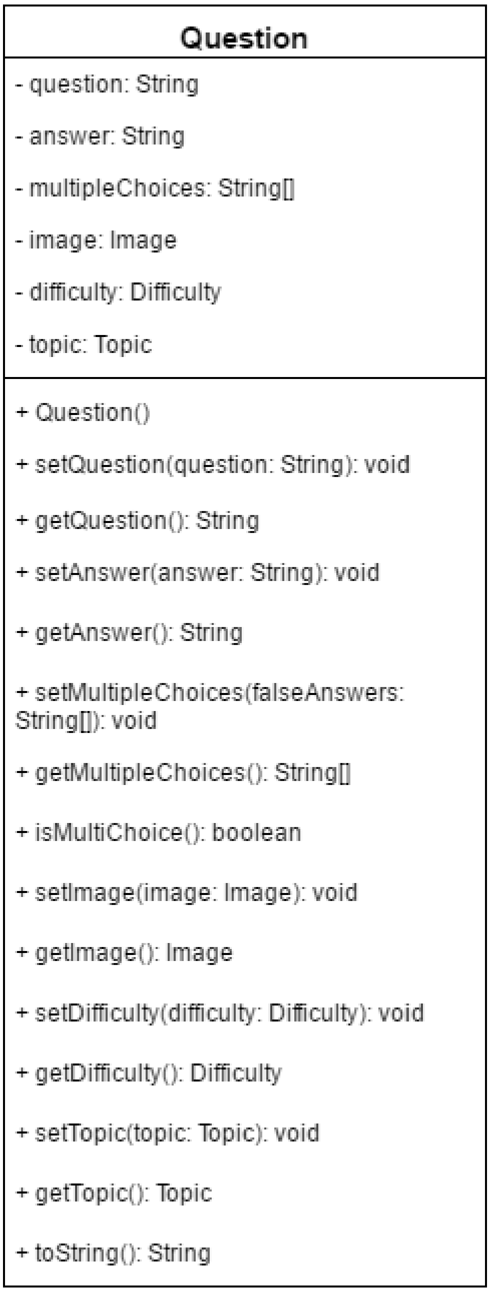
+ QuestionGenerator()

- findModuleByTopic(topic: Topic): AbstractQuestionGenerator

+ generateQuestions(topic: Topic, difficultyTopic: Difficulty, amount: int, isMultiChoise: boolean): Question[]

+ generateQuestions(difficultyTopic: Difficulty, amount: int, isMultiChoise: boolean): Question[]


AbstractQuestionGenerator
- TOPIC: Topic
- rand: Random
+ AbstractQuestionGenerator(topic: Topic)
+ generateQuestions(amount : int, difficultyLevel : Difficulty, isMultiChoice: boolean): Question[]
+ getTopic(): Topic
# nextInt(min: int, max: int): int
# nextBoolean(): boolean
ShapesQuestionGenerator
- VERBS: String[]
- modules: ShapesQuestionGenerator[]
+ ShapesQuestionGenerator()
- initializeModules(): void
+ generateQuestions(amount: int, difficultyLevel: Difficulty, isMultiChoice: boolean): Question[]
# getRandomVerb(): String
AlgebraQuestionGenerator
- WORD_STARTERS: String[]
+ AlgebraQuestionGenerator()
+ generateQuestions(amount: int, difficultyLevel: Difficulty, isMultiChoice: boolean): Question[]
- generateQuestion(difficultyLevel: Difficulty, isMultiChoice: boolean): Question
- solveAnswer(bracket1: Bracket, bracket2: Bracket) : String
- createMultipleChoices(bracket1: Bracket, bracket2: Bracket): String[]
- answerToString(variable: char, b: int, c: int) : String
- getRandomStarter(): String
- generateBracketPair(): Bracket[]
RectangleQuestionGenerator
+ RectangleQuestionGenerator()
+ generateQuestions(amount: int, difficultyLevel: Difficulty, isMultiChoice: boolean): Question[]
- generateQuestion(difficulty: Difficulty, isMultiChoice: boolean): Question
- createMultiChoiceAnswers(side: Side, units: Units, metrics: Metrics): String[]
- drawRectangle(units: Units, side: Side): Image
- createQuestionString(metrics: Metrics): String
- solveQuestion(side: Side, metrics: Metrics, units: Units): String
- getSides(difficultyLevel: Difficulty): Side
TriangleQuestionGenerator
+ TriangleQuestionGenerator()
+ generateQuestions(amount : int, difficultyLevel : Difficulty, isMultiChoice: boolean): Question[]
- generateQuestion(difficultyLevel: Difficulty, isMultiChoice: boolean): Question
- createMultiChoiceAnswers(side: TriangleSides, units: Units, metrics: Metrics): String[]
- drawTriangle(units: Units, side: TriangleSides): Image
- createQuestionString(metrics: Metrics): String
- solveQuestion(side: TriangleSides, metrics : Metrics, units: Units): String
- getSides(difficultyLevel: Difficulty): TriangleSides



Question

- question: String

- answer: String

- multipleChoices: String[]

- image: Image

- difficulty: Difficulty

- topic: Topic

+ Question()

+ setQuestion(question: String): void

+ getQuestion(): String

+ setAnswer(answer: String): void

+ getAnswer(): String

+ setMultipleChoices(falseAnswers: String[]): void

+ getMultipleChoices(): String[]

