## Solution 1: Hello World!

Kattis id: hello
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The problem does not have any input and the output should be the "secret message."

### 1.1 Solution

The trick is to realize that the secret message is "Hello World!" and not to forget std: :endl or $\backslash \mathrm{n}$ if you are using $\mathrm{C}++$ or C .

### 1.2 Pseudo code

Using the algorithm-environment one can typeset pseudo-code fairly easily with a reasonable result.

Algorithm 1: Hello World solution.
Input: There is no input
Output: The secret message
HelloWorld()
(1) print "Hello World $\backslash \mathrm{n}$ "

# Solution 2: Nonsense example 

Kattis id: no kattis id
Mikael Goldmann
The proble stresses repetition.

### 2.1 Solution

There are many things worth repeating. There are many things worth repeating. There are many things worth repeating. There are many things worth repeating. There are many things worth repeating.

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Definition 2.1.1. Let $\mathbb{Z}$ denote the integers.
Definition 2.1.2. Let $\mathbb{N}=\{n \geq 0 \mid n \in \mathbb{Z}\}$ denote the natural numbers.

### 2.1.1 A Subsection Header

There are many things worth repeating. There are many things worth repeating. There are many things worth repeating. There are many things worth repeating. There are many things worth repeating.

### 2.2 Another Section Header

Repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat.

Repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat, repeat.

Lemma 2.2.1.

$$
\forall x: x \in \mathbb{Z} \Rightarrow x^{2} \in \mathbb{N}
$$

## Theorem 2.2.2.

$$
\forall x: A(x) \Rightarrow B(X)
$$

### 2.3 An Algorithm

Using the algorithm-environment one can typeset pseudo-code fairly easily with a reasonable result.

Algorithm 2: An example of the algorithm-environment.
Input: A non-empty set $U=\left\{u_{1}, u_{2}, \ldots, u_{n}\right\}$ of integers
Output: The largest element and a set $A,|A|=\log n$, con-
taining the second largest element. (If $n=1$, then $A=\emptyset$ ).
$\operatorname{Max} 2(U)$
(1) $\quad$ if $|U|=1$
(2) return $\left(u_{1}, \emptyset\right)$
(3) else if $|U|=2$
(4) if $u_{1}>u_{2}$ then return $\left(u_{1},\left\{u_{2}\right\}\right)$
(5) else return $\left(u_{2},\left\{u_{1}\right\}\right)$
(6) else
(7) $\quad(b, B) \leftarrow \operatorname{Max} 2\left(\left\{u_{i}\right\}_{i=1}^{\lfloor n / 2\rfloor}\right)$
(8) $\quad(c, C) \leftarrow \operatorname{Max} 2\left(\left\{u_{i}\right\}_{i=\lfloor n / 2\rfloor+1}^{n}\right)$
(9) if $b>c$ then return $(b,\{c\} \cup B)$
(10) else return $(c,\{b\} \cup C)$

