```java
import java.util.Scanner;
import java.lang.Math;
import java.util.InputMismatchException;
class Calculator
 {
    int add(int no1,int no2)
    {
        return no1+no2;
    }
    double add(double no1,double no2)
    {
        return no1+no2;
    }
    float add(float no1,float no2)
    {
        return no1+no2;
    }
    int sub(int no1,int no2)
    {
        return no1-no2;
    }
    double sub(double no1,double no2)
    {
        return no1-no2;
    }
    float sub(float no1,float no2)
    {
        return no1-no2;
    }
```

```
30      int mul(int no1,int no2)
31      {
32          return no1*no2;
33      }
34      double mul(double no1,double no2)
35      {
36          return no1*no2;
37      }
38      float mul(float no1,float no2)
39      {
40          return no1*no2;
41      }
42      int div(int no1,int no2)
43      {
44          return no1/no2;
45      }
46      double div(double no1,double no2)
47      {
48          return no1/no2;
49      }
50      float div(float no1,float no2)
51      {
52          return no1/no2;
53      }
54      long power(int no1,int no2) throws Exception
55      {
56        if(no1<0 || no2<0)
57        {
58            throw new Exception("no1 or no2 can't be negative");
```

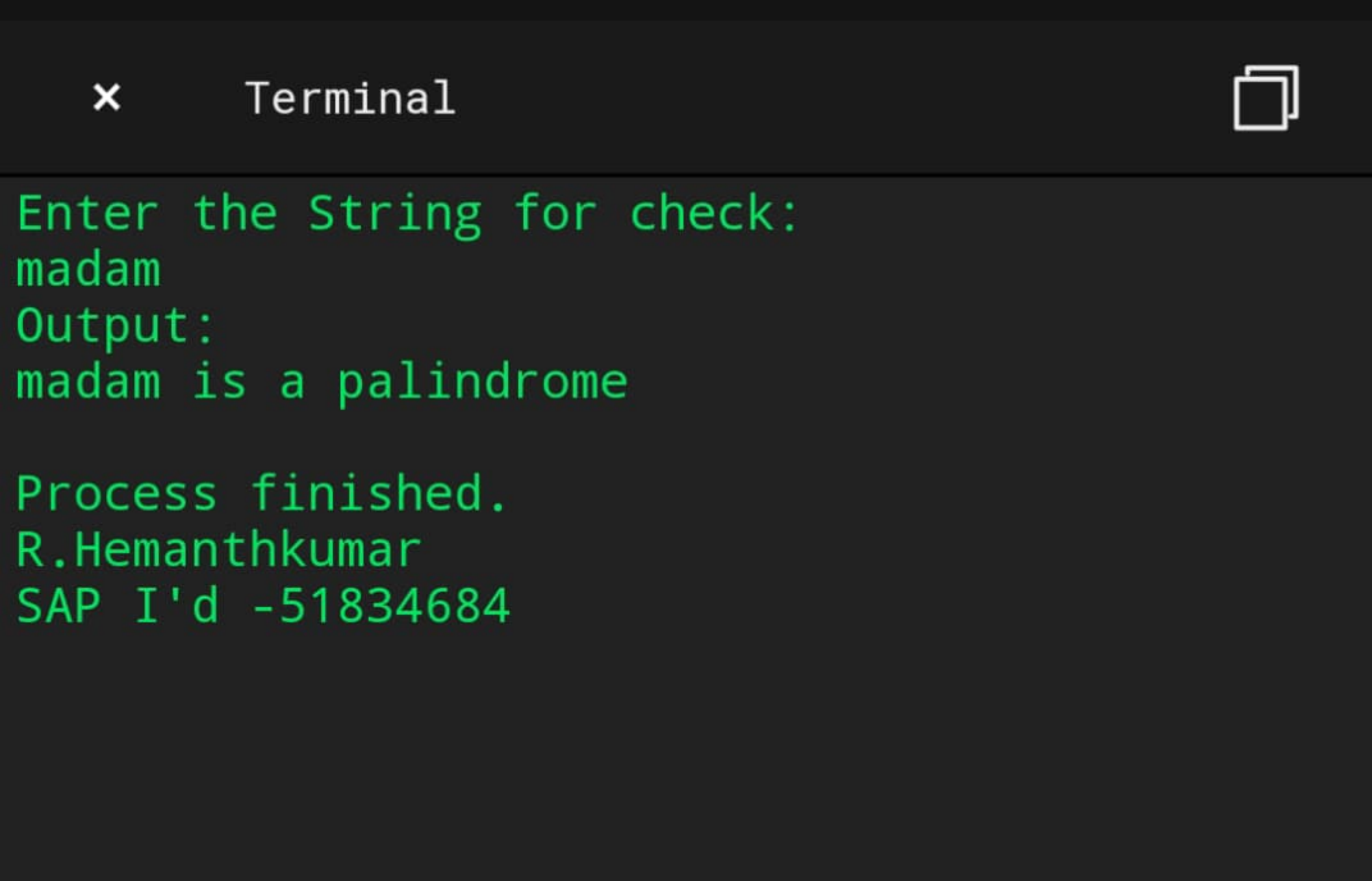
```
59        }
60        if(no1==0 || no2==0)
61        {
62            throw new Exception("no1 or no2 can't be zero");
63        }
64        return (long)Math.pow(no1,no2);
65      }
66  }
67  class Solution
68  {
