Question 1.1

```
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ1SBakshi> javac .\Ch2ProjectQ1_1SBakshi.java
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ1SBakshi> java Ch2ProjectQ1_1SBakshi
this is a test
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ1SBakshi>
```

Question 1.2

```
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ1SBakshi> java Ch2ProjectQ1_2SBakshi
this is a test
THIS IS A TEST
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ1SBakshi>
```

```
public class Ch2ProjectQ1_2SBakshi
{
	public static void main(String[] args)
	{
		String test = "This is a Test";
		String smallTest = test.toLowerCase();

		System.out.println(smallTest);

		String bigTest = smallTest.toUpperCase();
		System.out.println(bigTest);

		/* The original string did not come back. The new String statement will print
		an all capital statement */
	}
}
```

Question 2.1

```
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ2SBakshi> javac .\Ch2ProjectQ2_1SBakshi.java
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ2SBakshi> java Ch2ProjectQ2_1SBakshi
```

the concat method concatenates the specified string to the end of worked-on string

Question 2.2

```
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ2SBakshi> javac .\Ch2ProjectQ2_2SBakshi.java
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ2SBakshi> java Ch2ProjectQ2_2SBakshi
the quick brown fox jumps over the lazy dog
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ2SBakshi>
```

```
public class Ch2ProjectQ2_2SBakshi
{
	public static void main(String[] args)
	{
		String animal1 = "quick brown fox ";
		String animal2 = "lazy dog";
		String article = "the ";
		String action = "jumps over ";
```

```
		String message =
article.concat(animal1.concat(action.concat(article.concat(animal2))));

		System.out.println(message);
	}
}
```

Question 2.3

```
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ2SBakshi> javac .\Ch2ProjectQ2_3SBakshi.java
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ2SBakshi> java Ch2ProjectQ2_3SBakshi
the quick brown fox jumps over the lazy dog
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ2SBakshi>
```

```
public class Ch2ProjectQ2_3SBakshi
{
	public static void main(String[] args)
	{
		String animal1 = "quick brown fox";
		String animal2 = "lazy dog";
		String article = "the";
		String action = "jumps over";

		String message = article + " " + animal1 + " " + action + " " + article + " " +
animal2;

		System.out.println(message);
	}
}
```

Question 2.4

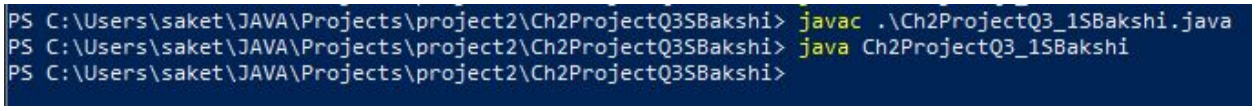
```
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ2SBakshi> javac .\Ch2ProjectQ2_4SBakshi.java
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ2SBakshi> java Ch2ProjectQ2_4SBakshi
abcdefghi
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ2SBakshi>
```

```
public class Ch2ProjectQ2_4SBakshi
{
	public static void main(String[] args)
	{
		String sentence1 = "      abc   ";
		String sentence2 = "   def";
		String sentence3 = "ghi        ";

		String message =
sentence1.trim().concat(sentence2.trim().concat(sentence3.trim()));
```

```
		System.out.println(message);
	}
}
```

Question 3.1

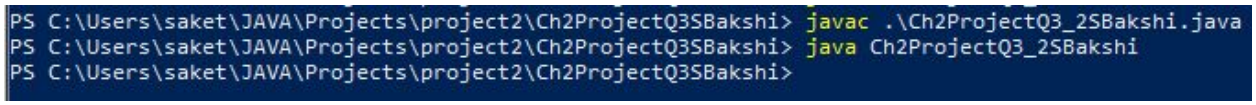
the StringTokenizer class allows an application to break a string into tokens.



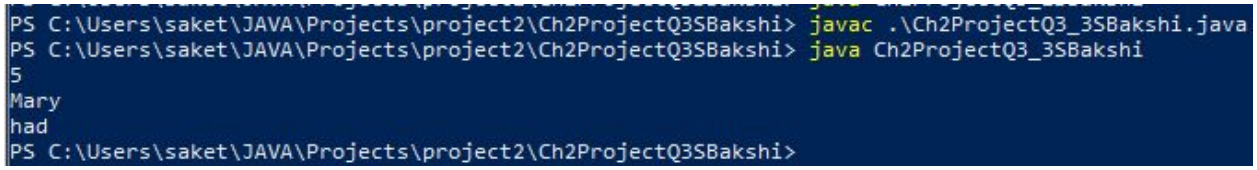
Question 3.2

The countTokens method calculates the number of times that the tokenizer's next method can be called before it generates an exception. Basically, it separates the sentence into separate words and marks each word in order.

