

Climate Change Quiz

Level 3 - Java



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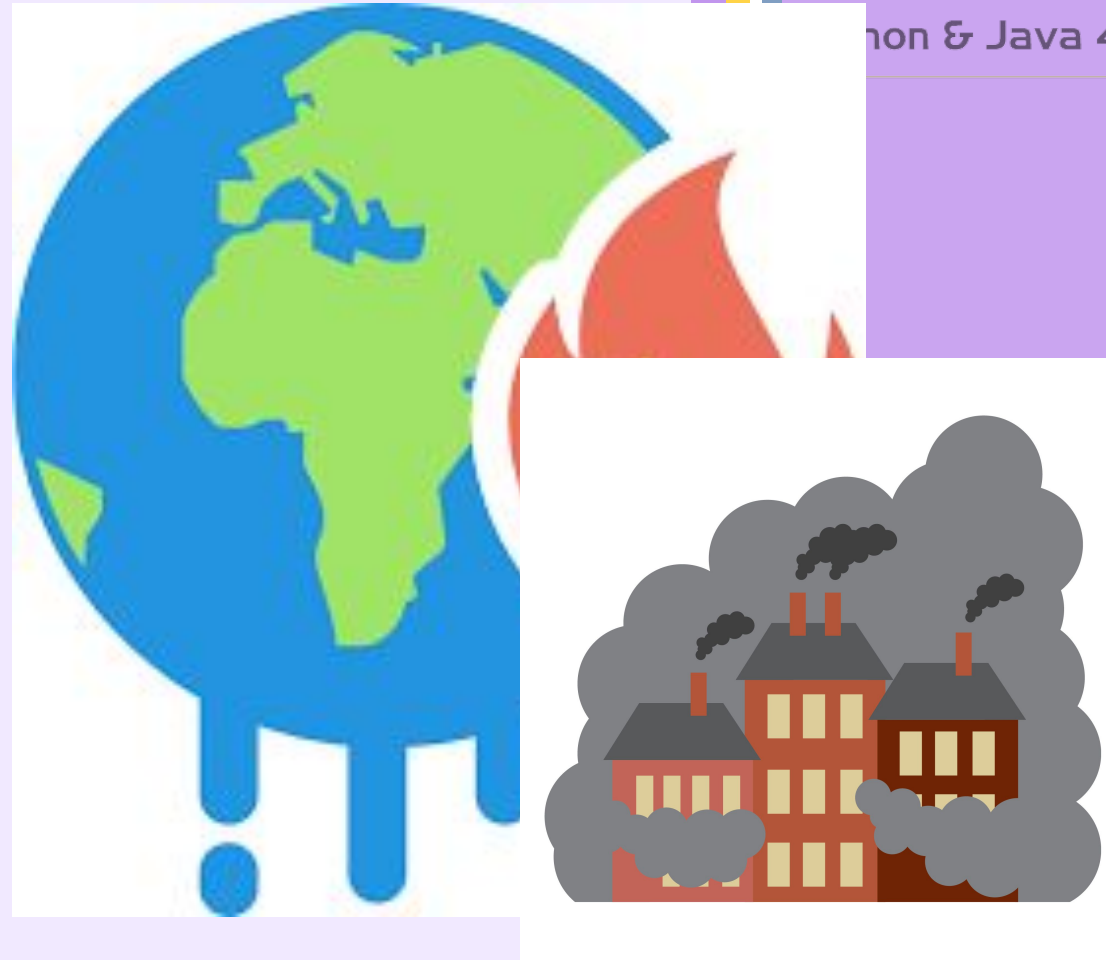
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Introduction

Climate change refers to the long-term changes in global temperatures and other characteristics of the atmosphere. Climate has changed throughout Earth's long history, but this time it's different. Human activity is causing worldwide temperatures to rise higher and faster than any time we know of in the past.

Learning about the causes and effects of climate change can help us raise awareness about the importance of looking after our planet





Task

The UN have asked you to create a program that will help educate people on the importance of climate change.

You have been tasked with making a Climate Change Quiz!

