



IQRA NATIONAL UNIVERSITY

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SEMESTER **II**

ASSIGNMENT **LAB**

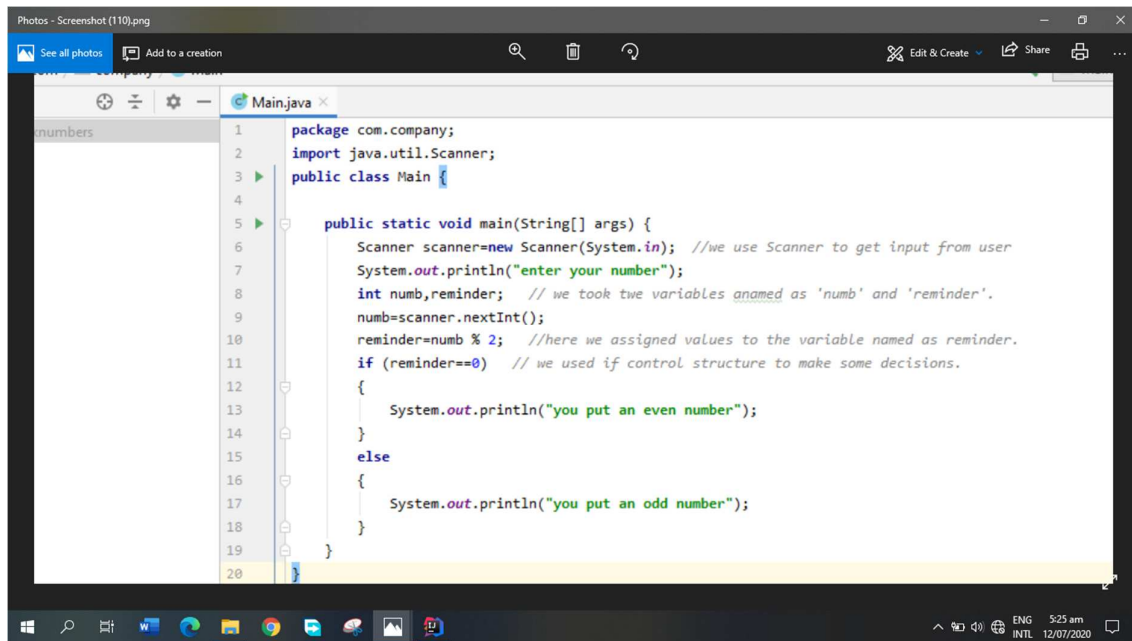
Q1. How to check Even and Odd numbers in java using object-oriented approach?

ANS=>

```
package com.company;
import java.util.Scanner;
public class Main {

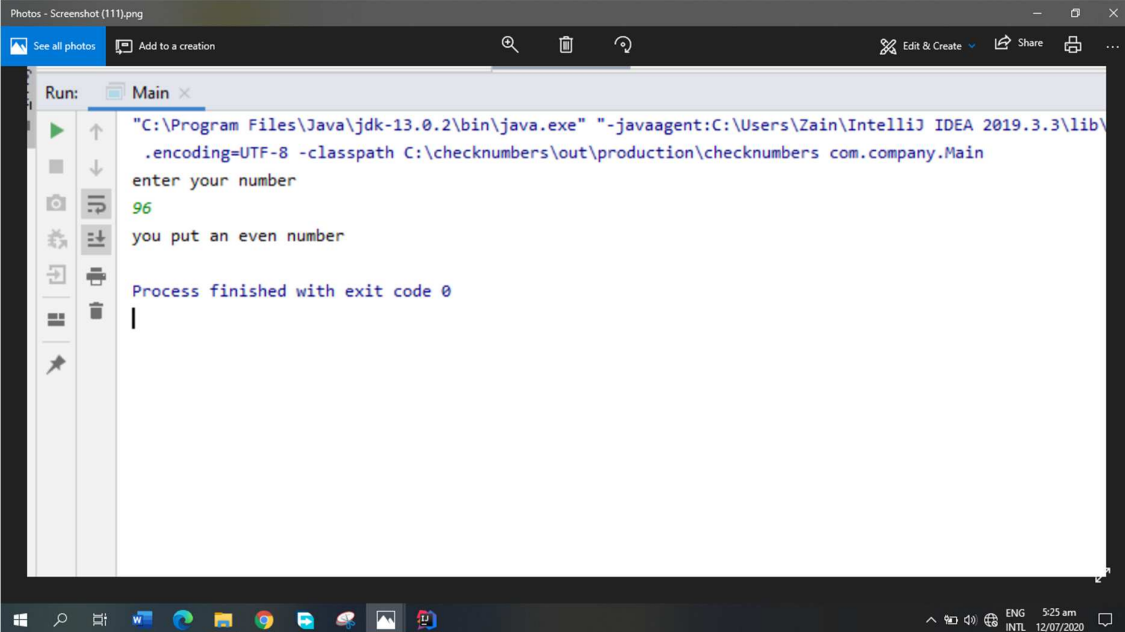
    public static void main(String[] args) {
        Scanner scanner=new Scanner(System.in); //we use Scanner to get input
        from user
        System.out.println("enter your number");
        int numb,remainder; // we took two variables anamed as 'numb' and
        'remainder'.
        numb=scanner.nextInt();
        remainder=numb % 2; //here we assigned values to the variable named as
        remainder.
        if (remainder==0) // we used if control structure to make some decisions.
        {
            System.out.println("you put an even number");
        }
        else
        {
            System.out.println("you put an odd number");
        }
    }
}
```