+ isMultiChoice(): boolean

+ setImage(image: Image): void

+ getImage(): Image

+ setDifficulty(difficulty: Difficulty): void

+ getDifficulty(): Difficulty

+ setTopic(topic: Topic): void

+ getTopic(): Topic

+ toString(): String

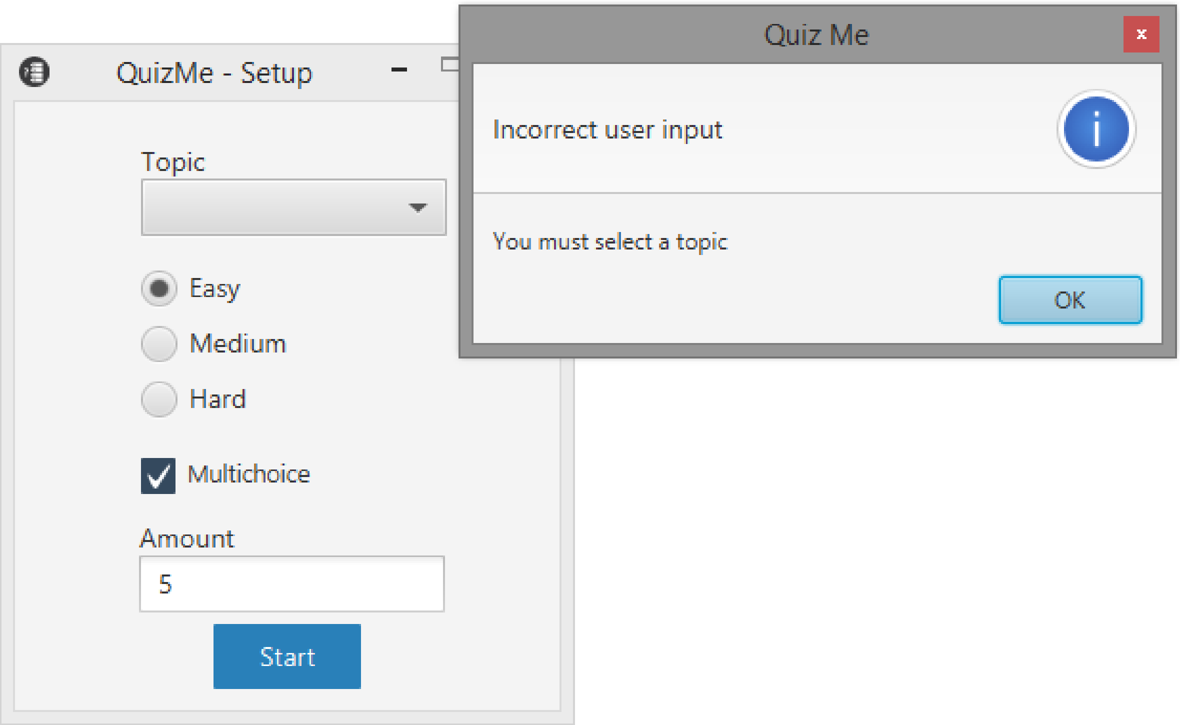
Test plan

Due to the nature of my program, I've decided it's most sensible to do JUnit testing and a test plan. The JUnit is for testing the GUI aspects of the program. Essentially the JUnit testing is the white box tests and the test plan is the black box test.

No.	Description	Data Type	Test data	Expected Result	Comment	Screenshot
1	Not selecting a topic in the setup window then clicking the start button	Erroneous		An error message to show up telling the user to select a topic	Pass	Screenshot 1.0
2	Not selecting a difficulty level in the setup window then clicking the start button	Erroneous		An error message to show up telling the user to select a difficulty level	Pass	Screenshot 2.0
3	Not entering an amount of questions to generate then clicking the start button	Erroneous		An error message to show up telling the user to enter a valid number between 1 – 99	Pass	Screenshot 3.0
4	Entering a non-integer string for the amount of questions to generate then clicking the start button	Erroneous	dfrtvnu three	An error message will show up telling the user to enter a valid number between 1 – 99	Pass	Screenshot 4.0 Screenshot 4.1
5	Enter the number 1 and 99 when choosing the amount of questions to generate then clicking the start button	Boundary	1 99	The program will generate and start the quiz with the number of requested question	Pass	Screenshot 5.0 Screenshot 5.1
6	Enter a number less than 1 and number greater than 99 when choosing the amount of questions to generate then clicking the start button	Erroneous	-5 102	An error message will show up telling the user to enter a valid number between 1 – 99	Pass	Screenshot 6.0 Screenshot 6.1
7	For multiple choice question, leave the fields empty then click next	Erroneous		A alert dialog will pop up to tell the user that they cannot leave the answer blank	Pass	Screenshot 7.0

8	For non-multiple choice question, leave the answer box empty then click next	Erroneous		A alert dialog will pop up to tell the user that they cannot leave the answer blank	Pass	Screenshot 8.0
9	Answer a non-multiple choice question wrongly then click next	Typical	dont know haha	A message box telling the user they got the question wrong. Also, the correct answer will be displayed on an alert dialog	Pass	Screenshot 9.0
10	Answer a non-multiple question correctly then click next	Typical	$y^2 - 12y - 28$	The program will display a spinning tick followed by a short sound clip being played to indicate they got the answer correct	Pass	Screenshot 10.0
11	Answer a multiple choice question wrongly		26cm^2	A message box telling the user they got the question wrong. Also, the correct answer will be displayed on an alert dialog	Pass	Screenshot 11.0
12	Answer a multiple choice question correctly		34cm	The program will display a spinning tick followed by a short sound clip being played to indicate they got the answer correct	Pass	Screenshot 12.0
13	Complete a quiz	Typical		The program will calculate the user’s score and percentage then display it on an alert dialog. Once the alert dialog is exited off, the window will blur to indicate the quiz is finished.	Pass	Screenshot 13.0 Screenshot 13.1

