

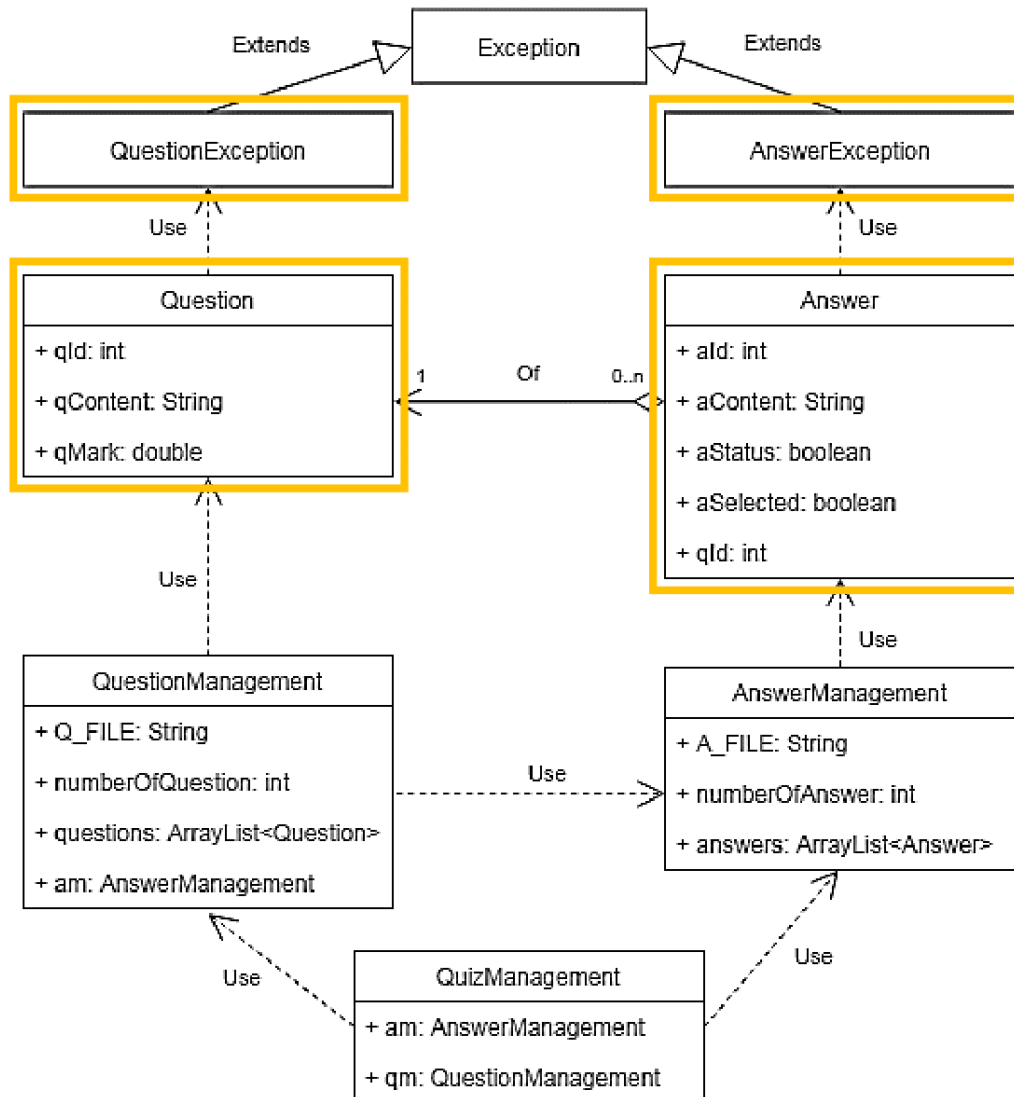
Session 07

Package and Exception Handling

A. STEPS BY STEPS

I. Problem definition

Multiple choice testing is an effective way to get students' level. Your task is to build a simple testing system as below:



Special requirements:

- The data of questions and answers must be **saved** after each run and **reloaded** at the next run **automatically**.
- User can add new question and answer, view question bank and testing.
- Questions and answers of quiz can be **shuffled**.