Process

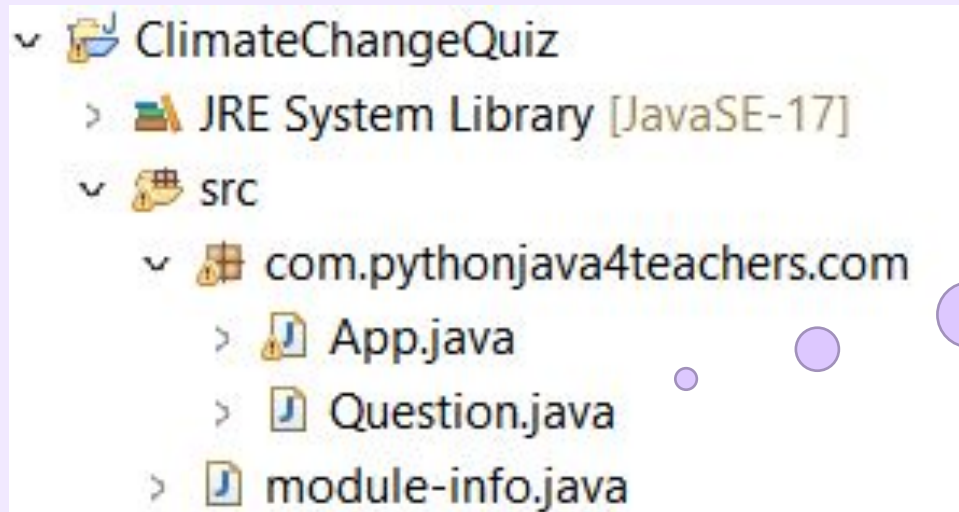
In this project you will be making a climate change quiz. In this project we will:

- Research and gather information about climate change to put in your quiz
- Make a Question class that we can use to model questions
- Allow the user to enter their choice and have their score displayed.

Before You Start...

Create a new Java project. If you are not sure what steps to take, use the [Intro To Java](#) resource.

Have your IDE file system set up in the following way:



This program has two classes! One called 'App.java' and another called 'Question.java'

Note on Errors

Java is slightly more complex than Python - with more complexity, comes more possibility! But also more potential errors.

Hovering over red underlined code often shows a list of possible solutions.

```
import java.awt.BorderLayout;
import java.awt.Color;
import java.awt.Font;
import java.awt.Graphics;
import java.awt.Graphics2D;
import java.awt.Polygon;

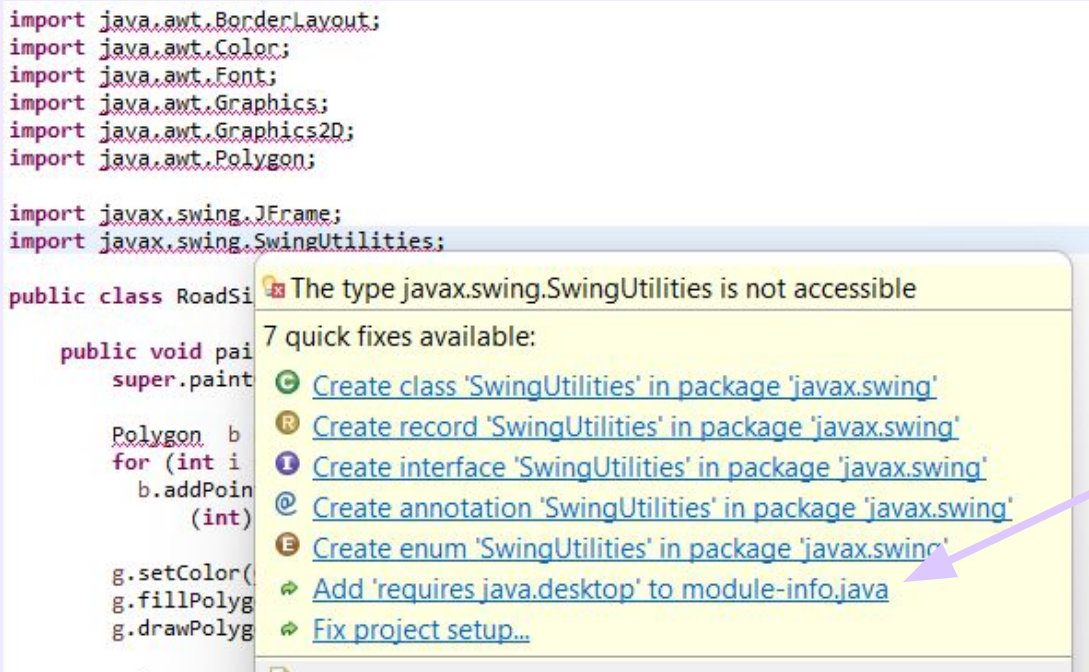
import javax.swing.JFrame;
import javax.swing.SwingUtilities;

public class RoadSi

    public void pai
        super.paint

    Polygon b
    for (int i
        b.addPoin
            (int)

    g.setColor(
    g.fillPolyg
    g.drawPolyg
```



For example, if you get an error such as 'this package is not accessible', hover over your code and select the following.