Screenshots



Topic

○ Easy ●
○ Medium
○ Hard

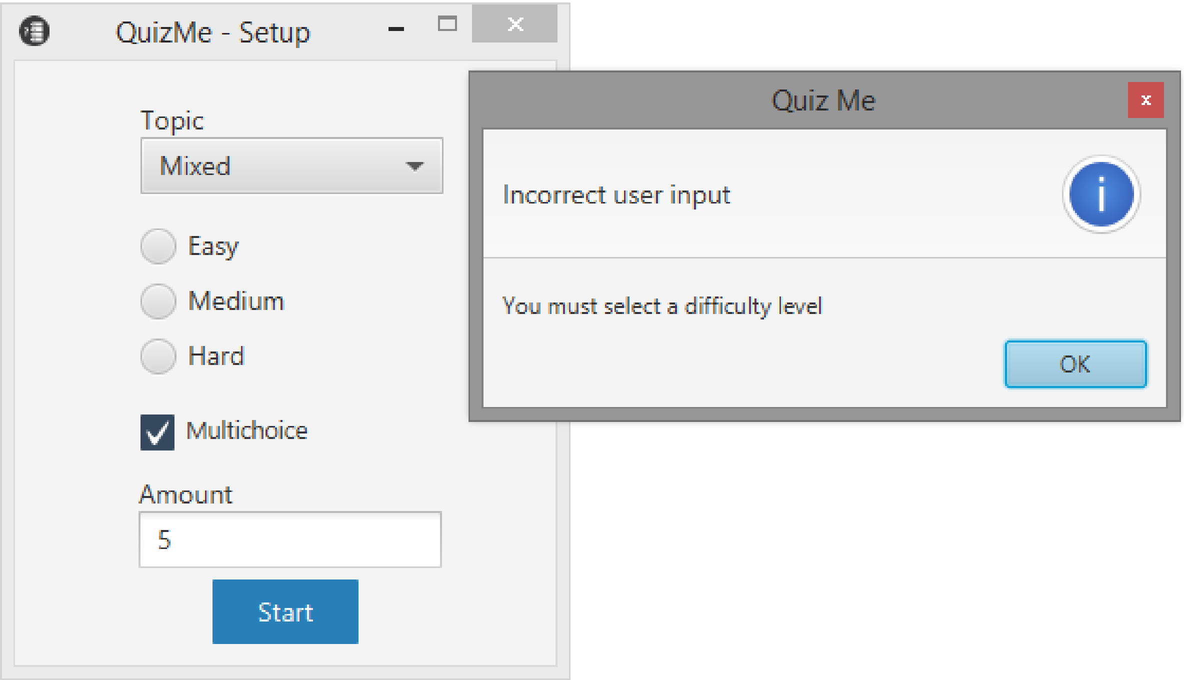
☑ Multichoice

Amount: 5

Incorrect user input

You must select a topic

Screenshot 1.0



Topic: Mixed

○ Easy
○ Medium
○ Hard

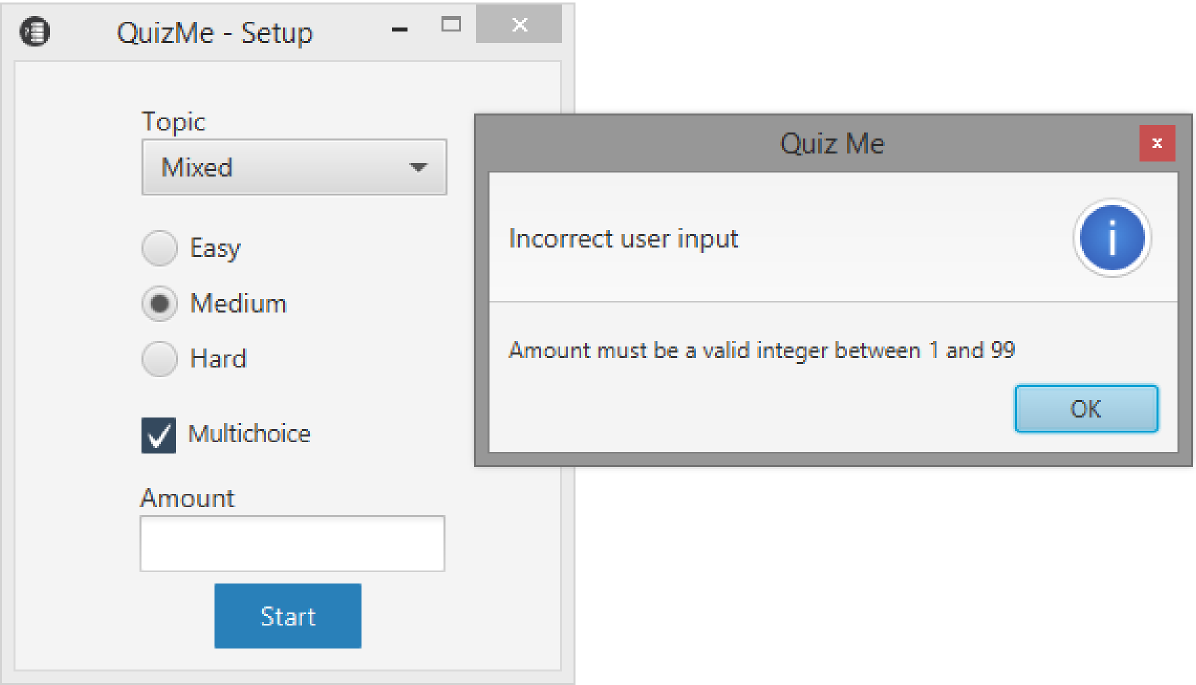
☑ Multichoice

Amount: 5

Incorrect user input

You must select a difficulty level

Screenshot 2.0



Topic
Mixed

○ Easy
● Medium
○ Hard

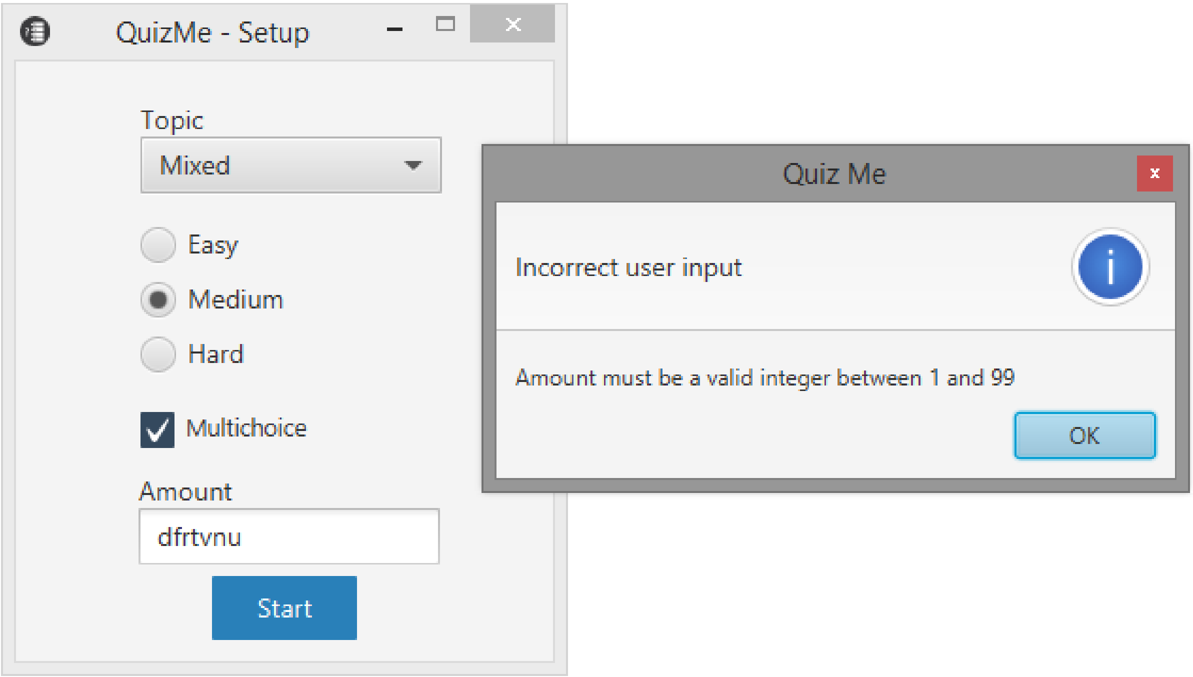
☑ Multichoice

Amount

Incorrect user input

Amount must be a valid integer between 1 and 99

Screenshot 3.0



Topic
Mixed

○ Easy
● Medium