these are the screenshots of the coding.

A screenshot of a code editor window titled 'Main.java'. The code is identical to the one provided in the previous block. The editor has a dark theme and a sidebar on the left with a file explorer showing 'numbers'. The code is as follows:

```
1 package com.company;
2 import java.util.Scanner;
3 public class Main {
4
5     public static void main(String[] args) {
6         Scanner scanner=new Scanner(System.in); //we use Scanner to get input from user
7         System.out.println("enter your number");
8         int numb,remainder; // we took two variables anamed as 'numb' and 'remainder'.
9         numb=scanner.nextInt();
10        remainder=numb % 2; //here we assigned values to the variable named as
11        remainder.
12        if (remainder==0) // we used if control structure to make some decisions.
13        {
14            System.out.println("you put an even number");
15        }
16        else
17        {
18            System.out.println("you put an odd number");
19        }
20    }
21 }
```

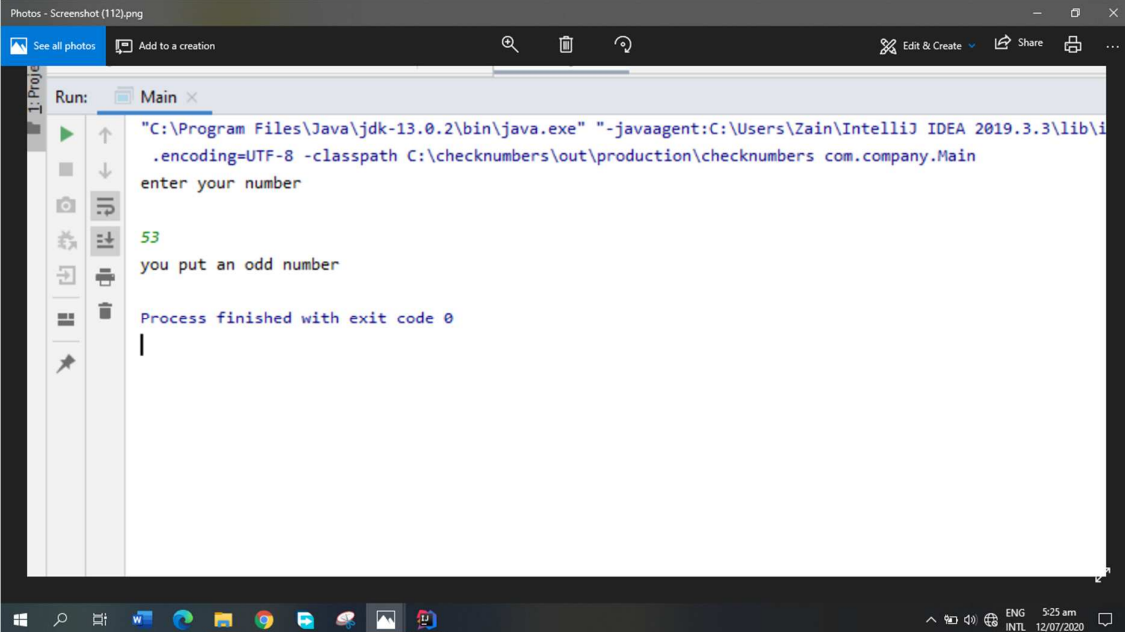
This is the main structure of the program.



```
Run: Main x
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Users\Zain\IntelliJ IDEA 2019.3.3\lib\
.encoding=UTF-8 -classpath C:\checknumbers\out\production\checknumbers com.company.Main
enter your number
96
you put an even number

Process finished with exit code 0
```

This is the output in which we checked number for even or odd. And in this output, we put an even number as shown in output.



```
Run: Main x
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Users\Zain\IntelliJ IDEA 2019.3.3\lib\i
.encoding=UTF-8 -classpath C:\checknumbers\out\production\checknumbers com.company.Main
enter your number
53
you put an odd number

Process finished with exit code 0
```

This is the output in which we checked number for even or odd. And in this output, we put an odd number as shown in output.