In this session, you will create the first part of **QuizManagement** Project includes:

- **AnswerException**
- **QuestionException**
- **Answer**
- **Question**

QuestionException.java

```
package quizmanagement;

/**
 *
 * @author KhanhVH@fe.edu.vn
 */
public class QuestionException extends Exception {
    /**
     * Creates new QuesitonException
     * @param message
     */
    public QuestionException(String message) {
        super(message);
    }

    /**
     * Gets the exception message
     * @return
     */
    @Override
    public String getMessage() {
        return "QuestionException: " + super.getMessage();
    }
}
```

Question.java

```
package quizmanagement;

/**
 *
 * @author KhanhVH@fe.edu.vn
 */
public class Question {
    private int    qId;        //Question Id
    private double qMark;     //Question mark
    private String qContent;  //Question content

    /**
     * Sets id for question
     * @param qId question id must be a positive integer
     * @throws QuestionException
     */
    public void setQId(int qId) throws QuestionException {
        if (qId <= 0) {
            throw new QuestionException("Question ID must be a positive integer");
        } else {
            this.qId = qId;
        }
    }

    /**
     * Sets mark for question
     * @param qMark question mark is real number and must be from 0 to 10
     * @throws QuestionException
     */
    public void setQMark(double qMark) throws QuestionException {
        if (qMark < 0 || qMark > 10) {
            throw new QuestionException("Question mark must be from 0 to 10");
        } else {
            this.qMark = qMark;
        }
    }
}
```

```
/**
 * Sets content for question
 * @param qContent question content
 * @throws QuestionException
 */
public void setQContent(String qContent) throws QuestionException {
    if (qContent.equals("")) {
        throw new QuestionException("Question content can't be empty");
    } else {
        this.qContent = qContent;
    }
}

/**
 * Gets the id of question
 * @return
 */
public int getQId() {
    return qId;
}

/**
 * Gets the mark of question
 * @return
 */
public double getQMark() {
    return qMark;
}

/**
 * Gets the content of question
 * @return
 */
public String getQContent() {
    return qContent;
}
```

```
/**
 * Creates new question
 * @param qId
 * @param qMark
 * @param qContent
 * @throws QuestionException
 */
public Question(int qId, double qMark, String qContent) throws QuestionException {
    this.setQId(qId);
    this.setQMark(qMark);
    this.setQContent(qContent);
}

/**
 * Convert the question to string
 * @return
 */
@Override
public String toString() {
    return this.qContent + "\n";
}
}
```

AnswerException.java

```
package quizmanagement;

/**
 *
 * @author KhanhVH@fe.edu.vn
 */
public class AnswerException extends Exception {
    /**
     * Creates new AnswerException
     * @param message
     */
    public AnswerException(String message) {
        super(message);
    }
}
```

```
/**
 * Gets the exception message
 * @return
 */
@Override
public String getMessage() {
    return "AnswerException: " + super.getMessage();
}
```

Answer.java

```
package quizmanagement;

/**
 *
 * @author KhanhVH@fe.edu.vn
 */
public class Answer {
    private int    aId;           //Answer id
    private String aContent;      //Answer content
    private boolean aStatus;      //Answer is correct or not
    private boolean aSelected;    //Answer is selected or not
    private int    qId;           //Question id that answer belongs to

    /**
     * Gets the id of answer
     * @return
     */
    public int getAId() {
        return aId;
    }
}
```

```
/**
 * Sets id for answer
 * @param aId answer id must be a positive integer
 * @throws AnswerException
 */
public void setAId(int aId) throws AnswerException {
    if (aId <= 0) {
        throw new AnswerException("Answer ID must be a positive integer");
    } else {
        this.aId = aId;
    }
}

/**
 * Gets the content of answer
 * @return
 */
public String getAContent() {
    return aContent;
}

/**
 * Sets content for answer
 * @param aContent
 * @throws quizmanagement.AnswerException
 */
public void setAContent(String aContent) throws AnswerException {
    if (aContent.equals("")) {
        throw new AnswerException("Answer content can't be empty");
    } else {
        this.aContent = aContent;
    }
}

/**
 * Checks the answer is true or false
 * @return
 */
public boolean getAStatus() {
    return aStatus;
}
```

```
/**
 * Sets status for answer
 * @param aStatus
 */
public void setAStatus(boolean aStatus) {
    this.aStatus = aStatus;
}

/**
 * Checks the answer is selected or not
 * @return
 */
public boolean isASelected() {
    return aSelected;
}

/**
 * Selects or un-selects answer
 * @param aSelected
 */
public void setASelected(boolean aSelected) {
    this.aSelected = aSelected;
}

/**
 * Gets question id that answer is belongs to
 * @return
 */
public int getQId() {
    return qId;
}

/**
 * Sets id for question
 * @param qId question id must be a positive integer
 * @throws quizmanagement.AnswerException
 */
public void setQId(int qId) throws AnswerException {
    if (qId <= 0) {
        throw new AnswerException("Question ID must be a positive integer");
    } else {
        this.qId = qId;
    }
}
```



```
/**
 * Creates new answer
 * @param aId
 * @param aContent
 * @param aStatus
 * @param qId
 * @throws AnswerException
 */
public Answer(int aId, String aContent, boolean aStatus, int qId) throws AnswerException {
    this.setAId(aId);
    this.setAContent(aContent);
    this.setAStatus(aStatus);
    this.setASelected(false);
    this.setQId(qId);
}

/**
 * Checks if the user answer is correct or not
 * @return
 */
public boolean isCorrect() {
    return this.aStatus == this.aSelected;
}

@Override
public String toString() {
    return this.aContent + "\n";
}
}
```