○ Hard

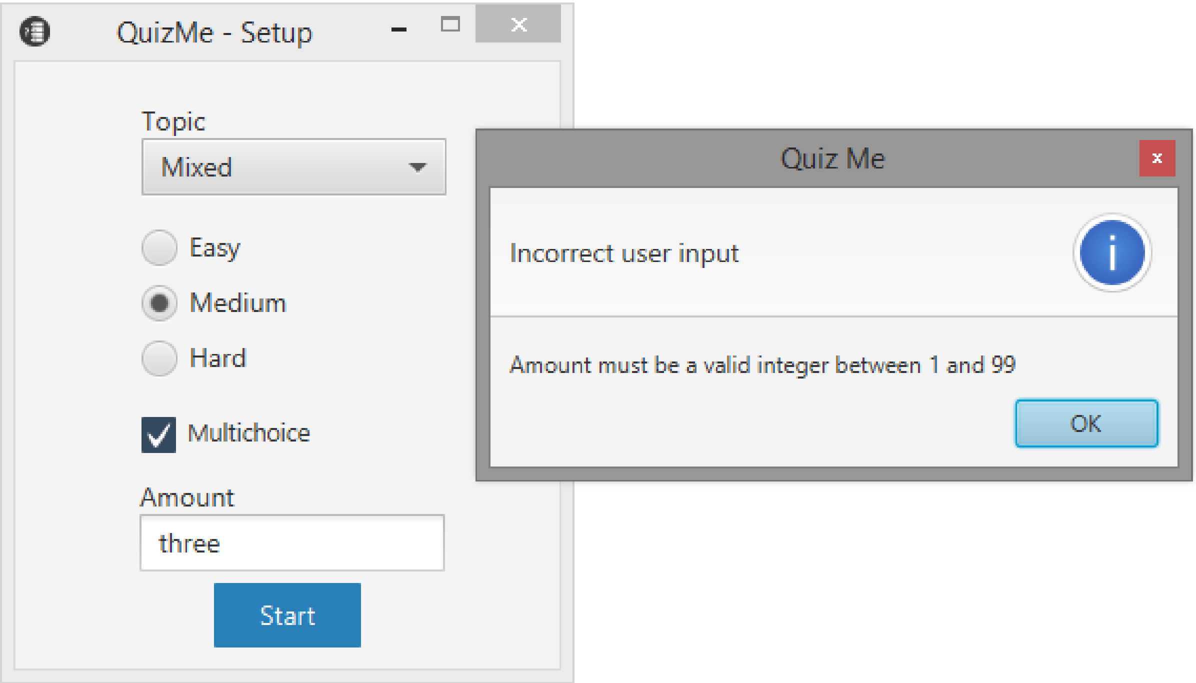
☑ Multichoice

Amount
dfrtvnu

Incorrect user input

Amount must be a valid integer between 1 and 99

Screenshot 4.0



QuizMe - Setup

Topic

Mixed

○ Easy

● Medium

○ Hard

☑ Multichoice

Amount

three

Start

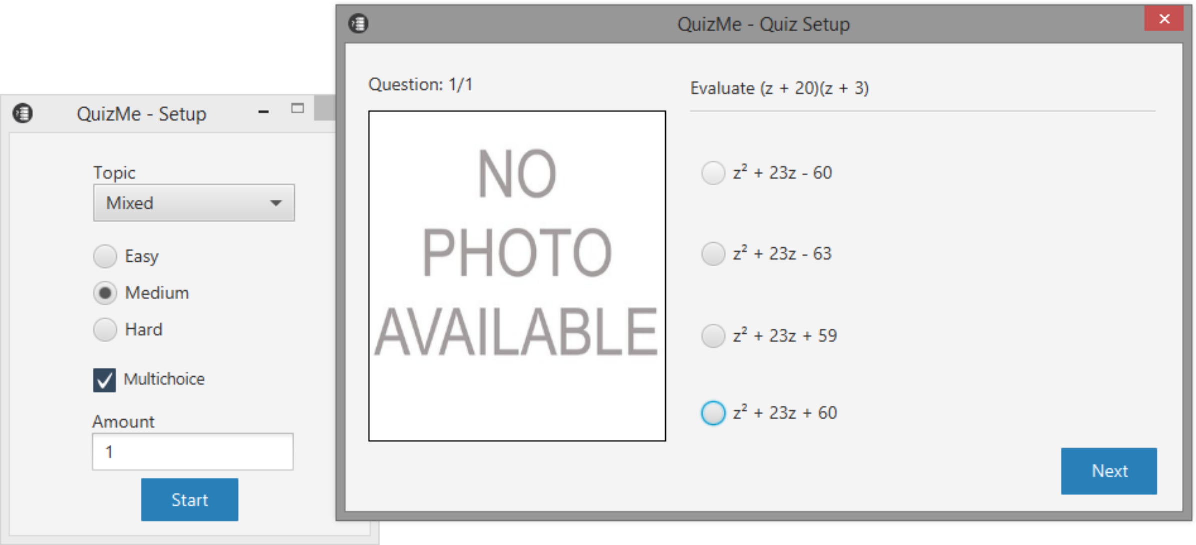
Quiz Me

Incorrect user input

Amount must be a valid integer between 1 and 99

OK

Screenshot 4.1



QuizMe - Setup

Topic

Mixed

○ Easy

● Medium

○ Hard

☑ Multichoice

Amount

1

Start

QuizMe - Quiz Setup

Question: 1/1

NO PHOTO AVAILABLE

Evaluate (z + 20)(z + 3)