END OF QUESTION #1.

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

ANS=>

```
package com.company;

class ComplexNumbers // here we made a class named as 'ComplexNumbers'.
{
    double RealNumber, ImaginaryNumber; // here we took two variables with double
data type.

    ComplexNumbers(double Real, double Imaginary) // we made a constructor to
initialize ComplexNumbers.
    {
        this.RealNumber = Real;
        this.ImaginaryNumber = Imaginary;
    }

    public static ComplexNumbers Addition(ComplexNumbers N1, ComplexNumbers N2)
// we created temporary ComplexNumbers to hold the Addition/Sum of numbers.

    {
        ComplexNumbers temporary= new ComplexNumbers(0,0);
        temporary.RealNumber=N1.RealNumber + N2.RealNumber;
        temporary.ImaginaryNumber=N1.ImaginaryNumber + N2.ImaginaryNumber;
        return temporary; // returns the output complexNumbers.
    }

    public static void main(String[] args) {

        ComplexNumbers N1=new ComplexNumbers(3.44, 14);
        ComplexNumbers N2=new ComplexNumbers(11.58, 23);
        ComplexNumbers temporary= Addition(N1,N2);
        System.out.println("Sum is = "+ temporary.RealNumber+ "+"
+temporary.ImaginaryNumber+ "i");
    }
}
```

These are the screenshots of the coding.

```
package com.company;

class ComplexNumbers // here we made a class named as 'ComplexNumbers'.
{
    double RealNumber, ImaginaryNumber; // here we took two variables with double data type.

    ComplexNumbers(double Real, double Imaginary) // we made a constructor to initialize ComplexNumbers.
    {
        this.RealNumber = Real;
        this.ImaginaryNumber = Imaginary;
    }

    public static ComplexNumbers Addition(ComplexNumbers N1, ComplexNumbers N2) // we created temporary ComplexNumbers to hold the Addition/Sum of numbers.
    {
        ComplexNumbers temporary= new ComplexNumbers( Real: 0, Imaginary: 0);
        temporary.RealNumber=N1.RealNumber + N2.RealNumber;
        temporary.ImaginaryNumber=N1.ImaginaryNumber + N2.ImaginaryNumber;
        return temporary; // returns the output complexNumbers.
    }

    public static void main(String[] args) {

        ComplexNumbers N1=new ComplexNumbers( Real: 3.44, Imaginary: 14);
        ComplexNumbers N2=new ComplexNumbers( Real: 11.58, Imaginary: 23);
        ComplexNumbers temporary= Addition(N1,N2);
        System.out.println("Sum is = "+ temporary.RealNumber+ "+" +temporary.ImaginaryNumber+ "i");
    }
}
```

This is the main structure of program.

```
untitled4 | src | com | company | ComplexNumbers
Main.java x
Run: ComplexNumbers x
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Users\Zain\IntelliJ IDEA 2019.3.3\lib\idea_rt.jar" -encoding=UTF-8 -classpath C:\untitled4\out\production\untitled4 com.company.ComplexNumbers
Sum is = 15.02+37.0i

Process finished with exit code 0
```

This is the output of the program as we required.

END OF QUESTION #2.