Classes

Everything in Java is associated with classes and objects, along with its attributes and methods.

```
1 class Car {
2     String make;
3     String model;
4     int year;
5     double mpg;
6     String color;
7
8     void moveForward() {
9     }
10    void moveBackward() {
11    }
12    void stop() {
13    }
14    void turnLeft() {
15    }
16    void turnRight() {
17    }
18    void honk() {
19    }
20 }
```

car behaviors
(methods in Java)

For example: in real life, a car is an object. The car has attributes, such as weight and colour, and methods, such as drive and brake.

A Class is an object constructor, or a “blueprint” for creating objects!

Step 1

Making a blueprint for our questions

We are going to use the Question class as a blueprint for all of the questions in our quiz. Inside the 'Question.java' file, add the following code.

```
public class Question {  
  
    // Class represents a question in our test  
  
    String prompt;  
    String answer;  
  
    public Question(String prompt, String answer) {  
  
        //Accepting input - whatever the user passes in will become  
        // the question and the answer  
        this.prompt = prompt;  
        this.answer = answer;  
  
    }  
  
}
```

The following code will take a question and some answers, and turns it into an object that we can interact with!

We do this by setting up some properties, and initialising them in the class's constructor.

Step 2

Setting up our main program

Inside of our 'App.java' file, we are going to setup the main() method of our program.

```
public class App {  
  
    public static void main(String [] args) {  
  
    }  
}
```

The main() method is the entry point for Java programs (where the program starts running from.)

All Java programs have a main() method!



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Step 3

Writing some questions

A quiz needs questions! For each question, we are going to make a String variable that contains a question and 4 possible answers.

```
public class App {  
  
    public static void main(String [] args) {  
  
        String q1 = "Which of the following is the biggest cause of global warming?\n" +  
                    "(a)Decomposing Plants\n(b)Burning fossil fuels\n(c)Natural variation of the plant\n(d)Pollution from wildfires\n";  
  
        String q2 = "Which of the following places has warmed the most, over the past 100 years?\n" +  
                    "(a)Marrakech, Morocco\n(b)Basra, Iraq\n(c)Vancouver, Canada\n(d)Svalbard, Norway\n";  
  
    }  
}
```

Step 3

Writing some questions

```
String q1 = "Which of the following is the biggest cause of global warming?\n" +  
           "(a)Decomposing Plants\n(b)Burning fossil fuels\n(c)Natural variation of the plant\n(d)Pollution from wildfires\n";  
  
String q2 = "Which of the following places has warmed the most, over the past 100 years?\n" +  
           "(a)Marrakech, Morocco\n(b)Basra, Iraq\n(c)Vancouver, Canada\n(d)Svalbard, Norway\n";
```

The question is laid out by writing the “[Question]\n + [a) Answer 1\n b) Answer 2\n c) Answer 3\n d) Answer 4\n]”

(The \n starts a new line)

Step 4

Creating an array of questions

```
public static void main(String [] args) {  
  
    String q1 = "Which of the following is the biggest cause of global wa  
                "(a)Decomposing Plants\n(b)Burning fossil fuels\n(c)Natur  
  
    String q2 = "Which of the following places has warmed the most, over  
                "(a)Marrakech, Morocco\n(b)Basra, Iraq\n(c)Vancouver, Can  
  
    //Create an array of questions  
    //Question passed in as the first parameter,  
    // correct answer passed in as second  
    Question [] questions = {  
  
        new Question(q1, "b"),  
        new Question(q2, "d")  
  
    };  
};
```

This code adds a new Question into our array. To do this, put the question variable and the “correct answer” into the brackets.

In this step we create an array of questions using our Question() class.

We put them in an array so that we can go through them one-by-one.

Subroutines

Subroutines are sets of instructions designed to perform a frequently used operation within a program.

```
public static void greeting() {  
    System.out.println("Hello World!");  
}
```

Subroutines can store code and will only be run when 'called'.

There are two main types of subroutine: procedures and functions.

Procedures are not required to return a value, whereas functions must return a value.

Subroutines are great ways of writing more maintainable code and leads to more structured, organised and understandable programs.

