public class Sales {
    // calculates sales for 5 products
    public static void main(String args[]) {
        Scanner input = new Scanner(System.in);
        int productNumber;

        double product1 = 0; // amount sold of first product
        double product2 = 0; // amount sold of second product
        double product3 = 0; // amount sold of third product
        double product4 = 0; // amount sold of fourth product
        double product5 = 0; // amount sold of fifth product
        double product1val = 2.98;
        double product2val = 4.50;
        double product3val = 9.98;
        double product4val = 4.49;
        double product5val = 6.87;
        /* Ask the user to enter product number */

        System.out.println("Enter Product Number 1-5 (0 to stop and view summary) :
    ");
        productNumber = input.nextInt();

        /* Create while statement that loops until sentinel is entered */
        while (productNumber != 0){

            /* Determine whether user's product number is in 1-5 */
            if (productNumber >= 1 && productNumber <= 5)

                /* If so, ask user to input the quantity sold */
                /* Write a switch statement here that will compute the total
for that product */
                switch(productNumber)
                {
                    case 5:
                        System.out.print("Enter quantity sold: ");
                        product5+=input.nextDouble();
                        break;
```java
    }  // end switch

    case 4:
        System.out.print("Enter quantity sold: ");
        product4+=input.nextDouble();
        break;
    case 3:
        System.out.print("Enter quantity sold: ");
        product3+=input.nextDouble();
        break;
    case 2:
        System.out.print("Enter quantity sold: ");
        product2+=input.nextDouble();
        break;
    case 1:
        System.out.print("Enter quantity sold: ");
        product1+=input.nextDouble();
        break;
}

    /* If product number is not in 1-5, test if product number is not 0 */
    productNumber = input.nextInt();
    if(productNumber < 0 || productNumber > 5)
        /* Display error message for invalid product number */
        System.out.println("Invalid product number! 
Please enter another product: ");

        /* Ask the user to enter another product number */
        System.out.println("Enter product number (1-5), 0 to stop and view summary: ");
        productNumber = input.nextInt();

    }  // end while loop */

    // print summary
    System.out.println();
    System.out.printf( "Product 1: $%.2f\n", product1 * product1val);
    System.out.printf( "Product 2: $%.2f\n", product2 * product2val);
    System.out.printf( "Product 3: $%.2f\n", product3 * product3val);
    System.out.printf( "Product 4: $%.2f\n", product4 * product4val);
    System.out.printf( "Product 5: $%.2f\n", product5 * product5val);
    /* write code here for the rest of the summary message it should contain the totals for the rest of the products, each on its own line */

    }  // end main
}  // end class body
```
1a. Sales.java Solution

Product 1: $8.94
Product 2: $13.50
Product 3: $0.00
Product 4: $8.98
Product 5: $0.00

2. Triples.Java Code

// Lab 3: Triples.java
// Program calculates Pythagorean triples
public class Triples
{
    public static void main( String args[] )
    {
        // declare the three sides of a triangle
        int side1;
        int side2;
        int hypotenuse;

        /* Write loop for side1 to try the values 1-500. */
        int max=500;
        for (side1 = 1; side1 <= max; side1++)
        {
            /* Write loop for side2 to try the values 1-500. */
            for (side2 = 1; side2 <= max; side2++)
            {
                /* Write loop for hypotenuse to try the values 1-500 */
                for (hypotenuse = 1; hypotenuse <= max; hypotenuse++)
                {
                    /* Write an if statement that determines whether the sum of the two sides squared equals the hypotenuse squared. If this condition is true display side1, side2 and hypotenuse. */
                    if (((side1*side1)+(side2*side2))==((hypotenuse*hypotenuse)))
                    {
                        if(side1 < side2)
                        {
                            System.out.println("s1: " + side1 + " s2: " + side2 + " h: " + hypotenuse);
                        }
                    }
                }
            }
        }
    }
} // end class Triples
2a. Triples.Java Solution

s1: 3 s2: 4 h: 5
s1: 5 s2: 12 h: 13
s1: 6 s2: 8 h: 10
s1: 7 s2: 24 h: 25
s1: 8 s2: 15 h: 17
s1: 9 s2: 12 h: 15
s1: 9 s2: 40 h: 41
s1: 10 s2: 24 h: 26
s1: 11 s2: 60 h: 61
continued to
s1: 340 s2: 357 h: 493


// Lab 3: Multiply.java
// Program generates single digit multiplication problems
import java.util.*;

public class Multiply
{
    Random randomNumbers = new Random();

    int answer; // the correct answer

    // ask the user to answer multiplication problems
    public void quiz()
    {
        Scanner input = new Scanner( System.in );

        int guess; // the user's guess

        /* write code to call method checkResponse to display the question */
        createQuestion();
        System.out.println( "Enter your answer (-1 to exit):" );
        guess = input.nextInt();

        while ( guess != -1 )
        {
            /* write code to call the method to check the user's answer */
            checkResponse( guess);