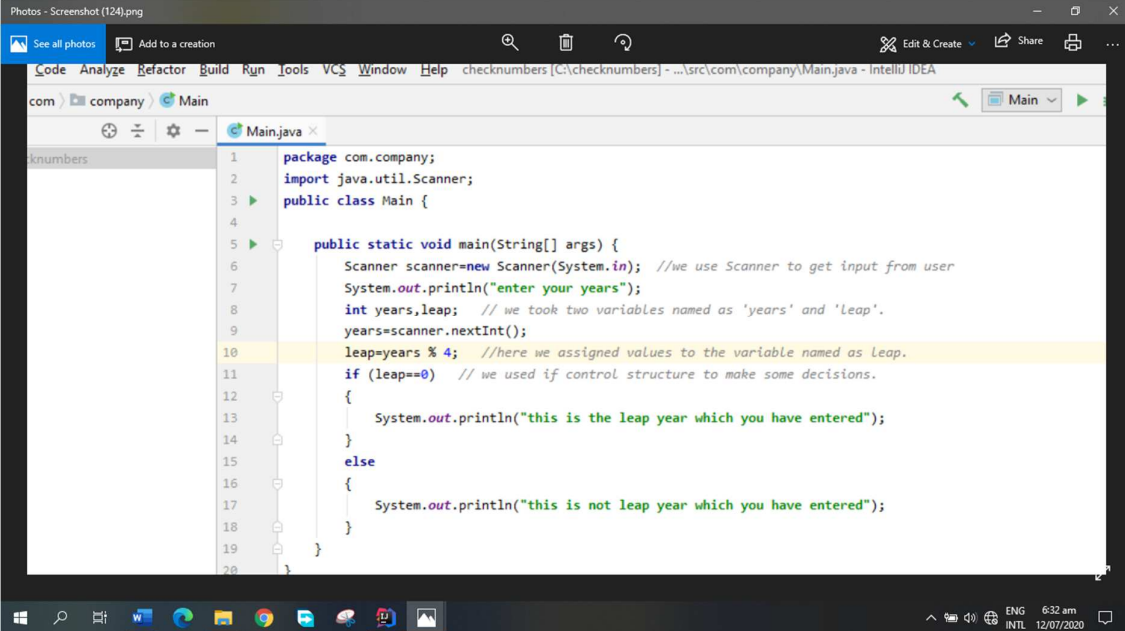
Q3. How to check Leap year in java using object- oriented approach?

ANS=>

```
package com.company;
import java.util.Scanner;
public class Main {

    public static void main(String[] args) {
        Scanner scanner=new Scanner(System.in); //we use Scanner to get input
        from user
        System.out.println("enter your years");
        int years,leap; // we took two variables named as 'years' and 'Leap'.
        years=scanner.nextInt();
        leap=years % 4; //here we assigned values to the variable named as leap.
        if (leap==0) // we used if control structure to make some decisions.
        {
            System.out.println("this is the leap year which you have entered");
        }
        else
        {
            System.out.println("this is not leap year which you have entered");
        }
    }
}
```

These are the screenshots of the coding.

A screenshot of an IDE window showing the Java code for checking a leap year. The code is displayed in a dark-themed editor with line numbers on the left. The code is identical to the one provided in the previous block. The IDE interface includes a menu bar at the top with options like 'Code', 'Analyze', 'Refactor', 'Build', 'Run', 'Tools', 'VCS', 'Window', and 'Help'. The file name 'Main.java' is visible in the editor's title bar. The Windows taskbar is visible at the bottom of the screenshot, showing the system clock as 6:32 am on 12/07/2020.

This is the main structure of program.

```
Run: Main x
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Users\Zain\IntelliJ IDEA 2019.3.3\lib\idea
.encoding=UTF-8 -classpath C:\checknumbers\out\production\checknumbers com.company.Main
enter your years

2016
this is the leap year which you have entered

Process finished with exit code 0
```

This is the output in which we checked years for leap. And in this output, we put a leap year as shown in output

```
Run: Main x
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Users\Zain\IntelliJ IDEA 2019.3.3\lib\ide
.encoding=UTF-8 -classpath C:\checknumbers\out\production\checknumbers com.company.Main
enter your years

1983
this is not leap year which you have entered

Process finished with exit code 0
|
```

This is the output in which we checked years for leap. And in this output, we did not put a leap year as shown in output.

END OF QUESTION #3.

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

ANS=>

1st method:

This is the first method by using It we can find our given alphabets whether they are vowel are not?

```
package com.company;

import java.util.Scanner;

public class Main {

    public static void main(String[] args) {
        // write your code here
        Scanner scanner=new Scanner(System.in); // using Scanner to get input from
user
        System.out.println("enter your alphabet");
        char ch; // used character data type
        ch= scanner.next().charAt(0);
        if (ch=='a' || ch=='e' || ch=='i' || ch=='o' || ch=='u' || ch=='A' ||
ch=='E' || ch=='I' || ch=='O' || ch=='U') // using if-else control structure
        {
            System.out.println("you entered a vowel alphabet");
        }
        else
        {
            System.out.println("you did not enter a vowel alphabet");
        }
    }
}
```