69     public static void main(String args[])
70     {
71       Scanner sc=new Scanner(System.in);
72       Calculator c=new Calculator();
73      try
74      {
75       while(true)
76       {
77
78         System.out.println("Choose your option\n1.add\n2.subtract\n3.multiply\n4.Division\n5.power\n6.e
79         int option=sc.nextInt();
80         switch(option)
81         {
82           case 1 :
83             System.out.println("Enter first number : ");
84             double first=sc.nextInt();
85             System.out.println("Enter second number : ");
86             double second=sc.nextInt();
87             System.out.println(first+"+"+second+"="+c.add(first,second));
```

```
88          break;
89        case 2 :
90          System.out.println("Enter first number : ");
91          first=sc.nextInt();
92          System.out.println("Enter second number : ");
93          second=sc.nextInt();
94          System.out.println(first+"-"+second+"="+c.sub(first,second));
95          break;
96        case 3 :
97          System.out.println("Enter first number : ");
98          first=sc.nextInt();
99          System.out.println("Enter second number : ");
100         second=sc.nextInt();
101         if(first==0 && second==0)
102         {
103           throw new Exception("Both numbers cannot be 0 while multiply");
104         }
105         System.out.println(first+"*"+second+"="+c.mul(first,second));
106         break;
107       case 4 :
108         System.out.println("Enter first number : ");