Step 5

Starting the quiz

```
public static void main(String [] args) {

    String q1 = "Which of the following is the biggest cause of climate change?"
               "(a)Decomposing Plants\n(b)Burning fossil fuels\n(c)Deforestation\n(d)Global warming"

    String q2 = "Which of the following places has warmed the most in the last 100 years?"
               "(a)Marrakech, Morocco\n(b)Basra, Iraq\n(c)Vancouver, Canada\n(d)London, UK"

    //Create an array of questions
    //Question passed in as the first parameter,
    // correct answer passed in as second
    Question [] questions = {

        new Question(q1, "b"),
        new Question(q2, "d")

    };
}

//Method will take an array of questions

public static void takeTest(Question[] questions) {

}
```



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Make a subroutine called `takeTest` that takes our array of questions as a parameter.

Inside this subroutine we will loop through every question, ask the user a question, get their answer and check whether its correct – then update their score accordingly.

Loops

A loop is a sequence of instructions that is continually repeated until a certain condition is reached.

In Java there are two main loops: 'FOR Loops' and 'WHILE Loops'

While Loops are condition controlled and will repeat until their condition is false.

```
int num = 0;
while (num < 5) {
    num ++;
    System.out.println("This loop will repeat 5 times!");
}
```

```
while (true) {
    System.out.println("This is an infinite loop!");
}
```

For loops are count controlled and will repeat a set number of times.

```
for (int i = 0; i<5; i++) {
    System.out.println("This loop will repeat 5 times!");
}
```


Step 6

Starting the quiz

```
//Method will take an array of questions
//
public static void takeTest(Question[] questions) {

    System.out.println("----- Climate Change Quiz -----");

    //Ask the user each individual question
    //If they get it right, increment

    int score = 0;
    Scanner keyboardInput = new Scanner(System.in);

    //Loop through each question using a FOR loop

    for(int i = 0; i < questions.length; i++) {

    }
```

Grace Bennett (G.Bennett16@wghs.org.uk) is signed in

Start by printing out a title for our quiz. Then initialise our score variable and set up a Scanner() object.

The Scanner() object allows us to get input from the user.

We then set up a FOR loop, that will loop through the questions in our array.

Step 7

Question and answer

Inside the FOR loop print out the question by accessing the prompt property of our question object.

```
for(int i = 0; i < questions.length; i++) {  
  
    //Get input from user by using scanner  
    System.out.println(questions[i].prompt);  
  
    String answer = keyboardInput.nextLine();  
  
    if (answer.equals(questions[i].answer)) {  
        score++;  
    }  
  
}
```

Then read in the user's response and save it in the answer variable.

Then use an IF statement to check whether their answer is correct. If it is, we add one to their score using ++.



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Step 8

Display score

At the bottom of your `takeTest()` subroutine, display the user's score!

```
for(int i = 0; i < questions.length; i++) {  
  
    //Get input from user by using scanner  
    System.out.println(questions[i].prompt);  
  
    String answer = keyboardInput.nextLine();  
  
    if (answer.equals(questions[i].answer)) {  
        score++;  
    }  
  
}  
  
System.out.println("-----");  
System.out.println("You got " + score + " out of " + questions.length);
```

Step 9

Call the subroutine

```
public static void main(String [] args) {  
  
    String q1 = "Which of the following is the biggest cause of climate change?  
                "(a)Decomposing Plants\n(b)Burning fossil fuels\n(c)Cutting down trees\n(d)None of the above";  
  
    String q2 = "Which of the following places has warmed the most in the last 50 years?  
                "(a)Marrakech, Morocco\n(b)Basra, Iraq\n(c)London, UK\n(d)None of the above";  
  
    //Create an array of questions  
    //Question passed in as the first parameter,  
    // correct answer passed in as second  
    Question [] questions = {  
  
        new Question(q1, "b"),  
        new Question(q2, "d")  
  
    };  
  
    takeTest(questions);  
  
}
```



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Finally, make sure you call our subroutine in our main() method!



Conclusion

- Learning outcomes:
 - ✓ Learn to use loops in Java
 - ✓ Learn to use classes to make Java objects
 - ✓ Apply programming skills to a real life problem
 - ✓ Create a working and expandable quiz game



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Links to everyday life...

At Play - Helping Others - Environment

Play - Quizzes are fun to play and are an opportunity to learn new things! Can you expand the quiz and test your friends?