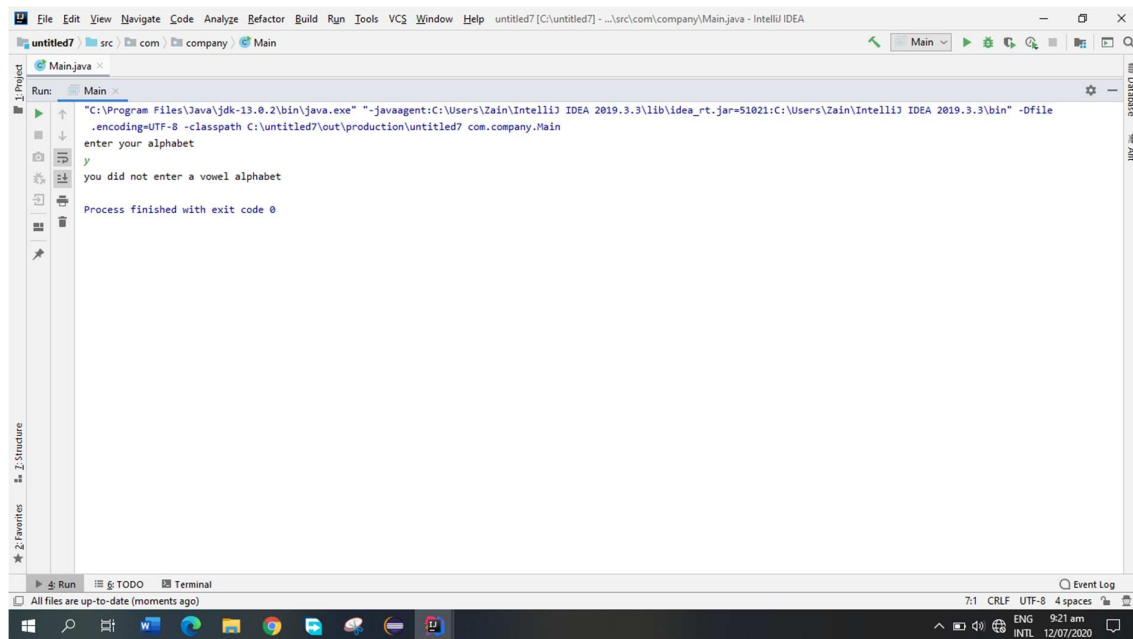
Screenshots of this program are following:


```
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help untitled7 [C:\untitled7] - ...src\com\company\Main.java - IntelliJ IDEA
untitled7 | src | com | company | Main
Main.java
1 package com.company;
2
3 import java.util.Scanner;
4
5 public class Main {
6
7     public static void main(String[] args) {
8         // write your code here
9         Scanner scanner=new Scanner(System.in); // using Scanner to get input from user
10        System.out.println("enter your alphabet");
11        char ch; // used character data type
12        ch= scanner.next().charAt(0);
13        if (ch=='a' || ch=='e' || ch=='i' || ch=='o' || ch=='u' || ch=='A' || ch=='E' || ch=='I' || ch=='O' || ch=='U') // using if-else control structure
14        {
15            System.out.println("you entered a vowel alphabet");
16        }
17        else
18        {
19            System.out.println("you did not enter a vowel alphabet");
20        }
21    }
22 }
23
```

Run | TODO | Terminal | Event Log
All files are up-to-date (5 minutes ago) 23:1 CRLF UTF-8 4 spaces
ENG 9:20 am
INTL 12/07/2020

```
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help untitled7 [C:\untitled7] - ...src\com\company\Main.java - IntelliJ IDEA
untitled7 | src | com | company | Main
Main.java
Run: Main
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Users\Zain\IntelliJ IDEA 2019.3.3\lib\idea_rt.jar=51016:C:\Users\Zain\IntelliJ IDEA 2019.3.3\bin" -Dfile.encoding=UTF-8 -classpath C:\untitled7\out\production\untitled7 com.company.Main
enter your alphabet
i
you entered a vowel alphabet
Process finished with exit code 0
```

Run | TODO | Terminal | Messages | Event Log
Build completed successfully in 2 s 827 ms (moments ago) 8:1 CRLF UTF-8 4 spaces
ENG 9:21 am
INTL 12/07/2020



