1.	Design a Simple Calculator using methods in java containing the following functionalities, namely, with Addition, Subtraction, Multiplication, Remainder, Division and Square Root.
Code.	

```java
package ASSIGNMENT_6;
import java.util.*;
public class p1 {
    public static int additionSimple(int x , int y) {
        return x + y;
    }
    public static int subtrationSimple(int x , int y) {
        return x - y;
    }
    public static int multiplicationSimple(int x , int y) {
        return x * y;
    }
    public static double divisionSimple(int x , int y) {
        return x / y;
    }
    public static int remainderSimple(int x , int y) {
        return x % y;
    }
    public static double squarerootSimple (int x) {
        return Math.sqrt(x);
    }
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("1. Addition (+)\n2. Subbtration (-)\n3. Multiplicattion (*)\n4. Division (/)\n5. Remainder (%)\n6. Squara root (sq)");
        System.out.print("Enter the operation (1-6) you want to perform : ");
        int o = sc.nextInt();
        int n1 , n2 ;

        switch(o) {
            case 1 :
                System.out.print("Enter 1st Number : ");
                n1 = sc.nextInt();
                System.out.print("Enter 2st Number : ");
                n2 = sc.nextInt();
                System.out.println("The result is " + additionSimple(n1, n2));
            break;
            case  2 :
                System.out.print("Enter 1st Number : ");
```

```
                n1 = sc.nextInt();
                System.out.print("Enter 2st Number : ");
                n2 = sc.nextInt();
                System.out.println("The result is " +
subtrationSimple(n1, n2));
            break;
            case 3 :
                System.out.print("Enter 1st Number : ");
                n1 = sc.nextInt();
                System.out.print("Enter 2st Number : ");
                n2 = sc.nextInt();
                System.out.println("The result is " +
multiplicationSimple(n1, n2));
            break;
            case 4 :
                System.out.print("Enter 1st Number : ");
                n1 = sc.nextInt();
                System.out.print("Enter 2st Number : ");
                n2 = sc.nextInt();
                System.out.println("The result is " +
divisionSimple(n1, n2));
            break;
            case 5 :
                System.out.print("Enter 1st Number : ");
                n1 = sc.nextInt();
                System.out.print("Enter 2st Number : ");
                n2 = sc.nextInt();
                System.out.println("The result is " +
remainderSimple(n1, n2));
            break;
            case 6 :
                System.out.print("Enter a Number : ");
                n1 = sc.nextInt();
                System.out.println("The result is " +
squarerootSimple(n1));
            break;
        }
        sc.close();
    }
}
```

Output.

1. Addition (+)
2. Subbtration (-)
3. Multiplicattion (*)
4. Division (/)
5. Remainder (%)
6. Squara root (sq)

	Enter the operation (1-6) you want to perform : 6 Enter a Number : 25 The result is 5.0
2.	A pentagonal number is defined as n (3n–1)/2 for n = 1, 2, . . ., and so on. Therefore, the first few numbers are 1, 5, 12, 22, ... Write a method with the following header that returns a pentagonal number: `public static int getPentagonalNumber(int n)` Write a java program that uses this method to display the first 100 pentagonal numbers with 10 numbers on each line.

Code.	`package ASSIGNMENT_6;`
	`import java.util.*;`
	`public class p2 {`
	`public static int getPentagonalNumber(int n) {`
	`return n * (3 * n - 1) / 2;`
	`}`
	`public static void main(String[] args) {`
	`Scanner sc = new Scanner(System.in);`
	`System.out.print("Enter the total no. you want to display : ");`
	`int n = sc.nextInt();`
	
	`for (int i=1 ; i<=n ; i++) {`
	`int ans = getPentagonalNumber(i);`
	`System.out.print(ans + " , ");`
	`if (i % 10 == 0) {`
	`System.out.println();`
	`}`
	`}`
	`sc.close();`
	`}`
	`}`