○ $z^2 + 23z - 60$

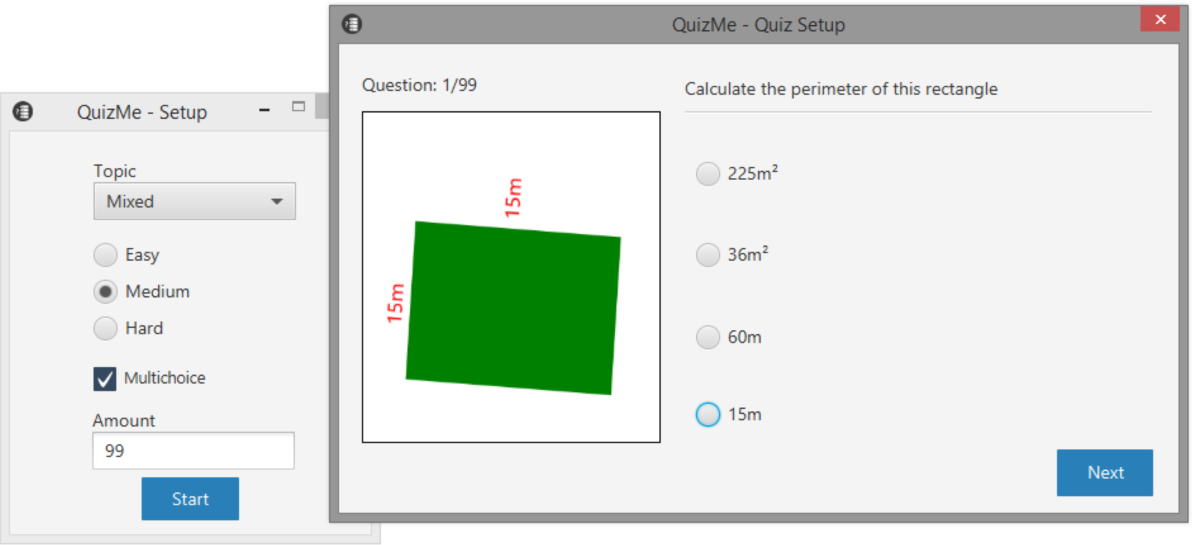
○ $z^2 + 23z - 63$

○ $z^2 + 23z + 59$

○ $z^2 + 23z + 60$

Next

Screenshot 5.0



QuizMe - Setup

Topic

Mixed

○ Easy

● Medium

○ Hard

☑ Multichoice

Amount

99

QuizMe - Quiz Setup

Question: 1/99

Calculate the perimeter of this rectangle

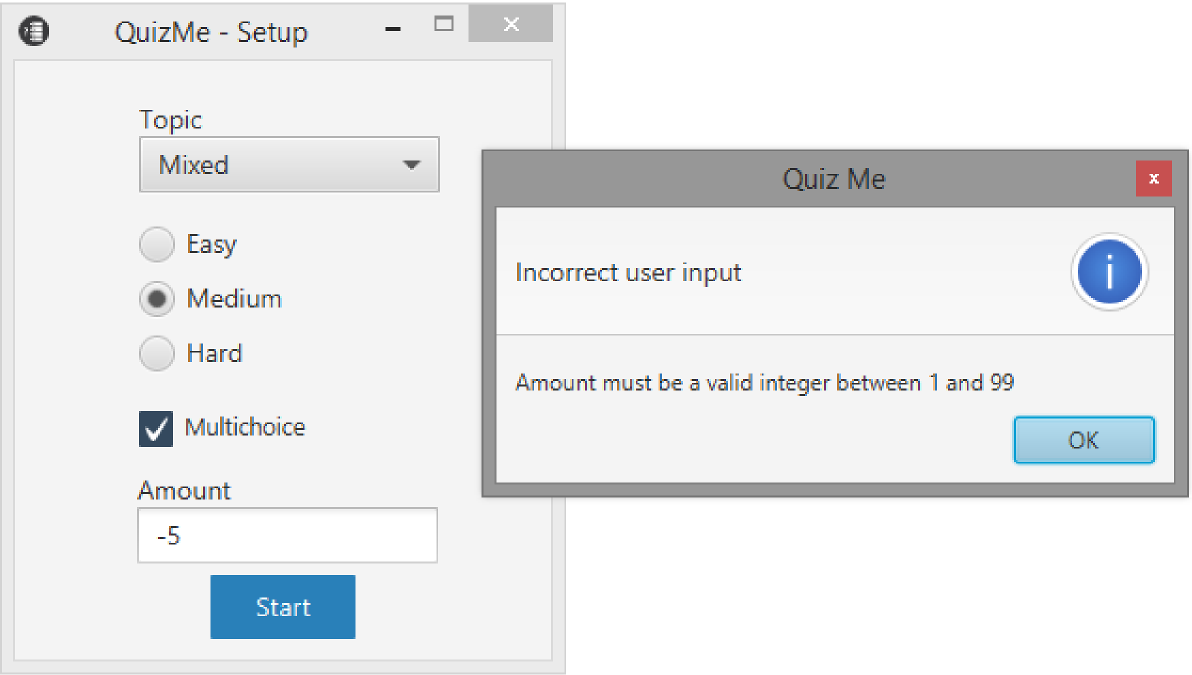
○ 225m^2

○ 36m^2

○ 60m

○ 15m

Screenshot 5.1



QuizMe - Setup

Topic

Mixed

○ Easy

● Medium

○ Hard

☑ Multichoice

Amount

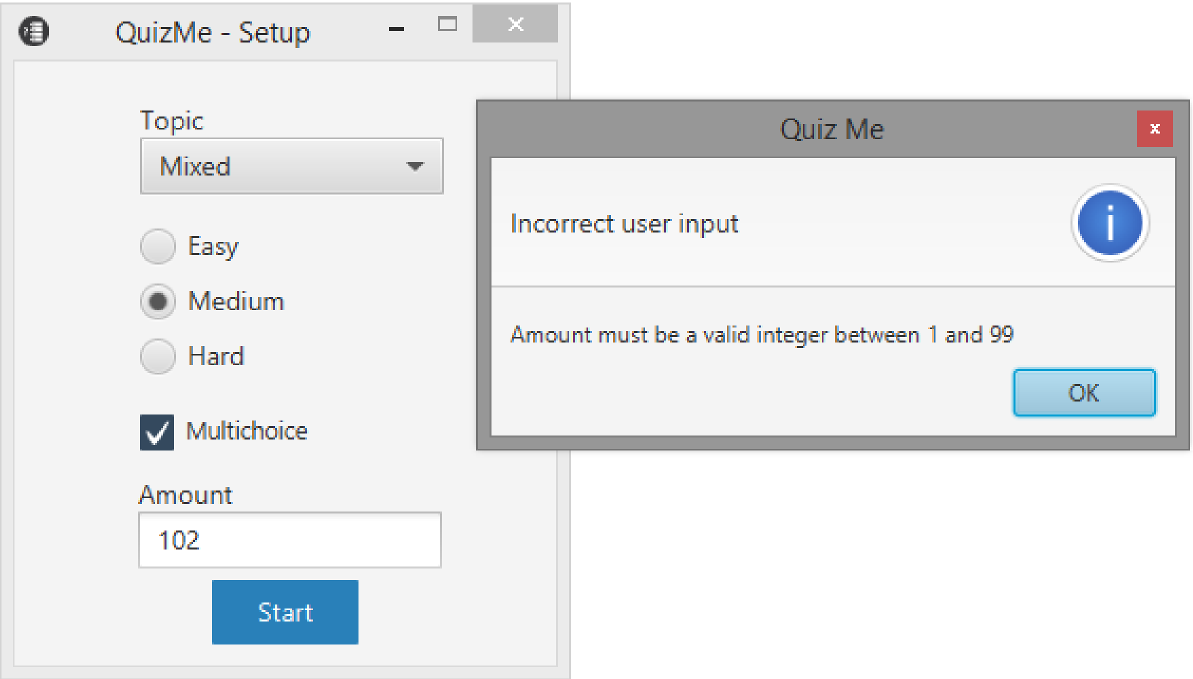
-5

Quiz Me

Incorrect user input

Amount must be a valid integer between 1 and 99

Screenshot 6.0



QuizMe - Setup

Topic

Mixed

○ Easy

● Medium

○ Hard