2nd method:

```
package com.company;

import java.util.Scanner;

public class Main {

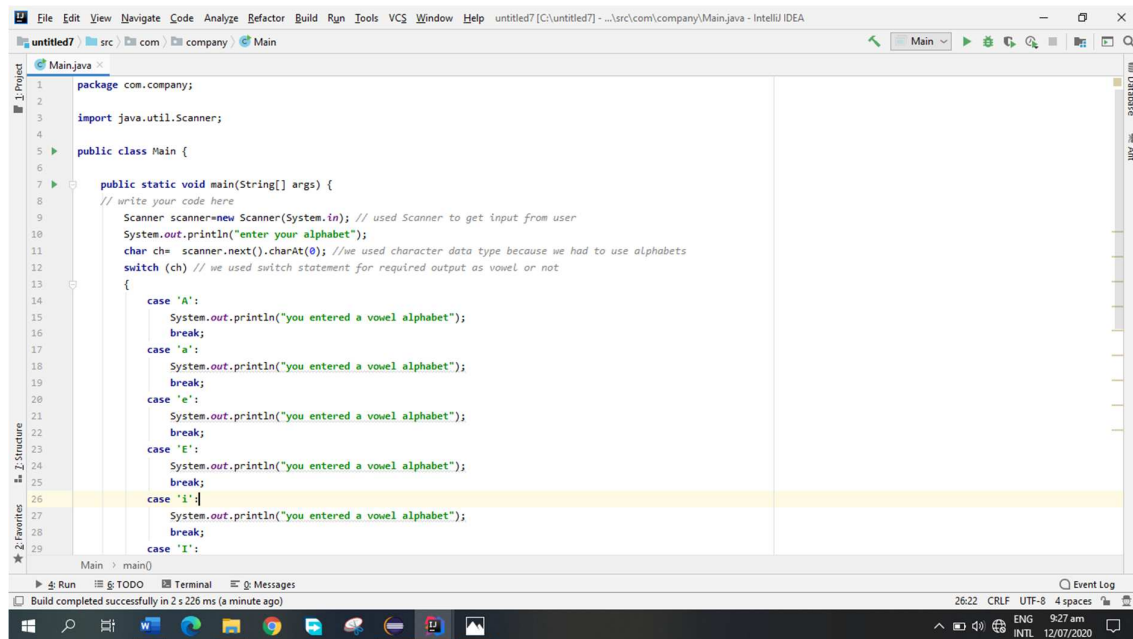
    public static void main(String[] args) {
        // write your code here
        Scanner scanner=new Scanner(System.in); // used Scanner to get input from
        user
        System.out.println("enter your alphabet");
        char ch= scanner.next().charAt(0); //we used character data type because
        we had to use alphabets
        switch (ch) // we used switch statement for required output as vowel or
        not
        {
            case 'A':
                System.out.println("you entered a vowel alphabet");
                break;
            case 'a':
                System.out.println("you entered a vowel alphabet");
                break;
            case 'e':
                System.out.println("you entered a vowel alphabet");
                break;
            case 'E':
                System.out.println("you entered a vowel alphabet");
                break;
            case 'i':
                System.out.println("you entered a vowel alphabet");
                break;
        }
    }
}
```

```

        break;
    case 'I':
        System.out.println("you entered a vowel alphabet");
        break;
    case 'o':
        System.out.println("you entered a vowel alphabet");
        break;
    case 'O':
        System.out.println("you entered a vowel alphabet");
        break;
    case 'u':
        System.out.println("you entered a vowel alphabet");
        break;
    case 'U':
        System.out.println("you entered a vowel alphabet");
        break;
    default:
        System.out.println("you did not enter a vowel alphabet");
        break;
    }
}
}
}

```

Screenshots of this program are following:



```
24     System.out.println("you entered a vowel alphabet");
25     break;
26     case 'i':
27         System.out.println("you entered a vowel alphabet");
28         break;
29     case 'I':
30         System.out.println("you entered a vowel alphabet");
31         break;
32     case 'o':
33         System.out.println("you entered a vowel alphabet");
34         break;
35     case 'O':
36         System.out.println("you entered a vowel alphabet");
37         break;
38     case 'u':
39         System.out.println("you entered a vowel alphabet");
40         break;
41     case 'U':
42         System.out.println("you entered a vowel alphabet");
43         break;
44     default:
45         System.out.println("you did not enter a vowel alphabet");
46         break;
47 }
48
49 }
50
51 }
```

