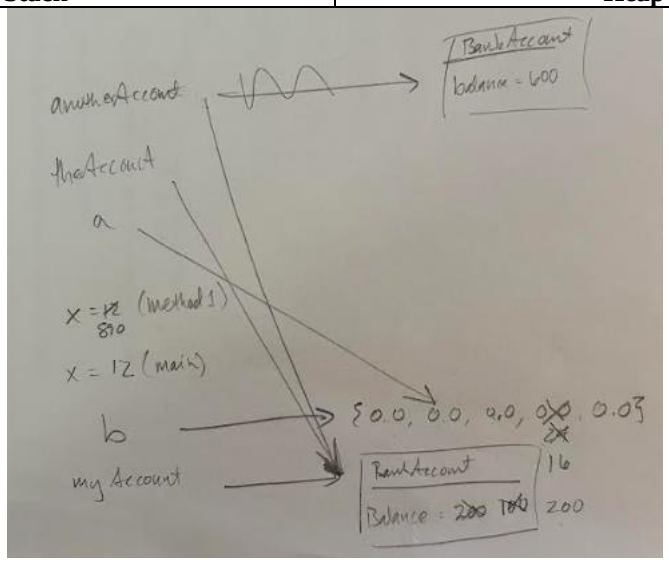
Name _____ Period_____

1. Complete the stack/heap diagram for the following code segment. Then, indicate what is printed.

```
public class BankDriver {

    static BankAccount myAccount = new BankAccount(200); //sets balance to 200

    public static void main(String[] args)
    {
        double b[] = new double[5];
        b[3] = 24;
        int x = 12;
        method1(x, b, myAccount);
        BankAccount anotherAccount = new BankAccount(600);//sets balance = 600
        anotherAccount = myAccount;
        System.out.println(x + " " + b[3] + " " + myAccount.balance);
    }

    public static void method1(int x, double a[], BankAccount theAccount){

        x = 890;
        a[3] = 16;
        theAccount.balance = 100;
        myAccount.deposit(100); //adds 100 to the balance
    }
}
```

Stack	Heap



What is printed when the code above is executed?

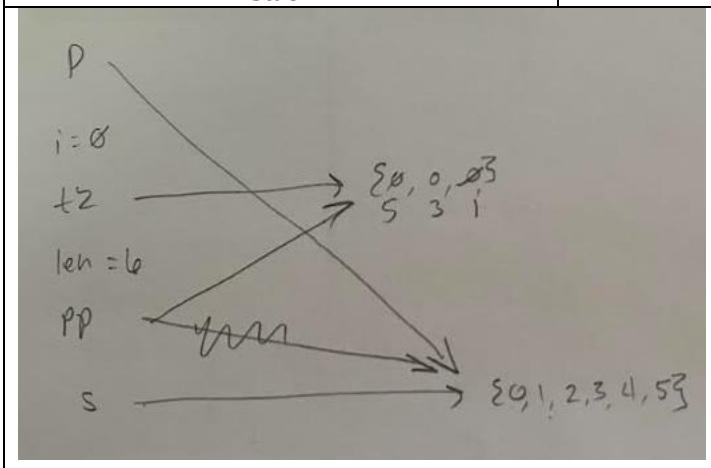
12 16 200

/4

2. Complete the stack/heap diagram for the following code segment. Then, indicate what is printed.

```
public class Testing3 {
    public static void main(String args[]){
        int s[] = {0,1,2,3,4,5};

        for(int g = 0; g < s.length; g++)
            System.out.print(s[g] + " ");

        System.out.print("\n");
        testMethod(s);

        int p[] = s;

        for(int g = 0; g < s.length; g++)
             System.out.print(p[g] + " ");
      }

      public static void testMethod(int pp[]){
        int len = pp.length;
        int t2[] = new int[len/2];
        int i = 0;

        for(int j=len/2-1; j>=0; j--){
           i+=2;
           t2[j] = pp[i-1];
        }
        for(int k=0; k<t2.length; k++)
             System.out.print(t2[k] + " ");

        System.out.print("\n");
        pp = t2;
      }
}
```

Score _____/30

Stack	Heap
	

What is printed when the code above is executed?