Example of runtime

run:

The data file answers.txt is found. Data of answers is loading...Done! [28 answers]

The data file questions.txt is found. Data of questions is loading...Done! [7 questions]

----- QUIZ MANAGEMENT -----

1. Add question.
2. Show question bank.
3. Create quiz.
4. Quit.

Please select a function: 1

----- QUIZ MANAGEMENT [ADD NEW QUESTION] -----

Please enter content of question: What is the HTML element to display an image?

Please enter mark of question: 1

Your question is created!

+++ [ADD ANSWERS FOR QUESTION] +++

... Answer 1 ...

Please enter content of answer 1: <image>

Is this answer True or False? (True/False) False

Do you want to add more answer? (Yes/No) Yes

... Answer 2 ...

Please enter content of answer 2: <picture>

Is this answer True or False? (True/False) False

Do you want to add more answer? (Yes/No) Error: You must type 'Yes' or 'No'!

Do you want to add more answer? (Yes/No) Yes

... Answer 3 ...

Please enter content of answer 3: <pic>

Is this answer True or False? (True/False) fal

Error: You must type 'True' or 'False'!

Is this answer True or False? (True/False) False

Do you want to add more answer? (Yes/No) Yes

... Answer 4 ...

Please enter content of answer 4:

Is this answer True or False? (True/False) True

Do you want to add more answer? (Yes/No) No

----- QUIZ MANAGEMENT -----

1. Add question.

2. Show question bank.
3. Create quiz.
4. Quit.

Please select a function: 2

----- QUIZ MANAGEMENT [QUESTION BANK] (8 questions) -----

1. Which of the following is an example of web browser?
 - a. Google
 - b. Bing
 - c. Baidu
 - d. Opera
2. Which of the following HTML tag is used to link the URL?
 - a. <style>
 - b. <link>
 - c. <a>
 - d. <hyperlink>
3. Link URL in HTML is specified using _____ attribute
 - a. src

b. link

c. rel

d. href

4. HTML is considered as

a. High Level Language

b. OOP Language

c. Programming Language

d. Markup Language

5. _____ attribute is used to specify where to open the linked document

a. target

b. coords

c. rel

d. none of the others

6. Which of the anchor attribute is used to specify the language of the linked document?

a. alang

b. lang

c. hreflang

d. all of the others

7. Which of the following is used to open the document in new window?

- a. `Link`
- b. `Link`
- c. `Link`
- d. `Link`

8. What is the HTML element to display an image?

- a. `<image>`
- b. `<picture>`
- c. `<pic>`
- d. ``

----- QUIZ MANAGEMENT -----

- 1. Add question.
- 2. Show question bank.
- 3. Create quiz.
- 4. Quit.

```
Please select a function: 3

----- QUIZ MANAGEMENT [EXAMINATION] (8 questions) -----

How many question of the test: 3

Do you want to shuffle the test? (True/False) True

+++ The test is generating... Done! +++

#####

#      TESTING      #

#####

1. Which of the following HTML tag is used to link the URL?

a. <style>

b. <a>

c. <hyperlink>

d. <link>

>>> Please select answer: b

+++ Congratulation! Your answer is CORRECT!!!

#####

2. _____ attribute is used to specify where to open the linked document
```

a. target

b. rel

c. coords

d. none of the others

>>> Please select answer: a

+++ Congratulation! Your answer is CORRECT!!!

#####

3. Which of the following is used to open the document in new window?

a. Link

b. Link

c. Link

d. Link

>>> Please select answer: d

+++ Congratulation! Your answer is CORRECT!!!

+++++

You are FINISH!!!

Correct rate is 3/3 (100.00%)

Total mark is 3.00/3.00 (100.00%)

----- QUIZ MANAGEMENT -----

1. Add question.
2. Show question bank.
3. Create quiz.
4. Quit.

Please select a function: 4

Thank for using our software!

See you again!

Answers is saving into data file answers.txt...Done! [32 answers]

Questions is saving into data file questions.txt...Done! [8 questions]

BUILD SUCCESSFUL (total time: 2 minutes 39 seconds)