109         first=sc.nextInt();
110         System.out.println("Enter second number : ");
111         second=sc.nextInt();
112         if(second==0)
113         {
114           throw new Exception("You cannot divide a number with 0");
115         }
116         System.out.println(first+"/"+second+"="+c.div(first,second));
```

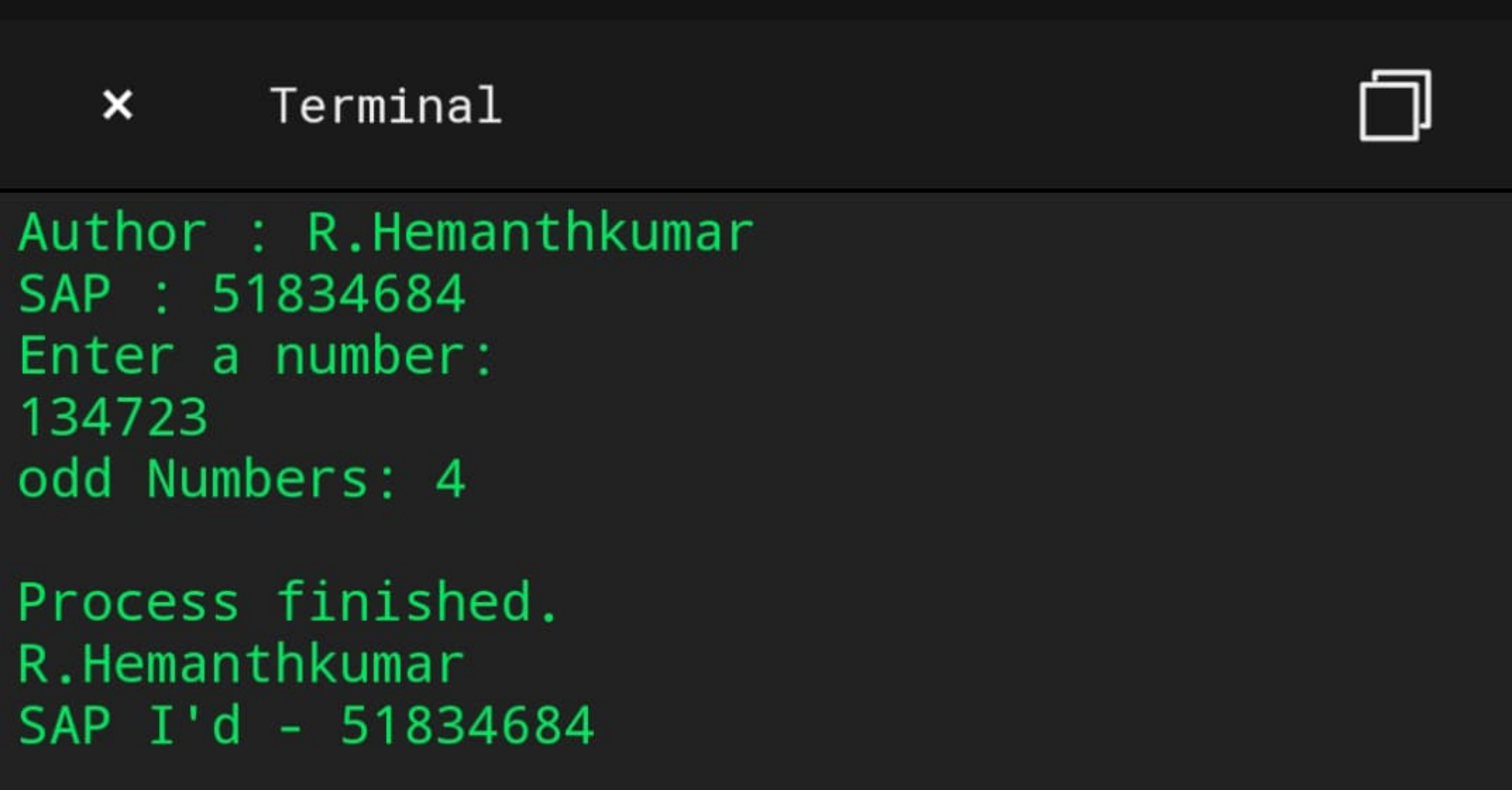
```
117             break;
118           case 5 :
119             System.out.println("Enter the base number : ");
120             int base=sc.nextInt();
121             System.out.println("Enter the exponent : ");
122             int exp=sc.nextInt();
123             System.out.println(c.power(base,exp));
124             break;
125           case 6 :
126             System.exit(0);
127           default :
128             System.out.println("Invalid input");
129         }
130       }
131     }
132     catch(InputMismatchException i)
133     {
134       System.out.println("Invalid input");
135     }
136     catch(ArithmeticException ae)
137     {
138       System.out.println(ae.getMessage());
139     }
140     catch(Exception e)
141     {
142       System.out.println(e.getMessage());
143     }
144   }
145 }
```

```
Terminal

Choose your option
1.add
2.subtract
3.multiply
4.Division
5.power
6.exit
Please Enter your Choice:
1
Enter first number :
450
Enter second number :
120
Output:
450.0+120.0=570.0

Choose your option
1.add
2.subtract
3.multiply
4.Division
5.power
6.exit
Please Enter your Choice:
6

Process finished.