Output.	Enter the total no. you want to display : 100 1 , 5 , 12 , 22 , 35 , 51 , 70 , 92 , 117 , 145 , 176 , 210 , 247 , 287 , 330 , 376 , 425 , 477 , 532 , 590 , 651 , 715 , 782 , 852 , 925 , 1001 , 1080 , 1162 , 1247 , 1335 , 1426 , 1520 , 1617 , 1717 , 1820 , 1926 , 2035 , 2147 , 2262 , 2380 , 2501 , 2625 , 2752 , 2882 , 3015 , 3151 , 3290 , 3432 , 3577 , 3725 , 3876 , 4030 , 4187 , 4347 , 4510 , 4676 , 4845 , 5017 , 5192 , 5370 , 5551 , 5735 , 5922 , 6112 , 6305 , 6501 , 6700 , 6902 , 7107 , 7315 , 7526 , 7740 , 7957 , 8177 , 8400 , 8626 , 8855 , 9087 , 9322 , 9560 , 9801 , 10045 , 10292 , 10542 , 10795 , 11051 , 11310 , 11572 , 11837 , 12105 , 12376 , 12650 , 12927 , 13207 , 13490 , 13776 , 14065 , 14357 , 14652 , 14950 ,

3.	Write the methods with the following headers
	// Return the reversal of an integer. Example: `reverse (456)`, returns 654
	public static int reverse(int number)
	// Return true if number is a palindrome
	public static boolean isPalindrome(int number)

	Use the reverse method to implement isPalindrome. A number is a palindrome if its reversal is the same as itself. Write a java program that prompts the user to enter an integer and reports whether the integer is a palindrome.
Code.	

```java
package ASSIGNMENT_6;
import java.util.*;
public class p3 {
    public static int reverse (int n) {
        int rev = 0;
        while (n != 0) {
            rev = (rev * 10) + (n % 10);
            n = n / 10;
        }
        return rev;
    }
    public static boolean isPalindrome(int n) {
        int rev_num = reverse(n);
        return n == rev_num;
    }
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number : ");
        int n = sc.nextInt();

        if (isPalindrome(n)) {
            System.out.println(n + " is a palindrome Number");
        } else {
            System.out.println(n + " is not a palindrome Number");
        }
        sc.close();
    }
}
```

Output.	Enter a number : 12321 12321 is a palindrome Number Enter a number : 12345 12345 is not a palindrome Number
4.	Write a method that returns the number of days in a year using the following header: *public static int numberOfDaysInAYear(int year)* Write a java program that displays the number of days in year from 2000 to 2020
Code.	

```java
package ASSIGNMENT_6;

public class p4 {
    public static int numberOfDayInAYear(int year) {
        if (year % 4 == 0 && (year % 100 != 0 || year % 400 == 0)) {
            return 366;
        } else {
```

```
            return 365;
        }
    }
    public static void main(String[] args) {
        for (int year=2000 ; year<=2020 ; year++) {
            System.out.println(year + " has " +
numberOfDayInAYear(year) + " days");
        }
    }
}
```

Output.

```
2000 has 366 days
2001 has 365 days
2002 has 365 days
2003 has 365 days
2004 has 366 days
2005 has 365 days
2006 has 365 days
2007 has 365 days
2008 has 366 days
2009 has 365 days
2010 has 365 days
2011 has 365 days
2012 has 366 days
2013 has 365 days
2014 has 365 days
2015 has 365 days
2016 has 366 days
2017 has 365 days
2018 has 365 days
2019 has 365 days
2020 has 366 days
```

5. A regular polygon is an *n*-sided polygon in which all sides are of the same length and all angles have the same degree (i.e., the polygon is both equilateral and equiangular). The formula for computing the area of a regular polygon is

Area = $n * s^2 / 4 \times \tan(\pi/n)$

Write a method that returns the area of a regular polygon using the following header: public static double area(int n, double side)

Code.

```
package ASSIGNMENT_6;
import java.util.*;
public class p5 {
    public static double area(int n , double s) {
        double area = (n * s * s) / (4 * Math.tan(Math.PI/n));
        return area;
    }
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the value of n : ");
```

```
        int n = sc.nextInt();
        System.out.print("Enter the side : ");
        double s = sc.nextDouble();

        System.out.println(area(n, s));
        sc.close();
    }
}
```

Output.

```
Enter the value of n : 7
Enter the side : 6
130.82084798405722
```

6. Write a method that finds the number of occurrences of a specified character in a string using the following header:

`public static int count(String str, char a)`

`For example, count ("Welcome", 'e')` returns 2.

