

Assignment 01

2/09/2010

Choose 4 exercises (at least one from: 1-3, 4-5, 8-10), 6 and 7 are mandatory.

Please create a package for each point and name it as follows `p<Number>` (i.e. for the first point, the package is: `p1`) and don't forget the Java Code Conventions.

1. Write a program that reads two integers and prints the addition, subtraction and multiplication.
2. Write a program that reads an integer and determines and prints whether it is odd or even.
3. Write a program that reads in two integers and determines and prints if the first is a multiple of the second.
4. Write a program that inputs a five-digit integer, separates the integer into its individual digits and prints the digits separated from one another by three spaces each. [Hint: Use the integer division and modulus operators; the power function is `Math.pow(double a, double b)` which means a^b .] For example, if the user types in 42339, the program should print:

```
4 2 3 3 9
```

5. Write a program that reads in the size of the side of a square and then prints a hollow square of that size out of asterisks and blanks. Your program should work for squares of all side sizes between 1 and 7. For example, if your program reads a size of 4, it should print

```
* * * *
*      *
*      *
* * * *
```

6. Write a program that asks for integers (9999 to exit), calculates and prints the average. A typical input sequence might be 999 1 15 5 9999 indicating that the average of all the values preceding 9999 is to be calculated. It should print

```
The average is: 255
```

7. The greatest common divisor (GCD) of two integers is the largest integer that evenly divides each of the numbers. Write a function `gcd` that returns the greatest common divisor of two integers.
8. A palindrome is a string that is spelled the same way forwards and backwards. Some examples of palindromes are "radar," "able was i ere i saw elba" and (if blanks are ignored) "a man a plan a canal panama." Write a function `testPalindrome` that returns true if the string stored in the array is a palindrome, and false otherwise. The function should ignore spaces and punctuation in the string.
9. Write a program that reads two strings and determines if the first is a substring of the second. (You have to make your own function).

Example:

The string "fun" is a substring of "this is fundamental"

The string "kids" is not a substring of "the kid serves the food"

The string "kid s" is a substring of "the kid serves the food"

10. Write a program that reads two strings and determines if the first is included in the second. (A string is said to be included in another if all of the characters, with repetitions, are in the second string).

Example:

The string "fun" is included in "this is fundamental"

The string "tables" is included in "the baris closed"

The string "balls" is not included in "thebaris closed" [Because an L is missing]

11. [optional] Write a program that, given an integer n , prints a $n \times n$ matrix having their values ordered as an spiral. An example can be seen in the figure.

	1	2	3	4		1	2	3
$n = 4...$	12	13	14	5	$n = 3...$	7	8	3
	11	16	15	6		6	5	4
	10	9	8	7				