The nextToken method returns the next token, or word, from the string tokenizer.



Question 3.3



This program prints the number of words on the first line, the first word on the second line, and the following word on the third line.

Question 4.1

```
import java.awt.Rectangle;

public class Ch2ProjectQ4_1SBakshi
{
	public static void main(String[] args)
	{
		Rectangle r1 = new Rectangle(0, 0, 100, 50);

		Rectangle r2 = new Rectangle(0, 0, 100, 50);

		System.out.println(r1);

		r2.grow(10,20);
		System.out.println(r2);
	}
```

}

Question 4.2

```
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ4SBakshi> javac .\Ch2ProjectQ4_1SBakshi.java
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ4SBakshi> java Ch2ProjectQ4_1SBakshi
java.awt.Rectangle[x=0,y=0,width=100,height=50]
java.awt.Rectangle[x=-10,y=-20,width=120,height=90]
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ4SBakshi>
```

Ch2ProjectQ4_1SBakshi.java

```java
import java.awt.Rectangle;

public class Ch2ProjectQ4_1SBakshi
{
    public static void main(String[] args)
    {
        Rectangle r1 = new Rectangle(0, 0, 100, 50);

        Rectangle r2 = new Rectangle(0, 0, 100, 50);

        System.out.println(r1);

        r2.grow(10,20);
        System.out.println(r2);
    }
}
```

Question 4.3

```java
import java.awt.Rectangle;

public class Ch2ProjectQ4_3SBakshi
{
	public static void main(String[] args)
	{
		Rectangle r1 = new Rectangle(0, 0, 100, 50);

		Rectangle r2 = r1;

		r2.grow(10,20);

		System.out.println(r1);

		System.out.println(r2);
	}
```

}

```
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ4SBakshi> java Ch2ProjectQ4_3SBakshi
java.awt.Rectangle[x=-10,y=-20,width=120,height=90]
java.awt.Rectangle[x=-10,y=-20,width=120,height=90]
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ4SBakshi>
```

The output for both rectangles are identical; both have been mutated by the grow() method. This is because rectangle variables are references to rectangles without any actual rectangle data. Since r2 is set to equal to r1, both r2 and r1 are affected by the grow() method.

Question 4.4

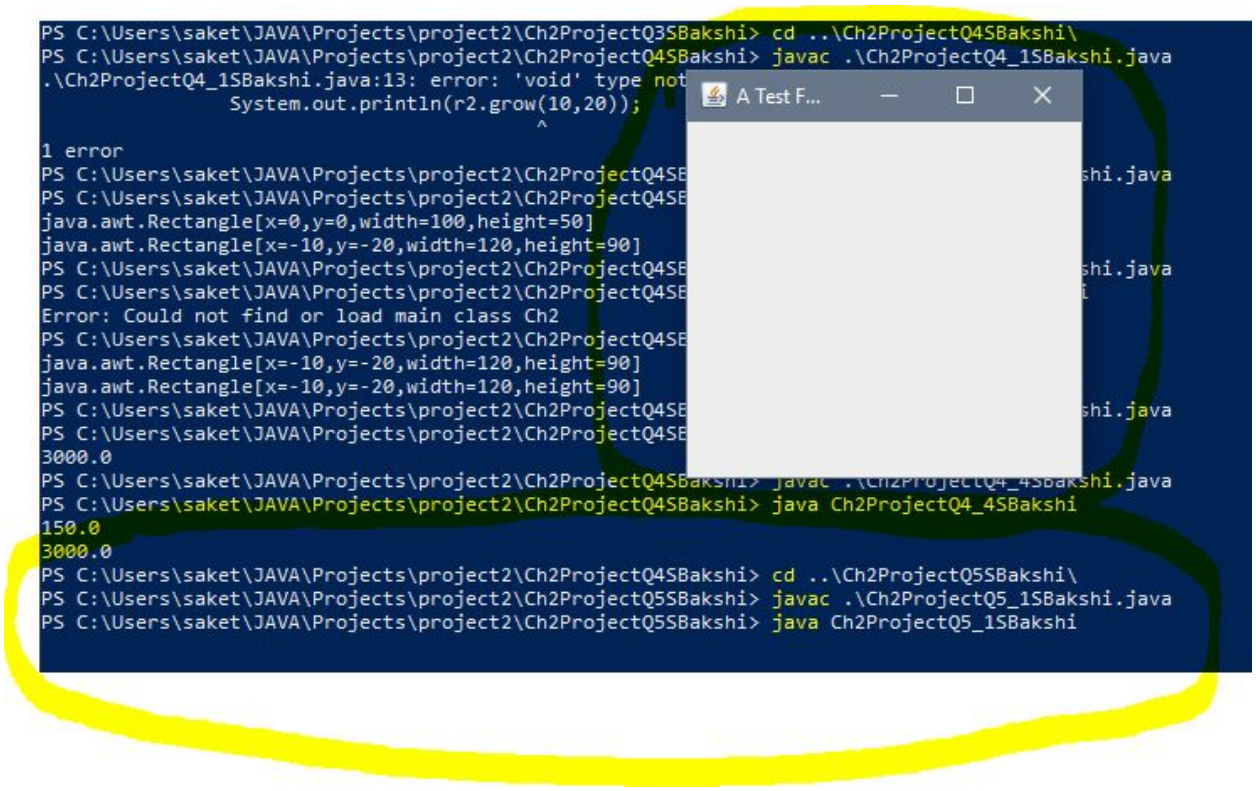
```
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ4SBakshi> javac .\Ch2ProjectQ4_4SBakshi.java
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ4SBakshi> java Ch2ProjectQ4_4SBakshi
150.0
3000.0
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ4SBakshi>
```