Write a java program that prompts the user to enter a string followed by a character and displays the number of occurrences of the character in the string.

public static int count(String str, char a)

Code.

```
package ASSIGNMENT_6;
import java.util.*;

public class p6 {
    public static int count (String str , char a) {
        int count = 0;
        for (int i=0 ; i<str.length() ; i++) {
            if (str.charAt(i) == a) {
                count++;
            }
        }
        return count;
    }
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the word : ");
        String str = sc.next();
        System.out.print("Enter the charater : ");
        char a = sc.next().charAt(0);

        int count = count(str, a);
        System.out.println("count (\"" + str + "\" , '" + a + "')
returns " + count);
        sc.close();
    }
}
```

Output.

```
Enter the word : javaprogram
Enter the charater : p
```

	count ("javaprogram" , 'p') returns 1 Enter the word : javaprogram Enter the charater : a count ("javaprogram" , 'a') returns 3
7.	Write java method called *count* accepts a string as input and returns the number of vowels in it. The method header is given below. `public static int count(String str)`
Code.	

```java
package ASSIGNMENT_6;
import java.util.*;
public class p7 {
    public static int count(String  str) {
        int count = 0;
        for (int i=0 ; i<str.length() ; i++) {
            char ch = str.charAt(i);
            if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch
== 'u' ||
                ch == 'A' || ch == 'B' || ch == 'I' || ch == 'O' || ch
== 'U') {
                    count++;
                }
        }
        return count;
    }
    public static void main(String[] args) {
        Scanner sc = new  Scanner (System.in);
        System.out.print("Enter the word : ");
        String str = sc.next();

        int count = count(str);
        System.out.println("count (\"" + str + "\") returns " + count);
        sc.close();
    }
}
```

Output.	Enter the word : program count ("program") returns 2
8.	Write a java method to check a string is palindrome or not.
Code.	

```java
package ASSIGNMENT_6;
import java.util.*;
public class p8 {
    public static boolean reverseCheck(String str) {
        String revcheck = reverseString(str);
        return str.equals(revcheck);
    }
    public static String reverseString(String str) {
        String rev = "";
```

```
        for (int i=str.length()-1 ; i>=0 ; i--) {
            rev = rev + str.charAt(i);
        }
        return rev;
    }
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the word : ");
        String str = sc.next();

        if (reverseCheck(str)) {
            System.out.println(str + " is a palindrome");
        } else {
            System.out.println(str + " is not a palindrome");
        }
        sc.close();
    }
}
```

Output.

```
Enter the word : MADAM
MADAM is a palindrome

Enter the word : java
java is not a palindrome
```

9. Some websites impose certain rules for passwords.
Write a method that checks whether a string is a valid password. Suppose the password rules are as follows:

- A password must have at least eight characters.
- A password consists of only letters and digits.
- A password must contain at least two digits.

Write a program that prompts the user to enter a password and displays *Valid Password* if the rules are followed or *Invalid Password* otherwise.

Code.

```
package ASSIGNMENT_6;
import java.util.*;
public class p9 {
    public static boolean isValidPassword(String password) {
        if (password.length() < 8) {
            return false;
        }
        int count = 0;
        for (int i=0 ; i< password.length() ; i++) {
            char c = password.charAt(i);
            if (!Character.isLetterOrDigit(c)) {
                return false;
            }
            if (Character.isDigit(c)) {
                count++;
```

```
            }
        }
        return count >= 2;
    }
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the password : ");
        String password = sc.nextLine();

        if (isValidPassword(password)) {
            System.out.println("Valid password");
        } else {
            System.out.println("Invalid password");
        }
        sc.close();
    }
}
```

Output.