☑ Multichoice

Amount

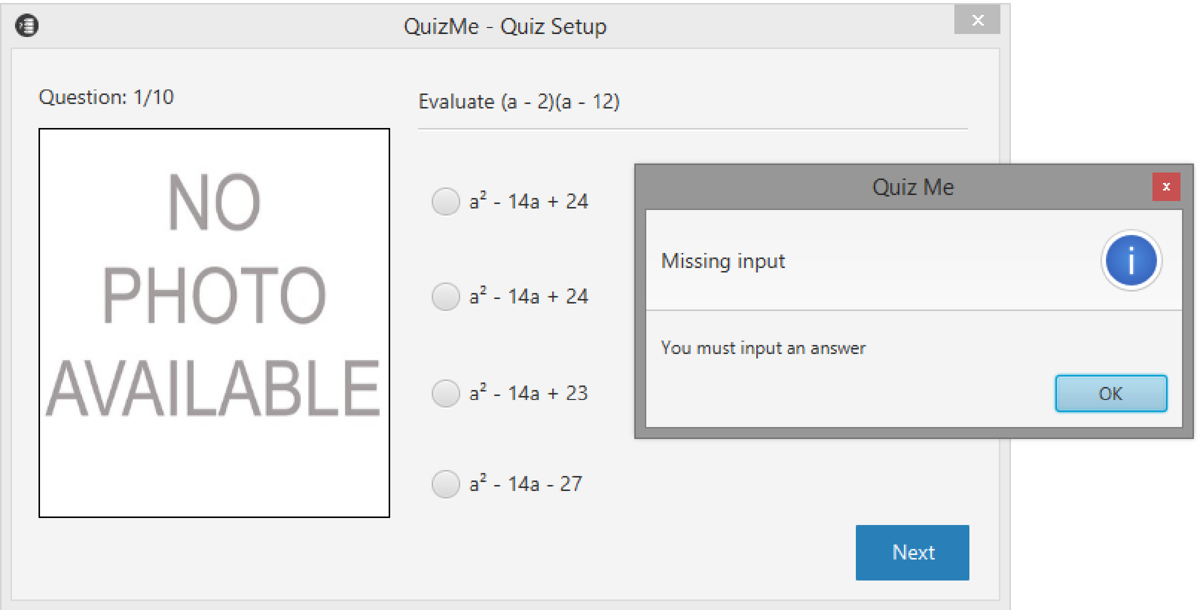
102

Quiz Me

Incorrect user input

Amount must be a valid integer between 1 and 99

Screenshot 6.1



QuizMe - Quiz Setup

Question: 1/10

Evaluate (a - 2)(a - 12)

○ $a^2 - 14a + 24$

○ $a^2 - 14a + 24$

○ $a^2 - 14a + 23$

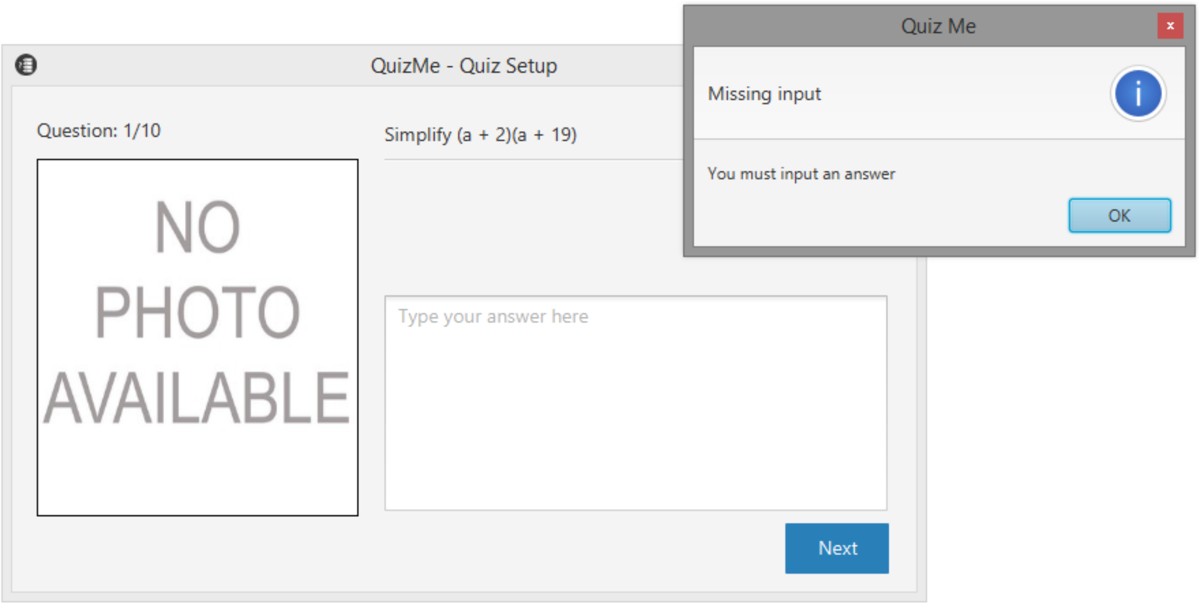
○ $a^2 - 14a - 27$

Quiz Me

Missing input

You must input an answer

Screenshot 7.0



QuizMe - Quiz Setup

Question: 1/10

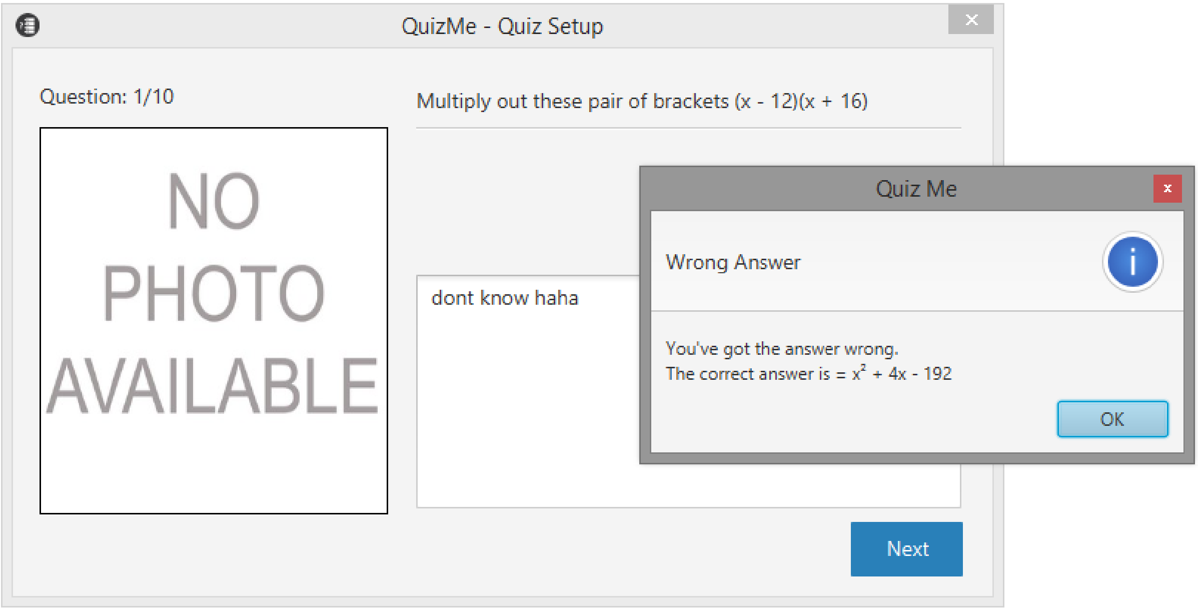
Simplify (a + 2)(a + 19)

Quiz Me

Missing input

You must input an answer

Screenshot 8.0



QuizMe - Quiz Setup

Question: 1/10

Multiply out these pair of brackets (x - 12)(x + 16)

