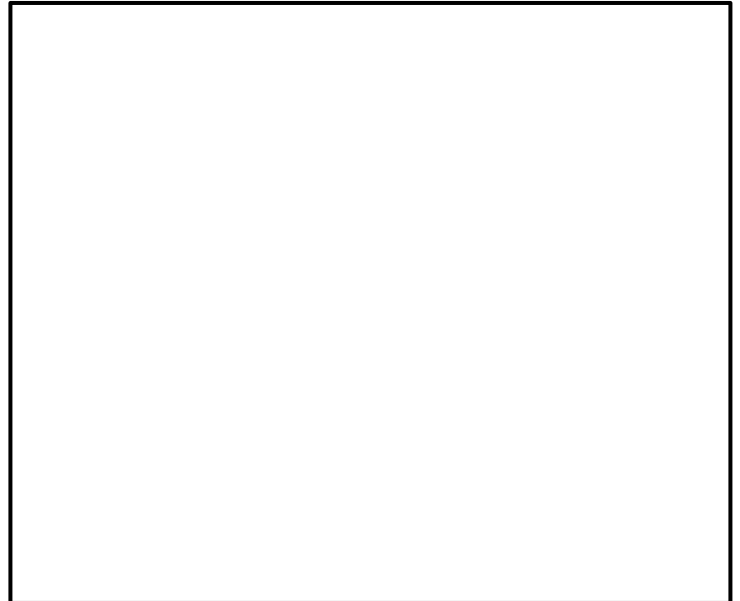


1. (20 Points) What is the output of the following:

```
int i = 0;
int j = 1;
int k = 2;
do {
    if (i <= j) {
        System.out.print("i = " + i + " : ");
        i += 2;
        j--;
    } else if (k <= j) {
        System.out.print("k = " + k + " : ");
        k++;
    } else {
        System.out.println("j = " + j);
        j += 3;
    }
} while (i <= 10);
System.out.println();
System.out.println("No More!");
```



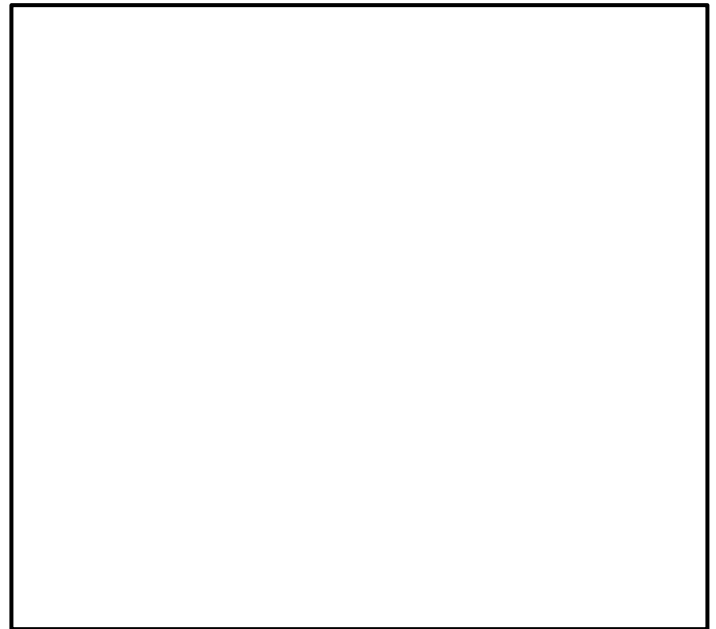
2. (25 Points) What is the output of the following:

```
for ( int i = 1 ; i <= 12 ; i += 2 ) {
    for ( int j = 0 ; j <= 20 ; j += 4 ) {
        for ( int k = 0 ; k <= 40 ; k += 8 ) {
            if ((j > k) && (i > k)) {
                continue;
            } else if (i < k) {
                break;
            }
            System.out.println(" i = " + i +
                               " j = " + j +
                               " k = " + k);
        }
    }
}
```



3. (25 Points) What is the output of the following:

```
for (int i = 5; i >= 0; i--) {  
    int k = 2 * i;  
    switch (k) {  
        case 0:  
            System.out.println(i + ":" + (k-i));  
        case 2:  
            System.out.println(i + ":" + (k-i)*2);  
            break;  
        case 4:  
            System.out.println(i + ":" + (k-i)*4);  
        case 6:  
            System.out.println(i + ":" + (k-i)*6);  
            break;  
        case 8:  
            System.out.println(i + ":" + (k-i)*4);  
        default:  
            System.out.println(i + ":" + (k-i)*2);  
            break;  
    }  
}
```



4. (40 Points) Write a complete Java class named **Shopping** that has the following **private** attributes:

- An array of **String** named **itemNames**.
- An array of **double** named **itemPrices**.
- An **int** named **numItems**.
- A **double** named **taxRate**.

