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Q1. How to check Even and Odd numbers in java using object oriented approach?

Ans:

This is a Java Program to Check if a Given Integer is Odd or Even.
Enter any integer number as an input.
Now we check its remainder with modulo operator by two.
If remainder is zero the given number is even.
If remainder is 1 then the given number is odd.
Hence we show output according to the remainder
Here is the source code of the Java Program
to Check if a Given Integer is Odd or Even

```
import java.util.Scanner;
public class Odd_Even
```

```
{
   public static void main(String[] args)
   {
      int n;
      Scanner s = new Scanner(System.in);
      System.out.print("Enter the number you want to check:");
      n = s.nextInt();
      if(n % 2 == 0)
      {
         System.out.println("The given number "+n+" is Even ");
      }
      else
      {
         System.out.println("The given number "+n+" is Odd ");
        }
   }
}
```

Q2. How to add 2 complex numbers in java using object oriented approach?

Ans:

Example:

Add Two Complex Numbers

```
public class Complex {

   double real;
   double imag;

   public Complex(double real, double imag) {
      this.real = real;
      this.imag = imag;
```

```
    }

    public static void main(String[] args) {
        Complex n1 = new Complex(2.3, 4.5),
                n2 = new Complex(3.4, 5.0),
                temp;

        temp = add(n1, n2);

        System.out.printf("Sum = %.1f + %.1fi", temp.real, temp.imag);
    }

    public static Complex add(Complex n1, Complex n2)
    {
        Complex temp = new Complex(0.0, 0.0);

        temp.real = n1.real + n2.real;
        temp.imag = n1.imag + n2.imag;

        return(temp);
    }
}
```

Explination:

In the above program, we created
a class Complex with two member variables: real and imag.
As name suggests, real stores real part of a complex
number and imag stores the imaginary part.
The Complex class has a constructor with initializes
the value of real and imag.
We also created a new static function add() that takes
two complex numbers as parameters and returns
the result as a complex number.
Inside the add() method,
we just add the real and imaginary parts of complex numbers n1 and n2,
store it in a new variable temp and return temp.
Then, in the calling function main(),

we print it using printf() function.

Q3. How to check Leap year in java using object oriented approach?

Ans:

A leap year is exactly divisible by 4 except
for century years (years ending with 00).
The century year is a leap year
only if it is perfectly divisible by 400.

Example: Java Program to Check a Leap Year

```
public class LeapYear {

   public static void main(String[] args) {

      int year = 1900;
      boolean leap = false;

      if(year % 4 == 0)
      {
         if( year % 100 == 0)
         {
            // year is divisible by 400, hence the year is a leap year
            if ( year % 400 == 0)
               leap = true;
            else
               leap = false;
         }
         else
            leap = true;
      }
```

```
        else
            leap = false;

        if(leap)
            System.out.println(year + " is a leap year.");
        else
            System.out.println(year + " is not a leap year.");
    }
}
```

Explination:

In the above program
given year 1900 is stored in the variable year.
Since 1900 is divisble by 4 and is also a
century year (ending with 00), it has be divisble by 400 for a leap year.
Since it's not divisible by 400, 1900 is not a leap year.
But, if we change year to 2000,
it is divisible by 4, is a century year and is also divisible by 400.
So, 2000 is a leap year.

Likewise
If we change year to 2012, it is divisible by 4 and is not a century year,
so 2012 a leap year.
We don't need to check if 2012 is divisible by 400 or not.

Q4. How to check that the input from the user is the vowel or not in java using object oriented approach?

Ans:

Example 1:

Check whether an alphabet is vowel or consonant using if..else statement

```
public class VowelConsonant {
```

```
    public static void main(String[] args) {

        char ch = 'i';

        if(ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u' )
            System.out.println(ch + " is vowel");
        else
            System.out.println(ch + " is consonant");

    }
}
```

Explination:

In the above program, 'i' is stored in a char variable ch.
In Java, you use double quotes (" ") for strings and single quotes (' ') for characters.
Now, to check whether ch is vowel
or not, we check if ch is any of: ('a', 'e', 'i', 'o', 'u').
This is done using a simple if..else statement.
We can also check for vowel or consonant using a switch statement in Java

Example 2:

Check whether an alphabet is vowel or consonant using switch statement

```
public class VowelConsonant {

    public static void main(String[] args) {

        char ch = 'z';

        switch (ch) {
            case 'a':
            case 'e':
            case 'i':
            case 'o':
```

```
            case 'u':
               System.out.println(ch + " is vowel");
               break;
            default:
               System.out.println(ch + " is consonant");
         }
      }
}
```

Explination:

In the above program
 instead of using a long if condition, we replace
 it with a switch case statement.
If ch is either of cases: ('a', 'e', 'i', 'o', 'u'), vowel is printed.
Else, default case is executed and consonant is printed on the screen.

Q5. How to use power of a number in java using object oriented approach?

Ans:

Multiply the base number by itself and multiply the resultant with base (again) repeat this n times where n is the exponent value.
2 ^ 5 = 2 X 2 X 2 X 2 X 2 (5 times)

Example:

```
import java.util.Scanner;
public class PowerOfNumber {
   public static void main(String args[]){
      Scanner sc = new Scanner(System.in);
      System.out.println("Enter the base number ::");
      int base = sc.nextInt();
      int temp = base;
```

```
    System.out.println("Enter the exponent number ::");
    int exp = sc.nextInt();

    for (int i=1; i<exp; i++){
      temp = temp*temp;
    }
    System.out.println("Result of "+base+" power "+exp+" is "+temp);
  }
}
```