technische universität dortmund

Department of Computer Science
Chair 11 / Algorithm Engineering

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Winter 2011/12

Object-oriented Programming

Exam Sheet No. 1

Date: October 25— Due: November 8

Exam 1.1

Write a program that reads integer numbers from the console until the user enters a non-positive number, and then prints out the number of odd and even numbers the user has entered (excluding the final non-positive number).

Example: If the users enters `5 3 10 17 6 0`, the output shall be: `3 odd and 2 even numbers`

Exam 1.2

Write a program that asks the user for a positive integer n, and then prints the sum $\sum_{i=1}^{n} i$ of all positive integers up to n. If the user enters a non-positive number, the program shall display an error message.

Exam 1.3

Write a program that asks the user for a positive integer n, and then prints a square of size n of stars `'*'`, in which the diagonal is left blank.

Example: For $n = 4$, the output shall look as in the figure below on the left-hand side, and for $n = 7$ as on the right-hand side.

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

Exam 1.4

Write a program that asks the user for two integers n and m, and then prints a table of powers up to the m-th power for the numbers $2, 3, \ldots, n$. Try to nicely format your table.

Example: For $n = 6$ and $m = 4$, a nicely formatted table looks as follows:

```
  n |    n^2    n^3    n^4
----+--------------------
  2 |      4      8     16
  3 |      9     27     81
  4 |     16     64    256
  5 |     25    125    625
  6 |     36    216   1296
```