The output shows two different values for n1 and n2 because they are number variables that contain actual data instead of reference to double numbers. As a result, when n2 is mutated, it does not change the reference of n1 because n1 is its own entity and not a reference.

Question 5.1

```
import javax.swing.JFrame;

public class TestFrameViewer

{
	public static void main(String[] args)
	{
		JFrame frame = new JFrame();
		final int FRAME_WIDTH = 250;
		final int FRAME_HEIGHT = 250;
		frame.setSize(FRAME_WIDTH, FRAME_HEIGHT);
		frame.setTitle("A Test Frame");
		frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
		frame.setVisible(true);
	}
```

}



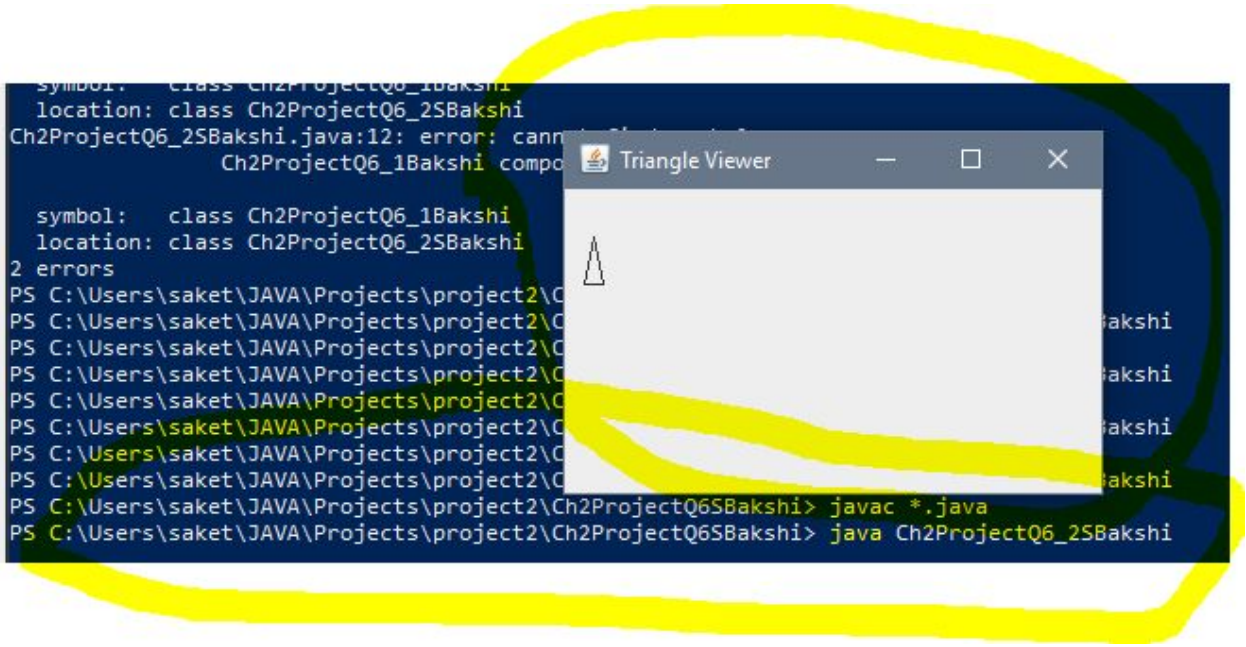
Question 6.1

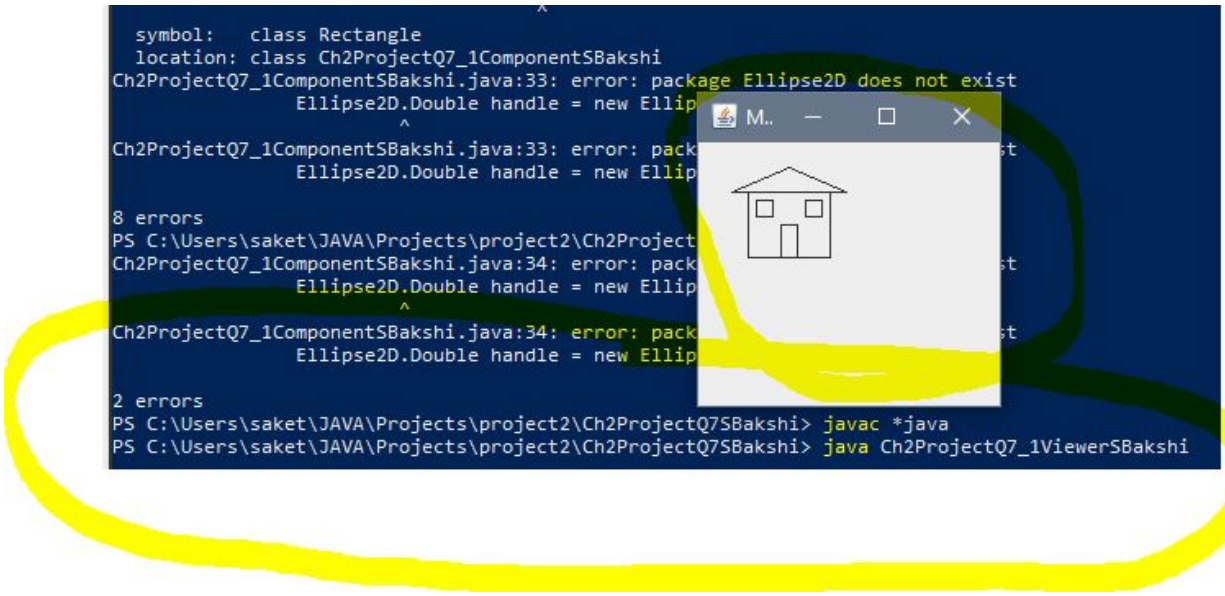
```
import java.awt.Graphics;
import java.awt.Graphics2D;
import java.awt.geom.Line2D;
import javax.swing.JComponent;

public class Ch2ProjectQ6_1SBakshi extends JComponent
{
	public void paintComponent(Graphics g)
	{
		Graphics2D g2 = (Graphics2D) g;

		Line2D.Double line1 = new Line2D.Double(10, 50, 20, 50); // (x1,y1, x2,y2)
		Line2D.Double line2 = new Line2D.Double(10, 50, 15, 25);
		Line2D.Double line3 = new Line2D.Double(15, 25, 20, 50);

		g2.draw(line1);
		g2.draw(line2);
		g2.draw(line3);
	}
```

```
}
```