Enter the password : java
Invalid password

Enter the password : javaprogram
Invalid password

Enter the password : javaprogram2023
Valid password

10. Write a java program to calculate the area of triangle, square, circle, rectangle by using method overloading

Code.

```
package pratice_A6;
import java.util.*;
public class p10 {
    void area(double base , double height) {
        double area = 0.5 * base * height;
        System.out.println("The area of Triangle is " + area);
    }
    void area(int side) {
        double area = side * side;
        System.out.println("The area of Square is " + area);
    }
    void area(double radius) {
        double area = Math.PI * radius * radius;
        System.out.println("The area of Circle is " + area);
    }
    void area(int length , int breadth) {
        double area = length * breadth;
        System.out.println("The area of rectrangle is " + area);
    }
```

```
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("1. Triangle\n2. Square\n3. Circle\n4.
Rectrangle");
        System.out.print("Enter your choice(1-4) : ");
        int choice = sc.nextInt();

        p10 obj = new p10();
        switch(choice) {
            case 1 :
                System.out.print("Enter the base : ");
                double base = sc.nextDouble();
                System.out.print("Enter the height : ");
                double height = sc.nextDouble();
                obj.area(base, height);
            break;
            case 2 :
                System.out.print("Enter the side : ");
                int side = sc.nextInt();
                obj.area(side);
            break;
            case 3 :
                System.out.print("Enter the radius : ");
                double radius = sc.nextDouble();
                obj.area(radius);
            break;
            case 4 :
                System.out.print("Enter the length : ");
                int length = sc.nextInt();
                System.out.print("Enter the breadth : ");
                int breadth = sc.nextInt();
                obj.area(length, breadth);
            break;
            default : System.out.println("Invalid Number !");
        }
        sc.close();
    }
}
```

Output.

```
Enter the shape for calculation :
1. Triangle
2. Square
3. Circle
4. Rectangle
Enter you choice (1-4) : 2
Enter the side of the square : 10
The area of the square is 100.0
```

HW_1.	Write a program to find the first non-repeated character in a given String, for example, if the given String is "Java" then the first non-repeated character is "J".
Code.	

```java
package ASSIGNMENT_6;
import java.util.*;
public class HW_1 {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the String : ");
        String str = sc.next();

        for (int i=0 ; i<str.length() ; i++) {
            boolean unique_char = true;
            for (int j=0 ; j<str.length() ; j++) {
                if (i != j && str.charAt(i) == str.charAt(j)) {
                    unique_char = false;
                }
            }
            if (unique_char) {
                System.out.println(str.charAt(i));
                break;
            }
        }
        sc.close();
    }
}
```

Output.	Enter the String : java j Enter the String : jjava v
HW_2.	Write a java program to calculate the volume of sphere, cuboid and cube by using method overloading. Volume of a cube = s * s * s [s: Side of the cube] Volume of a Sphere = $\frac{4}{3} \times \pi \times r^3$ [r: radius] Volume of a cuboid = L × b × h [L: Length, b: Breadth, h: Height]
Code.	

```java
package ASSIGNMENT_6;
import java.util.*;
public class HW_2 {
    void volume(double radius) {
        double volume = 4.0/3 * Math.PI * Math.pow(radius, 3);
        System.out.println("The volume of sphere is " + volume);
    }
    void volume(double length , double breath , double height) {
        double volume = length * breath * height;
        System.out.println("The volume of cubiod is " + volume);
    }
```

```
    void volume(int side) {
        double volume = Math.pow(side, 3);
        System.out.println("The volume of cube is " + volume);
    }
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the shape you want to find the volume
: ");
        System.out.println("1. Sphere\n2. Cuboid \n3. Cube");
        System.out.print("Enter you choice (1-3) : ");
        int choice = sc.nextInt();

        HW_2 obj = new HW_2();

        switch(choice) {
            case 1 :
                System.out.print("Enter the radius of the sphere : ");
                double radius = sc.nextDouble();
                obj.volume(radius);
            break;
            case 2 :
                System.out.print("Enter the length of the cuboid : ");
                double lenght = sc.nextDouble();
                System.out.print("Enter the breath of the cuboid : ");
                double breadth = sc.nextDouble();
                System.out.print("Enter the heigth of the cuboid : ");
                double height = sc.nextDouble();
                obj.volume(lenght, breadth, height);
            break;
            case 3 :
                System.out.print("Enter the side of the cube : ");
                int side = sc.nextInt();
                obj.volume(side);
            break;
            default : System.out.println("Invalid choice");
            break;
        }
        sc.close();
    }
}
```

