Problem 1: Happy Number:

Solution:

```
import java.util.HashSet;//
import java.util.Set;//The above two lines import necessary classes for using set
and hashset

public class HappyNumber { //This is a the main class

    public static boolean isHappy(int n) { //This method takes integer as input
and returns boolean
        Set<Integer> seen = new HashSet<>(); //Here we define hashset named seen
to keep track of number encountered
        while (n != 1 && !seen.contains(n)) { //Starts a while loop that
continues until either n becomes 1 indicating it's a happy number or n is
encountered in the seen set indicating the process has entered a cycle.
            seen.add(n); //Adds the current value of n to the set of seen numbers
            n = sumOfSquares(n); //Updates n to be the sum of the squares of its
digits using the sumOfSquares method.
        }
        return n == 1;
    }

    private static int sumOfSquares(int n) { //Defines a private method named
sumOfSquares that takes an integer n as a parameter and returns an integer.
        int sum = 0; //Initializes a variable sum to 0 to accumulate the sum of
squares of digits.
        while (n > 0) { //Starts a while loop that continues until n becomes 0.
            int digit = n % 10; //Extracts the last digit of n.
            sum += digit * digit; //Adds the square of the digit to the sum.
            n /= 10; //Updates n to remove the last digit.
        }
        return sum; //Returns the final sum of squares.
    }

    public static void main(String[] args) {
        int number = 19; //This is the number that i am putting in . We can
change this
        System.out.println(isHappy(number));//Creates an example integer (number)
and prints the result of the isHappy method for that number.
    }
}
```

Q.2 Palindrome check

Solution:

```
class PalindromeExample{
 public static void main(String args[]){
  int r,sum=0,temp;
  int n=454;//It is the number variable to be checked for palindrome

  temp=n;
  while(n>0){    //here we will run while loop to reverse the number
   r=n%10;  //getting remainder
   sum=(sum*10)+r;    //store sum in a var sum
   n=n/10;    //take off last digit
  }
  if(temp==sum)    //If original number stored in var is equal to the reverse of
number
   System.out.println("palindrome number ");  //prints if true
  else
   System.out.println("not palindrome");    //gets printed if false
}
}
```