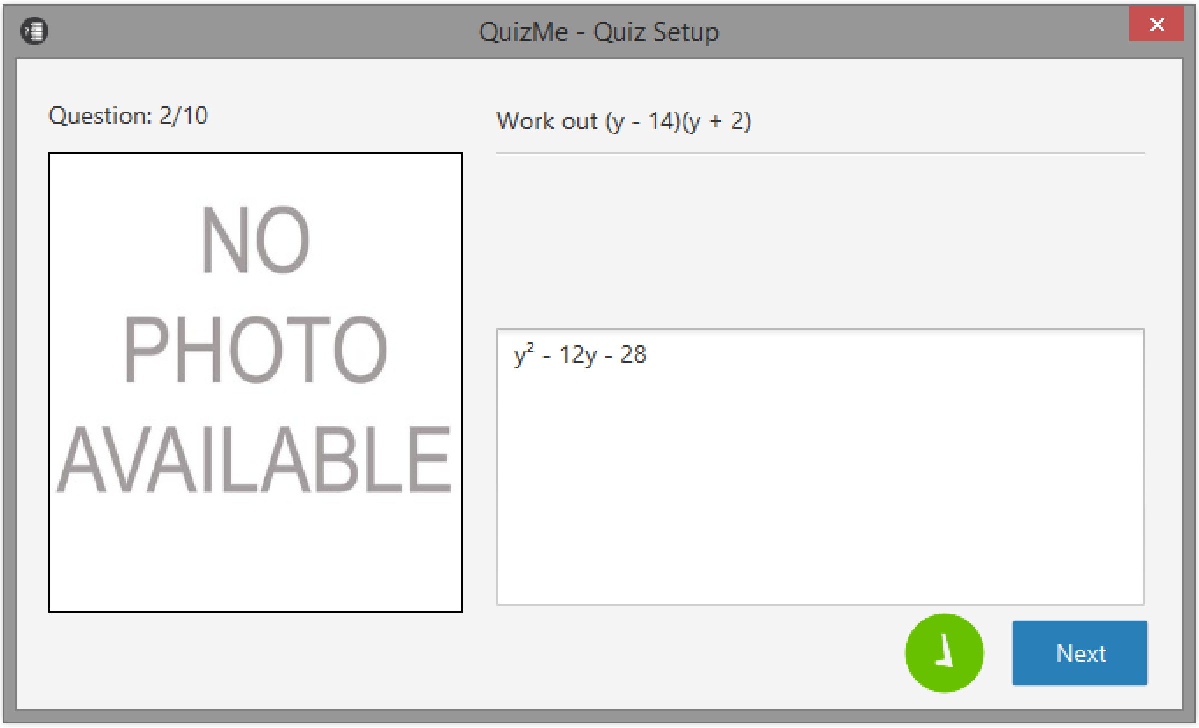
dont know haha

Quiz Me

Wrong Answer

You've got the answer wrong.
The correct answer is = x^2 + 4x - 192

Screenshot 9.0

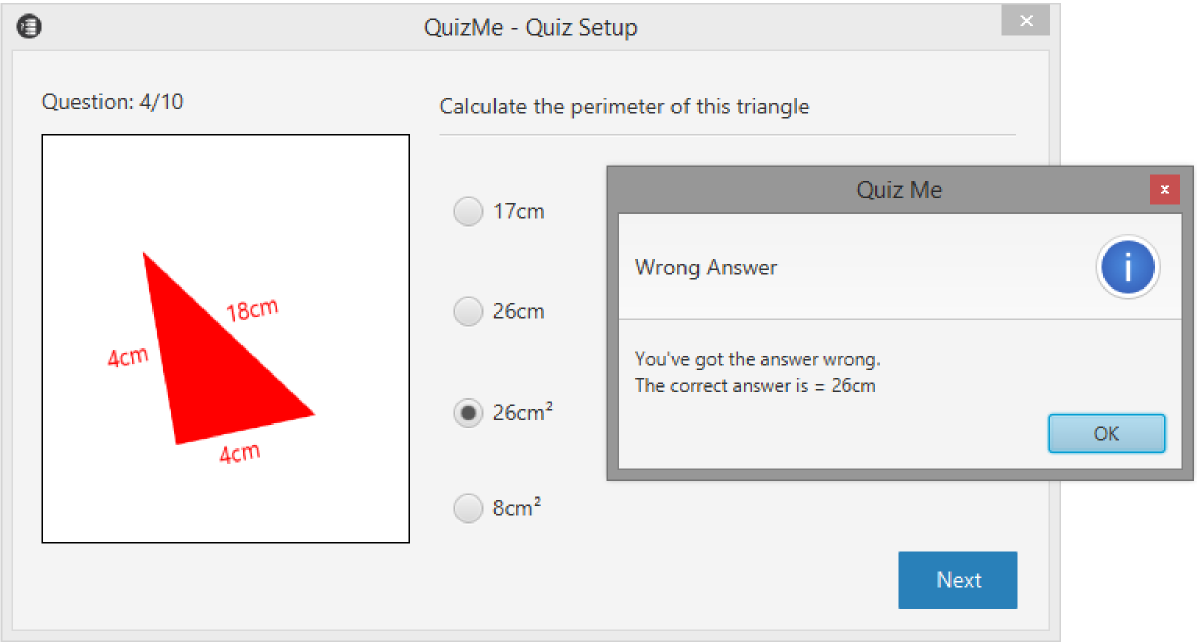


Question: 2/10

Work out (y - 14)(y + 2)