And the following methods:

- public Shopping()** – Creates the arrays (with a size of 10) and initializes the **numItems** to zero and the **taxRate** 8.875%.
- Getters for all the attributes.
- public void addItem(String name, double price)**. This method adds an item with the given name and price to the arrays and maintains the count of items in **numItems**.
- public double computeTax()**. This method computes the amount of tax due for the purchased items included in the arrays.
- public double computeTotal()**. This method computes the total amount due for the purchased items included in the arrays, plus the tax that is due.
- public boolean equals(Object obj)**. Two shopping spree objects are equal if their **numItems** are equal, their **taxRate** are equal and all their **itemNames** and **itemPrices** are all equal.
- public String toString()**. This method returns an itemized **String** representing the receipt of all the items purchased, the tax due and the total due.

1. (20 Points) What is the output of the following:

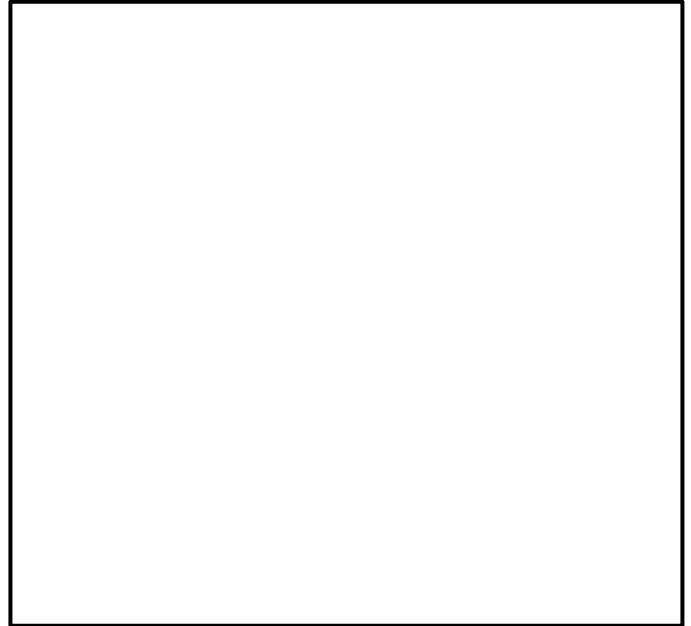
```
int i = 0;
int j = 2;
int k = 4;
do {
    if (i <= j) {
        System.out.print("i = " + i + " : ");
        i += 4;
        j -= 1;
    } else if (k <= j) {
        System.out.print("k = " + k + " : ");
        k += 3;
    } else {
        System.out.println("j = " + j);
        j += 5;
    }
} while (i <= 20);
System.out.println();
System.out.println("No More!");
```

2. (20 Points) What is the output of the following:

```
for ( int i = 1 ; i <= 24 ; i += 4 ) {
    for ( int j = 0 ; j <= 40 ; j += 8 ) {
        for ( int k = 0 ; k <= 80 ; k += 16 ) {
            if ((j > k) && (i > k)) {
                continue;
            } else if (i < k) {
                break;
            }
            System.out.println(" i = " + i +
                               " j = " + j +
                               " k = " + k);
        }
    }
}
```

3. (20 Points) What is the output of the following:

```
for (int i = 10; i >= 0; i -= 2) {  
    int k = 3 * i;  
    switch (k) {  
        case 0:  
            System.out.println(i + ":" + (k - i));  
        case 6:  
            System.out.println(i + ":" + (k - i)*9);  
            break;  
        case 12:  
            System.out.println(i + ":" + (k - i)*7);  
        case 18:  
            System.out.println(i + ":" + (k - i)*5);  
            break;  
        case 24:  
            System.out.println(i + ":" + (k - i)*3);  
        default:  
            System.out.println(i + ":" + (k - i)*2);  
            break;  
    }  
}
```



4. (40 Points) Write a complete Java class named `Dinner` that has the following `private` attributes:

- An array of `String` named `dishNames`.
- An array of `double` named `dishPrices`.
- An `int` named `numDishes`.
- A `double` named `taxRate`.

And the following methods:

- `public Dinner()` – Creates the arrays (with a size of 10) and initializes the `numDishes` to zero and the `taxRate` 8.875%.
- Getters for all the attributes.
- `public void addDish(String name, double price)`. This method adds a dish with the given name and price to the arrays and maintains the count of dishes in `numDishes`.
- `public double computeTax()`. This method computes the amount of tax due for the purchased dishes included in the arrays.
- `public double computeTotal()`. This method computes the total amount due for the purchased items included in the arrays, plus the tax that is due.
- `public boolean equals(Object obj)`. Two `Dinner` objects are equal if their `numDishes` are equal, their `taxRate` are equal and all their `dishNames` and `dishPrices` are all equal.
- `public String toString()`. This method returns an itemized `String` representing the receipt of all the dishes purchased, the tax due and the total due.