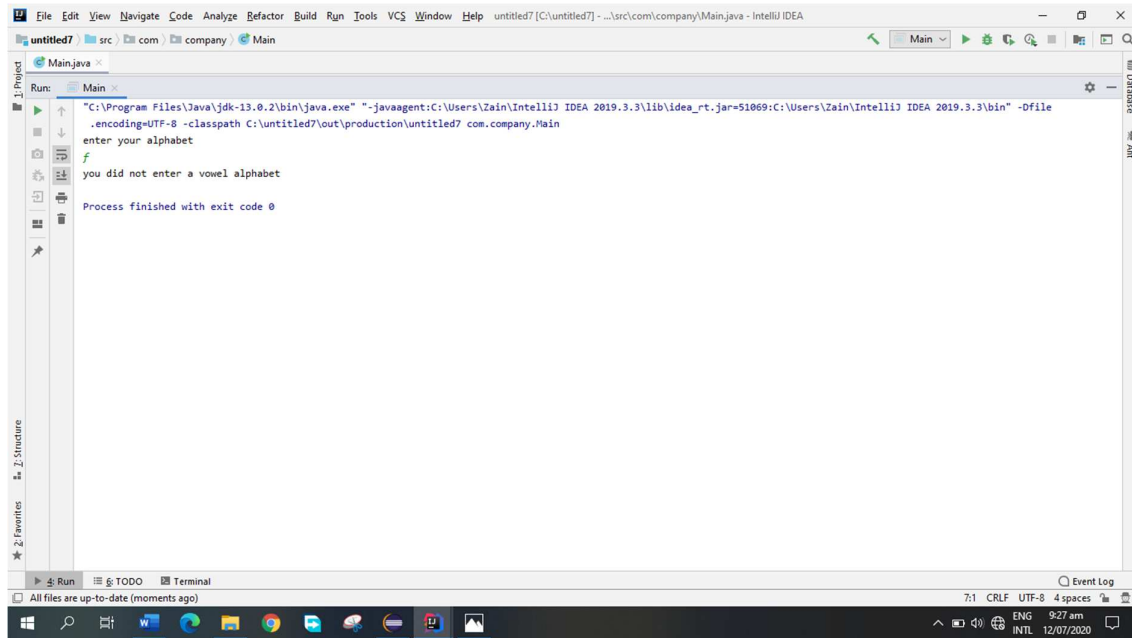
Build completed successfully in 2 s 226 ms (2 minutes ago)

51:1 CRLF UTF-8 4 spaces
ENG 9:27 am
INTL 12/07/2020

```
Run: Main
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Users\Zain\IntelliJ IDEA 2019.3.3\lib\idea_rt.jar=51064:C:\Users\Zain\IntelliJ IDEA 2019.3.3\bin" -Dfile.encoding=UTF-8 -classpath C:\untitled7\out\production\untitled7 com.company.Main
enter your alphabet
u
you entered a vowel alphabet
Process finished with exit code 0
```

All files are up-to-date (moments ago)

7:1 CRLF UTF-8 4 spaces
ENG 9:27 am
INTL 12/07/2020



END OF QUESTION #4

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

ANS=>

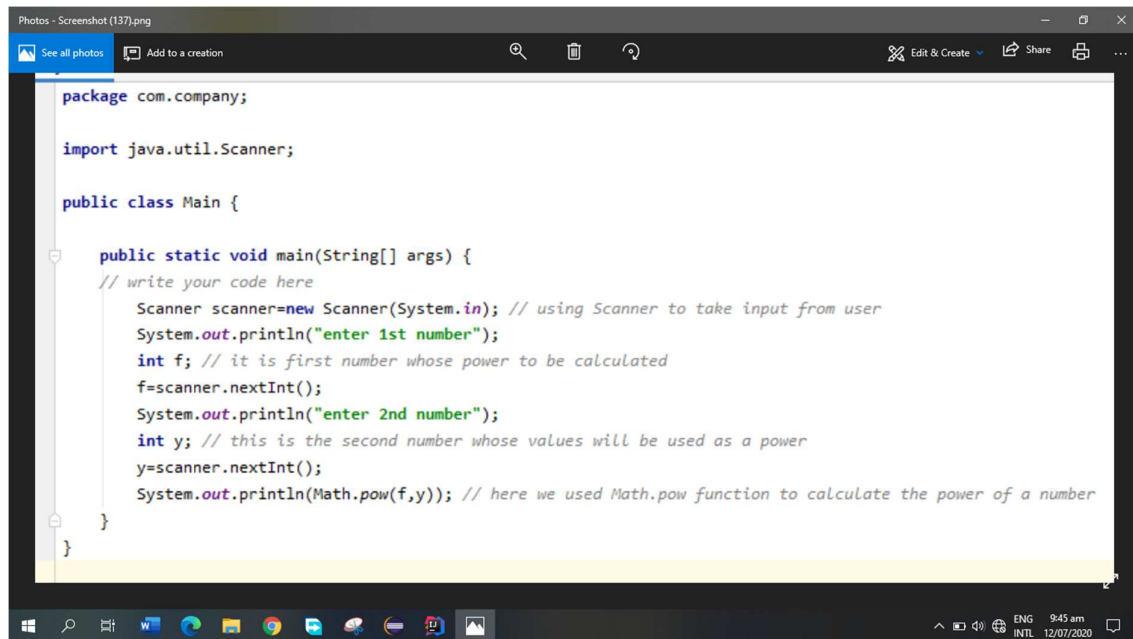
```
package com.company;
```

```
import java.util.Scanner;
```

```
public class Main {
```

```
    public static void main(String[] args) {  
        // write your code here  
        Scanner scanner=new Scanner(System.in); // using Scanner to take input  
        from user  
        System.out.println("enter 1st number");  
        int f; // it is first number whose power to be calculated  
        f=scanner.nextInt();  
        System.out.println("enter 2nd number");  
        int y; // this is the second number whose values will be used as a power  
        y=scanner.nextInt();  
        System.out.println(Math.pow(f,y)); // here we used Math.pow function to  
        calculate the power of a number  
    }  
}
```

