

1. Write a recursive java method to evaluate if an integer is an odd or even number and print out a message accordingly. Note that you are not allowed to use any java built-in method other than common operations such as minus, plus, etc. **[10 points]**

```
static void checkEvenOdd(int num) {  
    // your implementation  
    // print out "The number is even." or "The number is odd"  
}
```

2. Write a java program that prompts the user to enter a decimal number and displays its hex equivalent. You need to write a recursive method that converts a decimal number into a hex number as a string. **[5 points]**
3. Using the two arrays shown below, write a program that prompts the user to enter an integer between 1 and 12 and then displays the months and its number of days corresponding to the integer entered. Your program should print "wrong number" if the user enters a wrong number by catching *ArrayIndexOutOfBoundsException*. **[10 points]**

```
String[] months = {"January", "February", "March", "April", "May", "June", "July", "August",  
"September", "October", "November", "December"};  
int[] dom = {31, 28, 31, 30, 31, 30, 31, 31, 30, 31, 30, 31};
```

4. Write a java program that prompts user to enter an integer and then prints out the addition (sum) of all digits of the number by calling a recursive function. You need to (1) develop the recursive function; (2) use try-catch exception handling to ask user to enter again if his/her input is not valid, for instance a string or float point number. **[10 points]**
5. Use recursion to write a java method to calculate the power. **[5 points]**

```
static long calPower(int x, int n) {  
    // your implementation here to return 'x' to the power of 'n', i.e. x^n.  
}
```