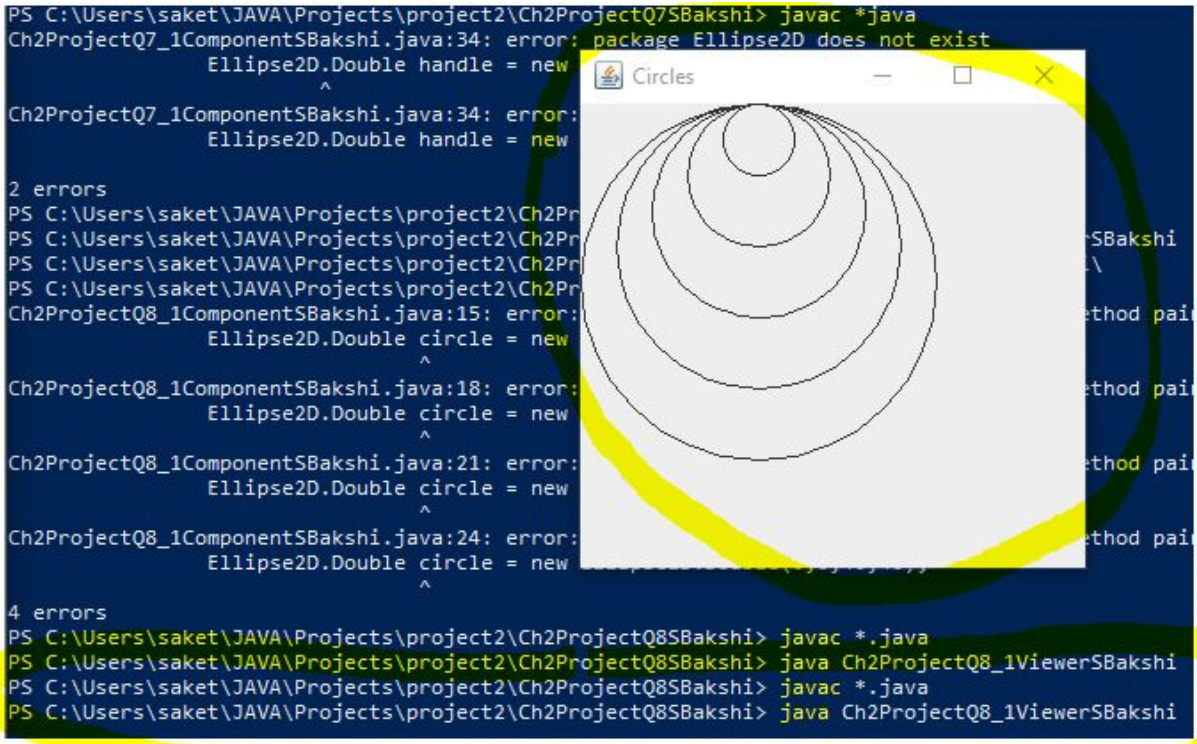
Question 6.2

```
import javax.swing.JFrame;

public class Ch2ProjectQ6_2SBakshi
{
	public static void main(String[] args)
	{
		JFrame frame = new JFrame();
		frame.setSize(300, 200);
		frame.setTitle("Triangle Viewer");
		frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

		Ch2ProjectQ6_1SBakshi component = new Ch2ProjectQ6_1SBakshi();
		frame.add(component);

		frame.setVisible(true);
	}
}
```




symbol: class Rectangle
location: class Ch2ProjectQ7_1ComponentSBakshi
Ch2ProjectQ7_1ComponentSBakshi.java:33: error: package Ellipse2D does not exist
Ellipse2D.Double handle = new Ellip
^
Ch2ProjectQ7_1ComponentSBakshi.java:33: error: pack
Ellipse2D.Double handle = new Ellip
8 errors
PS C:\Users\saket\JAVA\Projects\project2\Ch2Project
Ch2ProjectQ7_1ComponentSBakshi.java:34: error: pack
Ellipse2D.Double handle = new Ellip
^
Ch2ProjectQ7_1ComponentSBakshi.java:34: error: pack
Ellipse2D.Double handle = new Ellip
2 errors
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ7SBakshi> javac *java
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ7SBakshi> java Ch2ProjectQ7_1ViewerSBakshi
M..

Question 8.1


PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ7SBakshi> javac *java
Ch2ProjectQ7_1ComponentSBakshi.java:34: error: package Ellipse2D does not exist
Ellipse2D.Double handle = new
^
Ch2ProjectQ7_1ComponentSBakshi.java:34: error:
Ellipse2D.Double handle = new
2 errors
PS C:\Users\saket\JAVA\Projects\project2\Ch2Pr
PS C:\Users\saket\JAVA\Projects\project2\Ch2Pr
PS C:\Users\saket\JAVA\Projects\project2\Ch2Pr
PS C:\Users\saket\JAVA\Projects\project2\Ch2Pr
Ch2ProjectQ8_1ComponentSBakshi.java:15: error:
Ellipse2D.Double circle = new
^
Ch2ProjectQ8_1ComponentSBakshi.java:18: error:
Ellipse2D.Double circle = new
^
Ch2ProjectQ8_1ComponentSBakshi.java:21: error:
Ellipse2D.Double circle = new
^
Ch2ProjectQ8_1ComponentSBakshi.java:24: error:
Ellipse2D.Double circle = new
^
4 errors
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ8SBakshi> javac *.java
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ8SBakshi> java Ch2ProjectQ8_1ViewerSBakshi
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ8SBakshi> javac *.java
PS C:\Users\saket\JAVA\Projects\project2\Ch2ProjectQ8SBakshi> java Ch2ProjectQ8_1ViewerSBakshi
Circles