screenshots of the program:



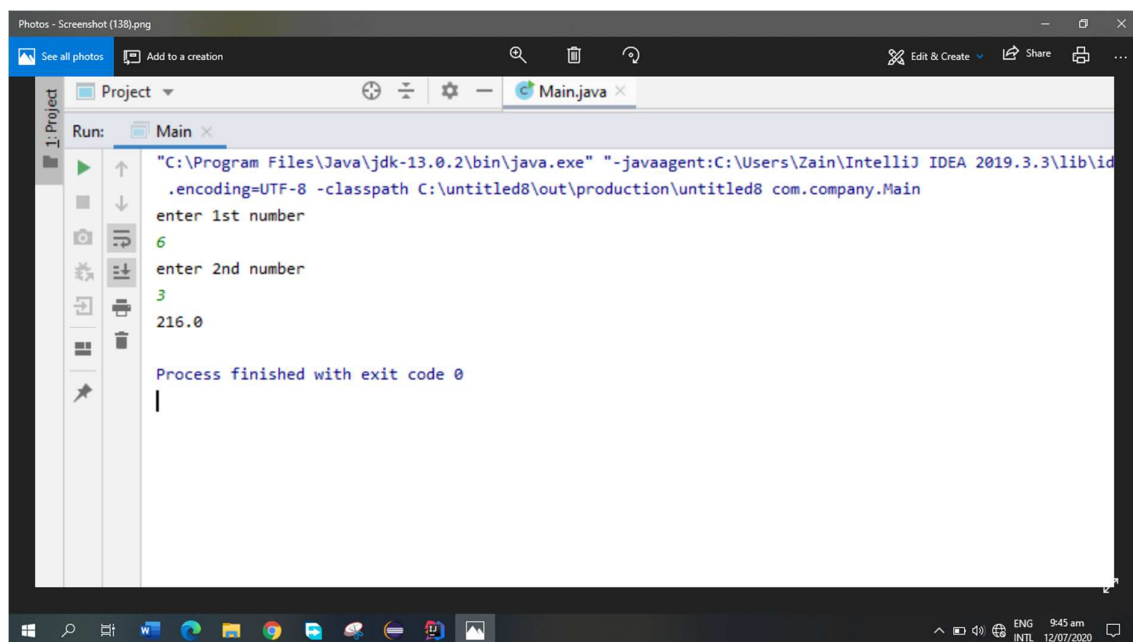
```
package com.company;

import java.util.Scanner;

public class Main {

    public static void main(String[] args) {
        // write your code here
        Scanner scanner=new Scanner(System.in); // using Scanner to take input from user
        System.out.println("enter 1st number");
        int f; // it is first number whose power to be calculated
        f=scanner.nextInt();
        System.out.println("enter 2nd number");
        int y; // this is the second number whose values will be used as a power
        y=scanner.nextInt();
        System.out.println(Math.pow(f,y)); // here we used Math.pow function to calculate the power of a number
    }
}
```

Output of the program:



```
Run: Main x
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Users\Zain\IntelliJ IDEA 2019.3.3\lib\id
.encoding=UTF-8 -classpath C:\untitled8\out\production\untitled8 com.company.Main
enter 1st number
6
enter 2nd number
3
216.0

Process finished with exit code 0
```

END OF QUESTION #5.