Output.

```
Enter you choice (1-3) : 2
Enter the length of the cuboid : 10
Enter the breath of the cuboid : 5
Enter the heigth of the cuboid : 20
The volume of the cubiod is 1000.0
```

HW_3.	Write a Java method to display the middle character of a string.
	Note:
	a) If the length of the string is odd there will be one middle characters.
	b) If the length of the string is even, then there would be two middle characters, we need to print the second middle character.
	
	Example: Input a string: ABC
	Expected Output:
	`The middle character in the string: B`
	Example: Input a string: JAVA
	Expected Output:
	`The middle character in the string: V`

Code.	

```java
package ASSIGNMENT_6;
import java.util.*;
public class HW_3 {
    public static char forOddString(String word) {
        char c = word.charAt(word.length() - (word.length()/2)-1);
        return c;
    }
    public static char forEvenString(String word) {
        char c = word.charAt(word.length() - (word.length()/2));
        return c;
    }
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the word : ");
        String word = sc.next();

        if (word.length() % 2 == 0) {
            System.out.println(forEvenString(word));
        } else {
            System.out.println(forOddString(word));
        }
        sc.close();
    }
}
```

Output.	Enter the word : ABC B Enter the word : JAVA V

HW_4.	Write a Java method to count all words in a string.
	Example: `Input the string:`
	`The quick brown fox jumps over the lazy dog.`
	Expected Output:
	`Number of words in the string: 9`

Code.	

```java
package ASSIGNMENT_6;
```

```java
import java.util.*;
public class HW_4 {
    public static int wordCount(String str) {
        String [] words = str.split(" ");
        return words.length;
    }
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the line : ");
        String str = sc.nextLine();

        System.out.println("Number of word in the give line is " +
wordCount(str));
        sc.close();
    }
}
```

Output.

Enter the line : The quick brown fox jumps over the lazy dog.
Number of word in the give line is 9

HW_5.

Write a Java method that accept three integers and check whether they are consecutive are not. Return true or false.

Expected Output:

```
Input the first number: 15
Input the second number: 16
Input the third number: 17
Check whether the three said numbers are consecutive or
not!
true
```

Code.

```java
package ASSIGNMENT_6;
import java.util.*;
public class HW_5 {
    public static boolean checkConsecutive(int x , int y , int z) {
        if ((y == (x+1) && z == (x+2)) || y == (x-1) && z == (x-2)) {
            return true;
        } else {
            return false;
        }
    }
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter the 1st Number : ");
        int n1 = sc.nextInt();
        System.out.print("Enter the 2nd Number : ");
        int n2 = sc.nextInt();
        System.out.print("Enter the 3rd Number : ");
        int n3 = sc.nextInt();
```

```
        System.out.println("check whether the three said number are
consecutive or not !");
        System.out.println(checkConsecutive(n1, n2, n3));
        sc.close();
    }
}
```

Output.

```
Enter the 1st Number : 15
Enter the 2nd Number : 16
Enter the 3rd Number : 17
check whether the three said number are consecutive or not !
true

Enter the 1st Number : 17
Enter the 2nd Number : 15
Enter the 3rd Number : 16
check whether the three said number are consecutive or not !
false
```