0 1 2 3 4 5
5 3 1
0 1 2 3 4 5

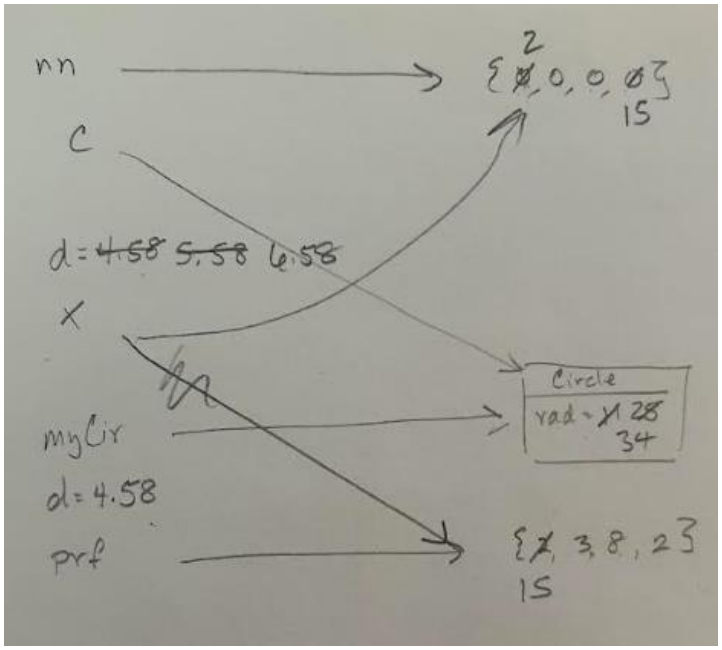
/4

3. Complete the stack/heap diagram for the following code segment. Then, indicate what is printed.

```
public class Testing
{
    public static void main(String args[])
    {
        int [] prf = {2,3,8,2};
        double d = 4.58;
        Circle myCir = new Circle(11);//set rad = 11
        myCir.rad = 25;
        fg(prf, d, myCir);

        System.out.println(d);
        System.out.println(prf[0]);
        System.out.println(myCir.rad);
    }

    public static void fg(int [] x, double d, Circle c)
    {
        d++;
        x[0] = 15;
        c.rad = 34;
        System.out.println(++d);
```

```
        int nn[] = new int[x.length];
        nn[3] = x[0];
        x = nn;
        x[0] = 2;
    }
}
```

Stack	Heap



What is printed when the code is executed?
6.58
4.58
15
34

/4

4. This question involves the implementation of a class, called `StringManip`, which is used to perform manipulation on strings.

   The class provides the following methods,

   - `removeSpaces`, takes a string and returns a new string with the spaces removed. For example, `removeSpaces("hi how are you")`, returns `"hihowareyou"`.
   - `reverseString`, which takes a string and returns a new string with the characters in reverse order. For example, reverseString("ABCDE") should return "EDCBA".
   - `palindromeChecker`, takes a string and determines whether the string is a palindrome and prints a message indicating the result. Examples of the intended behavior of the method are shown in the following table.

Method Call	Printed Message
palindromeChecker("taco cat")	taco cat is a palindrome
palindromeChecker("laid on no dial")	laid on no dial is a palindrome
palindromeChecker("level up")	level up is not a palindrome

The following table illustrates how the `StringManip` class works.

Statements and Expressions	**Value Returned (blank if no value)**	**Comment**
`StringManip.removeSpaces("laid on no dial");`	laidonnodial	Returns a string with the spaces removed
`StringManip.reversString("laid on no dial");`	laid on no dial	Returns a string in reverse order
`StringManip.palindromeChecker("laid on no dial")`	laid on no dial is a palindrome	Returns a message indicating whether or not the string is a palindrome
`StringManip.palindromeChecker("taco cat")`	taco cat is a palindrome	Returns a message indicating whether or not the string is a palindrome
`StringManip.palindromeChecker("level up");`	level up is not a palindrome	Returns a message indicating whether or not the string is a palindrome

Write the complete `StringManip` class, including the necessary constructors and any required instance variables and methods. Your implementation must meet all specifications and conform to the example.

```
public static String removeSpaces(String phrase){
    String result = "";
    for(int letter = 0; letter < phrase.length(); letter++){
        if(!phrase.substring(letter, letter+1).equals(" ")){
            result += phrase.substring(letter, letter+1);
        }
    }
    return result;
}

public static String reverseString(String phrase){
    String result = "";
    for(int letter = phrase.length() - 1; letter >=0; letter--){
        result += phrase.substring(letter, letter + 1);
    }
    return result;
}

public static String palindromeChecker(String phrase){
    String result = removeSpaces(phrase);
    String reverse = reverseString(result);
    if(result.equals(reverse)){
        return phrase + " is a palindrome";
    }
    return phrase + " is not a palindrome";
}
```

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Score _____/30

5. The following class represents a `customer`. The variable `name` represents the name of the customer, and the variable `currAccNum` represents the customer's account number. Each time a `Customer` object is created, the static variable `nextAccNum` is used to assign the customer's account number.

```
public class Customer
{
    private static int nextAccNum = 1;
    private String name;
    private int currAccNum;

    public Customer(String n) {
        name = n;
        currAccNum = nextAccNum;
        nextAccNum++;
    }
}
```

(a) Write a method for the `Customer` class that that will return a string representing a bill notice when passed a double value representing an amount due.

For example, if the customer has name "Jeremiah", has account number 3, and has amount due 50.50, the method should return a string in the following format.

```
Jeremiah, account number 3, please pay $50.50
```

Write the method below. Your implementation must conform to the example above.

```
public String generateBill(double amount)
{
   return name + ", account number " + currAccNum +
          ", please pay $" + amount;
}
```

/2

Score _____/30

(b) Write a method for the `Customer` class that returns the value of the next account number that will be assigned.

```
public static int getNextAccNum()
{
    return nextAccNum;
}
```

/2

(c) A student has written the following method to be included in the Customer class. The method is intended to update the name of a customer but does not work as intended.

```
public void updateName(String name)
{
    name = name;
}
```

Write a correct implementation of the updateName method that avoids the error in the student's implementation.

```
public void updateName(String newName)
{
    name = newName;
}
```

Or

```
public void updateName(String name)
{
    this.name = name;
}
```

/1

Score _____/30