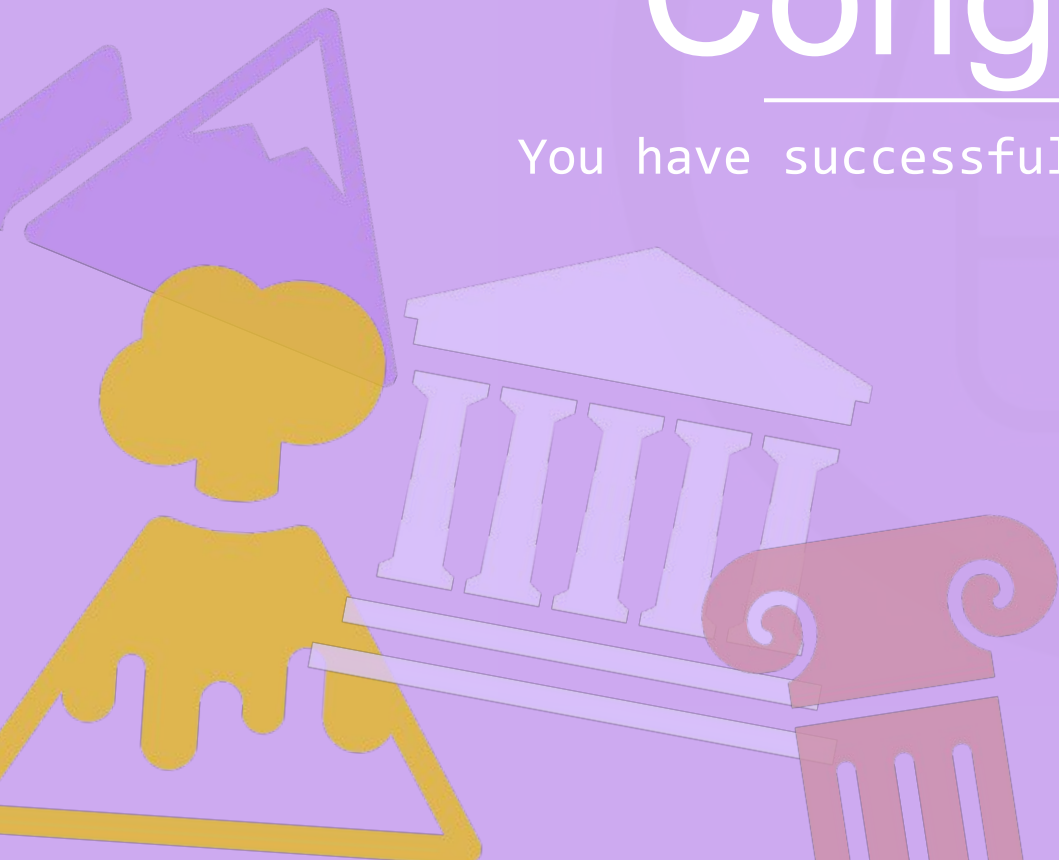
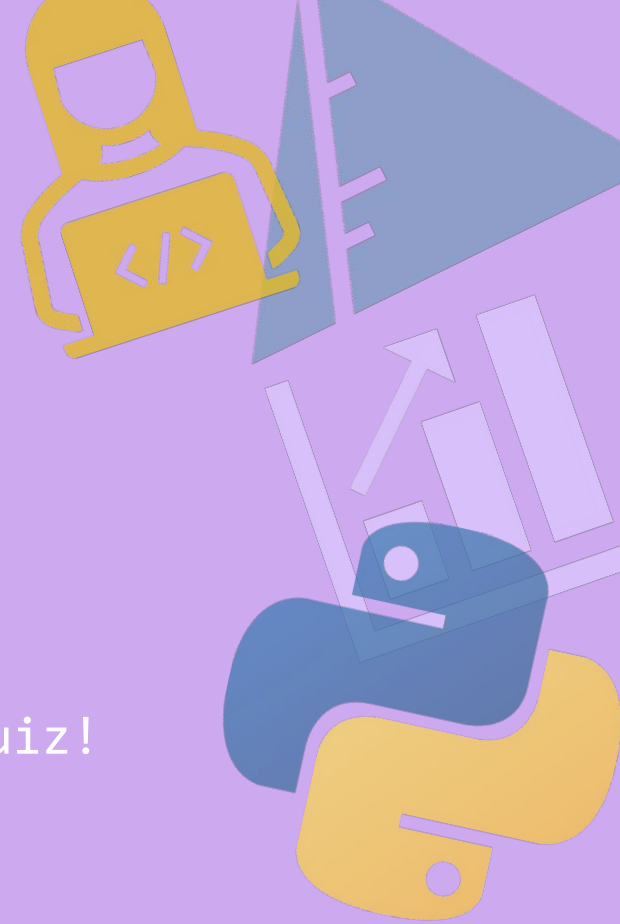
Helping Others - Educating others about the importance of being environmentally aware is crucial in keeping our planet healthy!

Environment - Keeping our planet healthy keeps biodiversity alive and well.



Congratulations!

You have successfully created a climate change quiz!



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