

1. Write a function $df :: \mathbf{Int} \rightarrow \mathbf{Int}$ that returns the double factorial of a natural number. The double factorial of n is denoted $n!!$ and is $n(n-2)(n-4)\dots$.
2. Write a function $sumd :: \mathbf{Int} \rightarrow \mathbf{Int}$ that returns the sum of the digits of a natural number.
3. Write a function $dup :: [\mathbf{Int}] \rightarrow [\mathbf{Int}]$ that duplicates each element in a list.
4. Write a function $pal :: \mathbf{String} \rightarrow \mathbf{Bool}$ that tells if a string is a palindrome, ie, if it is equal to its reverse.
5. Write a function $apply2 :: (a \rightarrow a) \rightarrow a \rightarrow a$ that applies a function twice to some parameter.

Sample input 1

```
df 0
df 1
df 2
df 3
df 10
df 11
df 13
```

Sample output 1

```
1
1
2
3
3840
10395
135135
```

Sample input 2

```
sumd 0
sumd 3
sumd 23
sumd 999
sumd 8756
```

Sample output 2

```
0
3
5
27
26
```

Sample input 3

```
dup [1, 2, 3]
dup []
dup [666]
dup [4, 4, 2, 3, 8, 2]
```

Sample output 3

```
[1, 1, 2, 2, 3, 3]
[]
[666, 666]
[4, 4, 4, 4, 2, 2, 3, 3, 8, 8, 2, 2]
```

Sample input 4

```
pal "abcba"
pal "xyzaz"
pal ""
pal "a"
pal "aa"
pal "aba"
pal "abb"
pal "abcdedcbz"
```

Sample output 4

```
True
False
True
True
True
True
False
False
```

Sample input 5

```
apply2 (+ 2.5) 10.5  
apply2 (* 3) 4  
apply2 ("hello " ++) "peter"
```

Sample output 5

```
15.5  
36  
"hello hello peter"
```

Problem information

Author : Jordi Petit

Generation : 2018-04-03 12:30:26

© *Jutge.org*, 2006–2018.

<https://jutge.org>