```java
import java.lang.*;
import java.io.*;
import java.util.*;
class Number
{
int num,c;
Scanner s=new Scanner(System.in);

void even()
{
        System.out.println("\n'Even Numbers' are integers that are exactly divisible by 2.
Whereas, an 'Odd number' cannot be exactly divided by 2.\n");
        System.out.println("\n\nEnter a number to check it is even or not:\n");
        num=s.nextInt();
        if(num%2==0)
        System.out.println(num+" is even\n");
        else
        System.out.println(num+" is odd\n");
        do
        {
                System.out.println("\n1.Explanation");
                System.out.println("2.Return to Main Choice\n");
                c=s.nextInt();
                switch(c)
                {
                        case 1:
                                if(num%2==0)
                                System.out.println(num+" is divisible by 2, Hence "+num+" is
even number\n");

                                else
                                System.out.println(num+" is not divisible by 2, Hence "+num+"
is odd number\n");
                                break;
                        default: System.out.print("");
                }
        }while(c<=1);
}

void prime()
{
        int flag = 0;
        System.out.println("\n'Prime number' is a positive integer that is divisible only by 1
and itself.\n\n'Composite Number' is a number  which has more than two factors.\n");
        System.out.println("\n\nEnter an integer to check whether it is prime or
composite:\n");
        num=s.nextInt();
        for(int i = 2; i<=num/ 2; i++)
        {
                if (num%i==0)
                {
                        flag = 1;
                        break;
                }
        }
        if(num==1)
```

```java
        {
                System.out.println("1 is neither prime nor composite");
        }
        else
        {
                if (flag == 0)
                System.out.println(num+" is a prime number");
                else
                System.out.println(num+" is a composite number");
        }
        do
        {
                System.out.println("\n1.Explanation");
                System.out.println("2.Return to Main Choice\n");
                c=s.nextInt();
                switch(c)
                {
                        case 1:
                                if(num==1)
        {
                System.out.println("\n1 has only one positive factor i.e. no.1 only. Hence 1 is
neither prime nor composite. It forms its own special category as a 'unit'\n");
        }
        else
        {
                if (flag == 0)
                System.out.println(num+" has no factors other than 1 and itself. So It is a
prime number");
                else
                System.out.println(num+" has more than two factors. So It is a composite
number");
        }

                        default: System.out.print("");
                }
        }while(c<=1);

}

void table()
{
        int mul;
        System.out.println("\nEnter a number to print it's Multiplication Table:\n");
        num=s.nextInt();
        System.out.println("\nEnter the number of multiples of the table to be printed:\n");
        mul=s.nextInt();
        System.out.println("\n");
        for(int i=1;i<=mul;i++)
        {
                int temp=num*i;
                System.out.println(num+"*"+i+"="+temp);
        }
}

void armstrong()
```

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{
        int d, rem, result=0;
        System.out.println("'\nArmstrong number' is number whose sum of cubes of each
digit is equal to the number itself.\n");
        System.out.println("\n\nEnter a three-digit integer:\n");
        num=s.nextInt();
        d=num;
        while(d!=0)
        {
                rem=d % 10;
                result+=rem*rem*rem;
                d/=10;
        }
        if (result == num)
        System.out.println(num+" is an Armstrong number");
        else
        System.out.println(num+" is not an Armstrong number");
        do
        {
                System.out.println("\n1.Explanation");
                System.out.println("2.Return to Main Choice\n");
                c=s.nextInt();
                switch(c)
                {
                        case 1:
                        if (result == num)
                System.out.println("\nLet us take "+num+" and calculate the cube of each
digit.\nNow add the cubes, Then we get "+num+".\nHence The given number is an
Armstrong number");
                        else
                System.out.println("\nLet us take "+num+" and calculate the cube each
digit.\nNow add the cubes, Then we do not get "+num+".\nHence The given number is not
an Armstrong number");
                        break;
                        default: System.out.print("");
                }
        }while(c<=1);
}

void perfect()
{
        int i, sum = 0;
        System.out.println("\n'Perfect number' is a positive integer which is equal to the sum
of its proper positive divisors.\n");
        System.out.println("\n\nEnter any number to check perfect number:\n");
        num=s.nextInt();
        for(i=1;i<=num/2;i++)
        {
                if(num%i == 0)
                {
                        sum += i;
                }
        }
        if(sum == num)
        {
```

```java
                System.out.println(num+" is a perfect number");
        }
        else
        {
                System.out.println(num+" is not a perfect number");
        }
}

void palindrome()
{
        int rev=0, rem, real;
        System.out.println("\nAn integer is a 'Palindrome' if the reverse of that number is
equal to the original number.\n");
        System.out.println("\n\nEnter an integer: \n");
        num=s.nextInt();
        real= num;
        while(num!=0)
        {
                rem = num%10;
                rev = rev* 10 + rem;
                num /= 10;
        }

        if (real == rev)
        System.out.println(real+" is a palindrome");
        else
        System.out.println(real+" is not a palindrome");
}

void factor()
{
        System.out.println("\nFactor is a number that divides another number or expression
evenly—i.e., with no remainder\n");
        System.out.println("\n\nEnter an integer to print its factors:\n");
        num=s.nextInt();
        System.out.println("\nFactors of "+num+" are: \n");
        for (int i = 1;i <=num;i++)
        {
                if (num % i == 0)
                {
                        System.out.println(i);
                }
        }
}

void divisibility()
{
        System.out.println("\nEnter a number you want to divide:");
        int item=s.nextInt();
        System.out.println("\nEnter a number to check whether it is divisible by
"+item+":\n");
        num=s.nextInt();
        if(num%item==0)
        System.out.println(num+" is divisible by "+item);
        else
```

```java
                System.out.println(num+" is not divisible by "+item);
        }
}
class Numberfun
{
        public static void main(String args[])
        {
        Number n=new Number();
        Scanner s=new Scanner(System.in);
        int ch;
        do
        {
                System.out.println("\n\n1.Even or Odd");
                System.out.println("2.Prime or Composite");
                System.out.println("3.Multiplication Table");
                System.out.println("4.Armstrong or not");
                System.out.println("5.Perfect or not");
                System.out.println("6.Palindrome or not");
                System.out.println("7.Factors");
                System.out.println("8.Divisibility");
                System.out.println("9.Exit\n\n");
                ch=s.nextInt();
                switch(ch)
                {
                        case 1: n.even();
                        break;
                        case 2: n.prime();
                        break;
                        case 3: n.table();
                        break;
                        case 4: n.armstrong();
                        break;
                        case 5: n.perfect();
                        break;
                        case 6: n.palindrome();
                        break;
                        case 7: n.factor();
                        break;
                        case 8: n.divisibility();
                        break;
                        case 9: System.exit(0);
                        default: System.out.println("\nInvalid Choice\n");
                }
        }while(ch<=9);
        }
}
```