R.Hemanthkumar
SAP ID-51834684
```

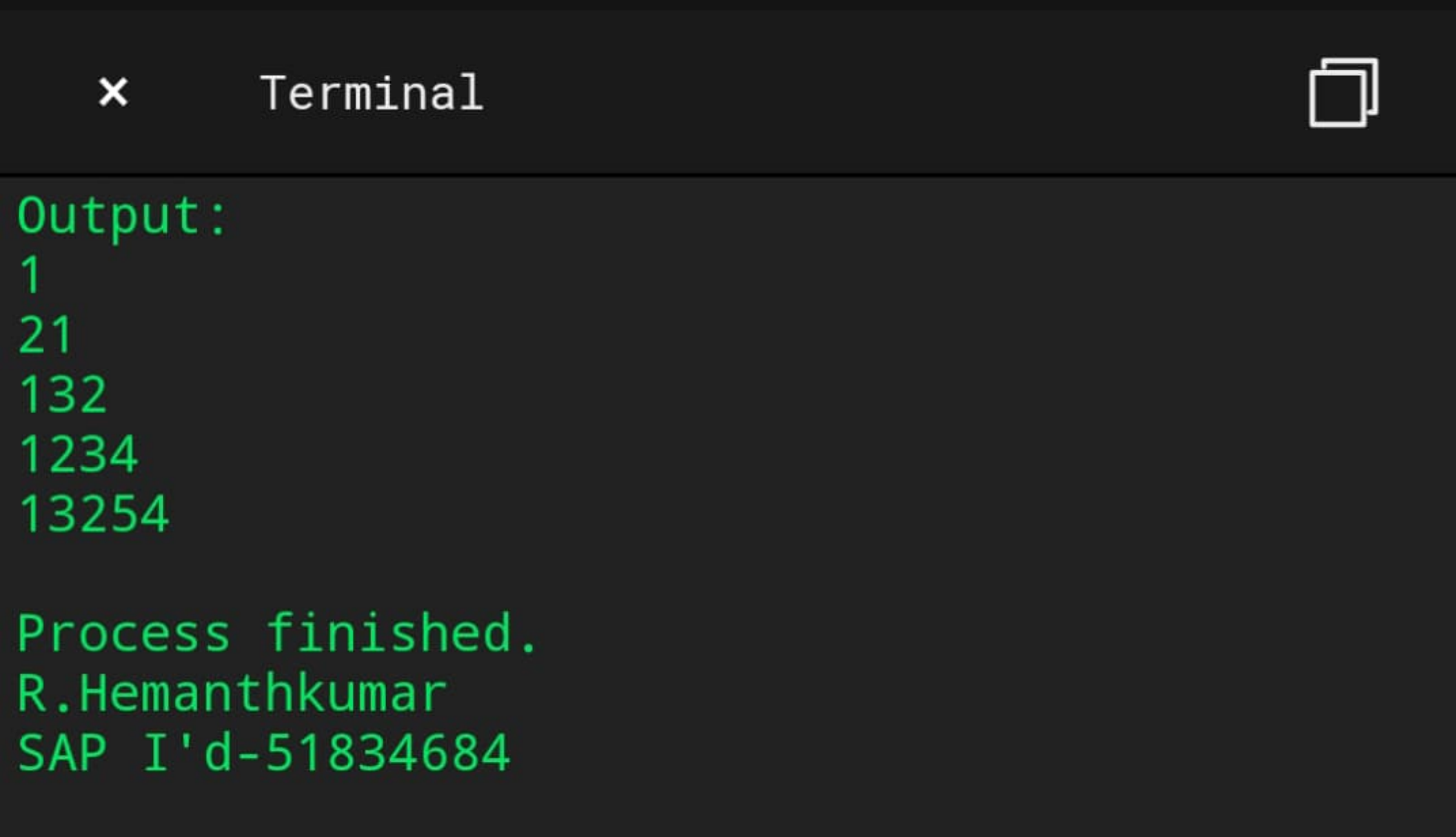
```java
import java.util.Scanner;
class PalindromeCheck
{
 public static boolean isPal(String s)
  {
    if(s.length() == 0 || s.length() == 1)
      return true;
    if(s.charAt(0) == s.charAt(s.length()-1))
       return isPal(s.substring(1, s.length()-1));
      return false;
  }
public static void main(String[]args)
{
  Scanner scanner = new Scanner(System.in);
  System.out.println("Enter the String for check:");
  String string = scanner.nextLine();
  System.out.println("Output: ");
 if(isPal(string))
    System.out.println(string+ " is a palindrome");
 else
  System.out.println(string+ " is not a palindrome");
  }
}
```


Terminal
Enter the String for check:
madam
Output:
madam is a palindrome
Process finished.
