```
1   public class CreditCard {
2     public boolean verify(String num) {
3       int sum = 0; // initialize sum variable
4
5       for (int i = num.length()-1; i >= 0; i --) { // for all of the characers in num
6         if (num.length()%2 == i%2) // if placement is even
7           sum += Integer.parseInt(num.substring(i,i+1))/5 + Integer.parseInt(num.
    substring(i,i+1))*2%10; // add double tens place and double ones place of that one
    digit
8         else // if placement is odd
9           sum += Integer.parseInt(num.substring(i,i+1)); // just add digit to sum
10      }
11
12      return sum%10 == 0; // valid if divisible by 10
13    }
14
15
16    public int findType(String num) {
17      if (num.length() < 4) // if there are no first 4 digits, then throw it out
18        return 0;
19      if (num.substring(0,1).equals("4")) // if first digit is 4, Visa
20        return 2;
21      if (Integer.parseInt(num.substring(0,2)) > 50 && Integer.parseInt(num.substring
    (0,2)) < 56) // if first digits are 51-55, MC
22        return 1;
23      if (num.substring(0,2).equals("34") || num.substring(0,2).equals("37")) // if
    first two digits are 34, 37, AmEx
24        return 3;
25      if (num.substring(0,2).equals("36") || num.substring(0,2).equals("38")) // if
    they are 36 or 38, Diner thing
26        return 5;
27      if (Integer.parseInt(num.substring(0,3)) > 299 && Integer.parseInt(num.
    substring(0,3)) < 306) // if first 3 digits are between 300 and 305, also Diner
    thing
28        return 5;
29      if (num.substring(0,4).equals("6011")) // if starts with 6011, discover
30        return 4;
31      return 0; // otherwise, other
32    }
33
34
35    public String randomNumber(int type) {
36      String randNum;
37      switch (type) { // initialises the output so that it starts with the proper
    characters
38        case 1:
39          randNum = Integer.toString((int)(Math.random()*5+51));
40          break;
41        case 2:
42          randNum = "4";
43          break;
44        case 3:
45          randNum = Integer.toString((int)(Math.random()*2)*3+34);
46          break;
47        case 4:
48          randNum = "6011";
49          break;
50        case 5:
51          if (Math.random()<.5)
52            randNum = Integer.toString((int)(Math.random()*2)*2+36);
53          else
54            randNum = Integer.toString((int)((Math.random()*2)*6+300));
55          break;
56        default:
57          randNum = "";
58      }
59
60      for (int i = randNum.length(); i < 15; i ++) // puts on random numbers until
    length is 15
61        randNum += Integer.toString((int)(Math.random()*10));
62
63      for (int i = 0; i < 10; i ++) // checks 0-9 to see which final digit will make
    it valid (there is always exactly one)
64        if (verify(randNum + i))
65          return randNum + i;
66
67      return "ERROR"; // if, somehow, it does not find it, then math is broken so
    return "ERROR"
68    }
69  }
```