            System.out.println( "Enter your answer (-1 to exit):" );
            guess = input.nextInt();
        } // end while
    } // end method

    // prints a new question and stores the corresponding answer
    /* write method header for the createQuestion method */
```java
private void createQuestion()
{
    // get two random numbers between 0 and 9
    /* Write code to get two random numbers and store them in variables
digit1 and digit2. */
    int digit1 = randomNumbers.nextInt(9);
    int digit2 = randomNumbers.nextInt(9);

    /* Write code to multiply the two variables and store the result
    in variable answer */
    answer = digit1 * digit2;

    System.out.printf( "How much is %d times %d?\n", digit1, digit2 );
} // end method createQuestion

// checks if the user answered correctly
/* Write method header for checkResponse */
private void checkResponse( double guess )
{
    /* Write code to test whether the answer is incorrect */
    /* Write code to tell the user to try again, if the answer is incorrect */

    if (guess != answer)
    {
        System.out.println("Wrong answer. Please try again.");
    }
    else
    System.out.println("Very Good!");
    {
        /* Write code to call method createQuestion to display another question */
        createQuestion();
    } // end else
} // end method checkResponse
} // end class Multiply

3a. Multiply.java Solution
How much is 3 times 2?
Enter your answer (-1 to exit):
6
Very Good!
How much is 4 times 8?
Enter your answer (-1 to exit):
32
    Very Good!
How much is 4 times 5?
Enter your answer (-1 to exit):
2
Wrong answer. Please try again.
How much is 2 times 0?
Enter your answer (-1 to exit):
```
4. TrianglePrinting.Java

```java
public class TrianglePrinting {
    public static void main(String args[]) {
        int row, col, space;
        System.out.println("(a)");
        // Triangle A Code
        for (row = 1; row <=10; row++) {
            for (col=1; col <= row; col++)
                System.out.print('*');
            System.out.println();
        }
        System.out.println("\n(b)");
        // Triangle B Code
        for (row=10; row >= 1; row--)
            System.out.println();
        System.out.println("\n(c)");
        // Triangle Code
        for (row=10; row >= 1; row--)
            for (space=1; space < row; space++)
                System.out.print(' ');
            for (col = 1; col < row; col++)
                System.out.print('*');
            System.out.println();
        System.out.println("\n(d)");
        // Triangle D Code
        for (row = 10; row >= 1; row--)
            for (space = 1; space < row; space++)
```

System.out.print(' ');
for(col = 10; col >= row; col--);
} System.out.print('*');
System.out.println();
} // end TrianglePrinting class

4. TrianglePrinting Solution:
(a)
*
**
***
****
*****
******
*******
********
*********
**********

(b)
 ********
 ********
 ********
 ********
 ********
 ****
 ***
 **
*

(c)
 ********
 ********
 ********
 ********
 ********
 ****
 ***
 **
*

(d)
*
 **
 ***
 ****
 *****
5. RoundNumbers. Java

```java
import java.util.Scanner;

public class roundingNumbers {
    public static void main (String[] args) {
        double x;

        //Create Scanner to obtain input from user
        Scanner input=new Scanner(System.in);
        {
            System.out.print("Enter a digit with at least four decimal places:");
            x=input.nextDouble();

            //create an output String with appropriate rounding
            System.out.println("The number: "+String.valueOf(x) +
                "\nThis is your number rounded to Integer: "+String.valueOf(roundToInteger(x)) +
                "\nThis is your number rounded to the Tenth: "+String.valueOf(roundToTenths(x)) +
                "\nThis is your number rounded to Hundredth: "+String.valueOf(roundToHundredths(x)));
        }

        public static double roundToInteger(double number) {
            return(Math.floor(number + .5));
        }

        public static double roundToTenths(double number) {
            return(Math.floor(number*10+.5)/10);
        }

        public static double roundToHundredths(double number) {
            return(Math.floor(number*100+.5)/100);
        }

        public static double roundToThousandths(double number) {
```
5. RoundingNumbers.Java Solution

Enter a digit with at least four decimal places: .4321
The number: 0.4321
This is your number rounded to Integer: 0.0
This is your number rounded to the Tenth: 0.4
This is your number rounded to Hundredth: 0.432


```java
import java.util.Scanner;

public class reversingDigits {
    public static void main(String[] args) {
        int number, reverse;
        Scanner input = new Scanner(System.in);
        System.out.print("Type Number:");
        number = input.nextInt();
        reverse = reversingDigits(number);
        System.out.println("Reverse of typed number is: " + reverse);
        System.exit(0);
    }
    public static int reversingDigits(int num) {
        int reverse = 0;
        while (num > 0) {
            reverse = (reverse * 10) + num % 10;
            num = num / 10;
        }
        return reverse;
    }
}
```

ReverseDigits.Java solutions:

Number: 123
Reversed Number is 321