R.Hemanthkumar
SAP I'd -51834684

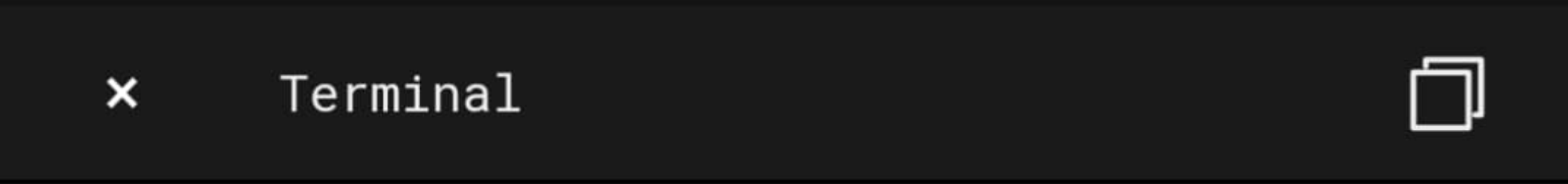
```java
import java.util.*;
public class OddNumbers
{
  public static void main (String[] args)
  {
    System.out.println("Author : R.Hemanthkumar");
    System.out.println("SAP : 51834684");
    int count=0;
    int rem=0 ;
    Scanner sc=new Scanner(System.in);
    System.out.println("Enter a number: ");
    int n= sc.nextInt();
    while(n>0)
    {
      rem=n%10;
      if(rem%2!=0)
      {
        count++;
      }
      n=n/10;
    }
    System.out.println("odd Numbers: "+count);

  }
}
```


Terminal
Author : R.Hemanthkumar
SAP : 51834684
Enter a number:
134723
odd Numbers: 4
Process finished.
R.Hemanthkumar
SAP I'd - 51834684

```java
class Pattern
 {
   public static void main(String args[])
   {
     int a=1;
     System.out.println("Output: ");
     for(int i=1;i<=5;i++)
     {
       for(int j=1;j<=i;j++)
       {
         if(j==1)
         {
           a=j;
         }
         if(i!=4)
         {
           if(i%2==0)
           {
             if(j%2!=0)
             {
               a=j+1;
               System.out.print(a);
               a=a-1;
             }
             else
             {
               System.out.print(a);
             }
           }
           else
           {
             if(j%2==0)
             {
               a=j+1;
               System.out.print(a);
               a=a-1;
             }
             else
             {
               System.out.print(a);
             }
           }
         }
         else
         {
           System.out.print(j);
         }
       }
       System.out.println();
     }
   }
 }
```


Terminal
Output:
1
21
132
1234
13254
Process finished.
R.Hemanthkumar
SAP I'd-51834684

```java
class BubbleSort
{
    public static void main (String[] args)
    {
        int a[] = {16, 19, 11, 15, 10, 12, 14};
        for(int j = 0; j<a.length; j++)
        {
            boolean swapped = false;
            int i = 0;
            while(i<7-1)
            {
                if (a[i] > a[i+1])
                {
                    int temp = a[i];
                    a[i] = a[i+1];
                    a[i+1] = temp;
                    swapped = true;
                }
                i++;
            }
            if (!swapped)
                break;
        }
        System.out.println("After Bubble Sorting: ");
        for(int x : a)
        {
            System.out.print(x+" ");
        }
    }
}
```


Terminal
After Bubble Sorting:
10 11 12 14 15 16 19
Process finished.
R.Hemanthkumar
SAP ID-51834684