y^2 - 12y - 28

Screenshot 10.0



Question: 4/10

Calculate the perimeter of this triangle

○ 17cm

○ 26cm

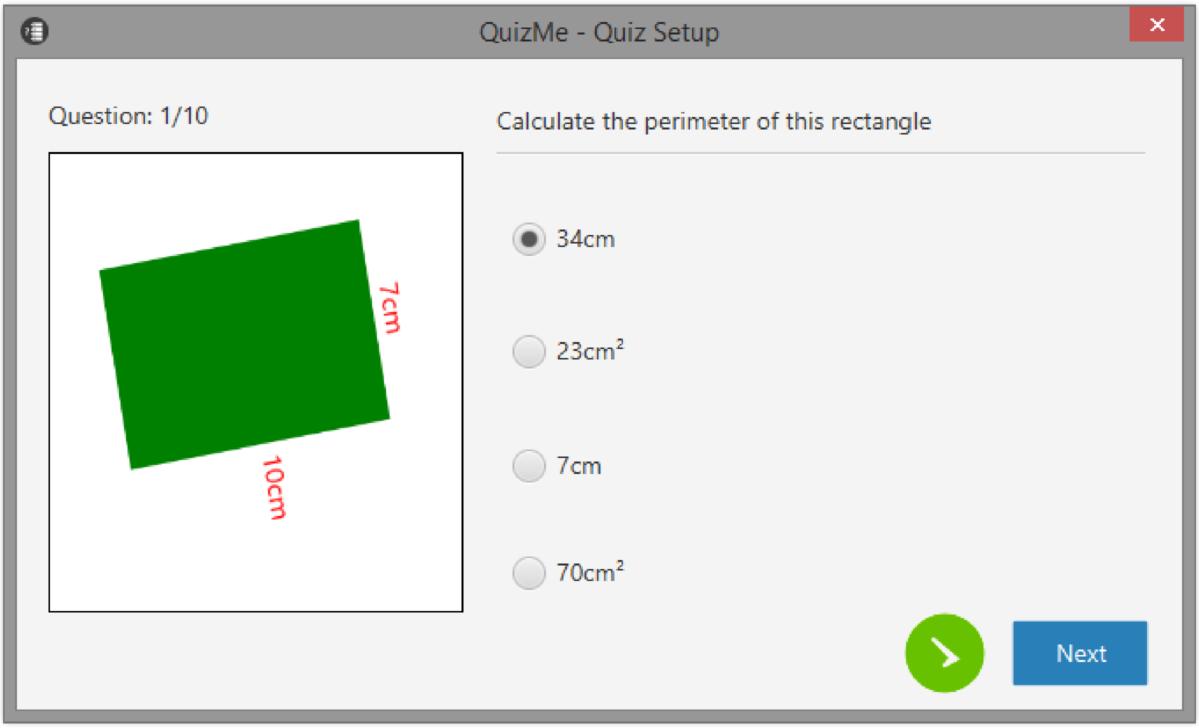
● 26cm^2

○ 8cm^2

Wrong Answer

You've got the answer wrong.
The correct answer is = 26cm

Screenshot 11.0



Question: 1/10

Calculate the perimeter of this rectangle

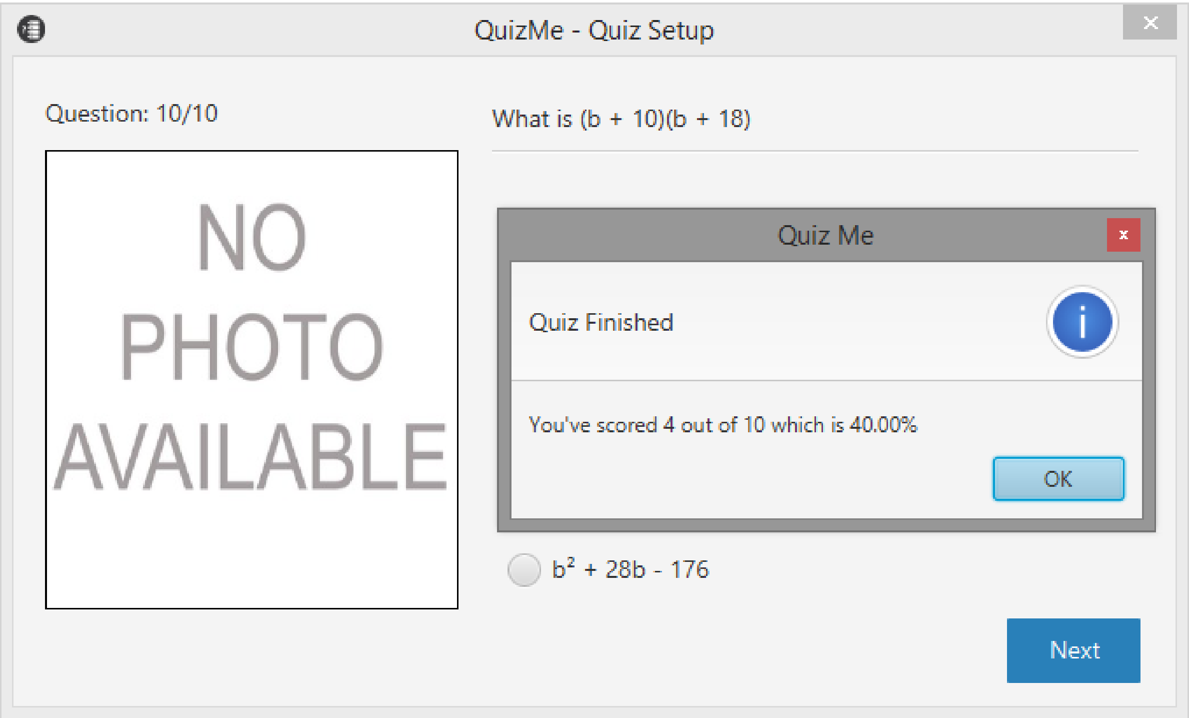
● 34cm

○ $23cm^2$

○ 7cm

○ $70cm^2$

Screenshot 12.0



Question: 10/10

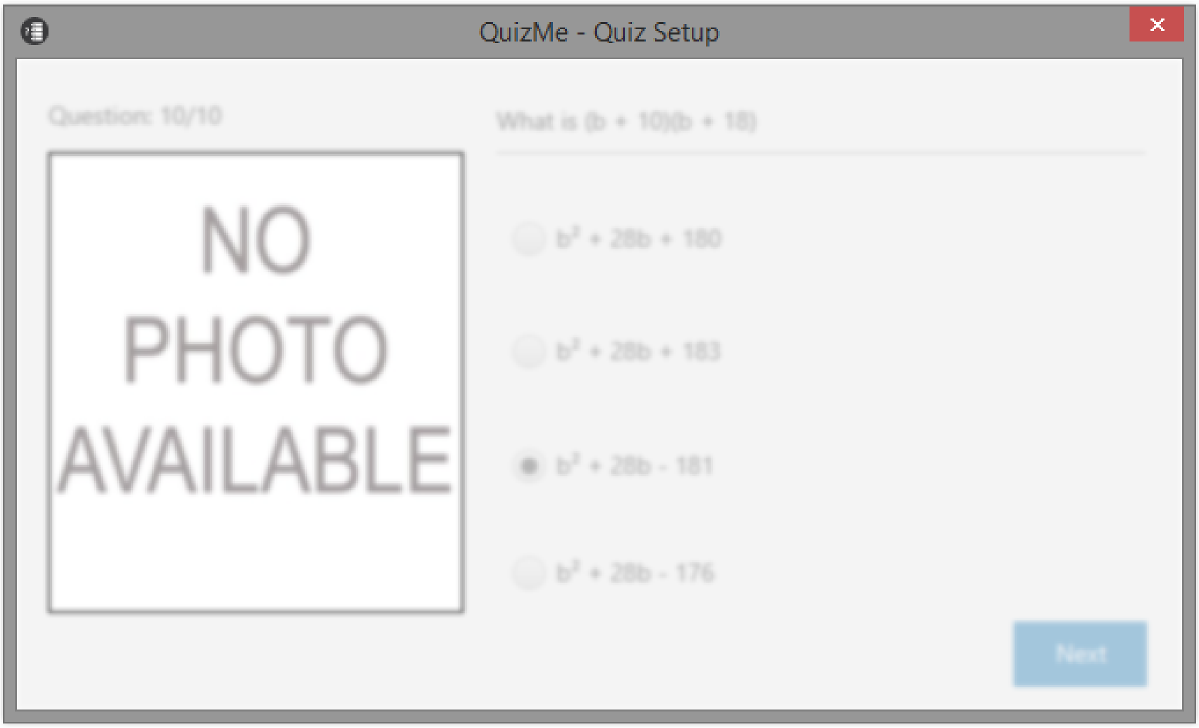
What is (b + 10)(b + 18)

Quiz Finished

You've scored 4 out of 10 which is 40.00%

○ $b^2 + 28b - 176$

Screenshot 13.0



Question: 10/10

What is (b + 10)(b + 18)

○ $b^2 + 28b + 180$

○ $b^2 + 28b + 183$

● $b^2 + 28b - 181$

○ $b^2 + 28b - 176$

Screenshot 13.1