Function Examples

Hog Contest Rules
• Up to two people submit one entry; Max of one entry per person
• Your score is the number of entries against which you win more than 50.00001% of the time
• Strategies are time-limited
• All strategies must be deterministic, pure functions of the players’ scores
• Winning entries will receive a paltry amount of extra credit
• The real prize: honor and glory
• See website for detailed rules

Hog Contest Winners

Fall 2011 Winners
Keegan Mann
Yan Su & Ziting Li
Brian Prince & Zhenghai Qian
Parker Schuh & Robert Chatham

Fall 2012 Winners
Chenyang Yuan
Joseph Hui

Fall 2013 Winners
Paul Bremeron
Sam Kumer & Kangshik Lee
Kevin Chen

Fall 2014 Winners
Alan Tong & Elaine Zhao
Zheyang Zheng
Adem Robert Villarino & Jonny Guo
Zhen Qin & Dian Chen
Zisheng Tai & Yuhu Li

Fall 2015 Winners
Sinho Chewi & Alexander Nguyen Tran
Zhaoxi Li
Stella Tao and Yao Ge

Fall 2016 Winners
Michael McDonald & Tianrui Chen
Andrej Kassiantchouk
Benjamin Krieges

Fall 2017 Winners
Alex Yu and Tanmay Khattar
James Li
Justin Yokota

Spring 2015 Winners
Eric James McHugh
Zijie Dong
Xuhui Zhou

Fall 2018 Winners
Rahul Arora
Jonathan Bodine
Sumer Kohli and Neelsh Ramachandran

Spring 2016 Winners
Michael McDonald and Tianrui Chen

Fall 2019 Winners
Cindy Jin and Jonathan Lee
Amy Patino and Christian Vasquez
Avane Choudhury and Jenna Nen
Michelle Lee and Nicholas Chew

Currying

Function Currying

```python
def make_adder(n):
    return lambda k: n + k

>>> make_adder(2)(3)
5
```

There’s a general relationship between these functions

Curry: Transform a multi-argument function into a single-argument, higher-order function

Decorators

Function Decorators

```python
@trace1
def triple(x):
    return 3 * x
def triple(x):
    return 3 * x
```
Review

What Would Python Display?

The print function returns None. It also displays its arguments (separated by spaces) when it is called.

```
def delay(arg):
    return arg
```

```
def g():
    return arg
    return g
```

```
print(print(5))
print(delay(print(5)))(4)
```

```
delay(delay)(6)
```

```
print(5)
```

```
print(print(5))
```

```
delay(print)(4)
```

```
terror(one)(two)(three)
```

```
terror(one)(two)(four)
```

```
terror(one)(three)(four)
```

```
print(5)
```

```
print(print(5))
```

```
print(5)
```

```
5
```

```
6
```

```
None
```

```
delay(6)
```

```
5
```

```
5
```

```
5
```

```
5
```

```
5
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```

What Would Python Print?

The print function returns None. It also displays its arguments (separated by spaces) when it is called.

```
from operator import add, mul

def square(x):
    return mul(x, x)
```

```
Names in nested def statements can refer to their enclosing scope
```

```
A function that always returns the identity function
```

```
A name evaluates to the value bound to that name in the earliest frame of the current environment in which that name is found.
```

Implementing Functions

Implementing a Function

```
def remove(n, digit):
    """Return all digits of non-negative N that are not DIGIT, for some non-negative DIGIT less than 10.
    >>> remove(231, 3)
    21
    >>> remove(243132, 2)
    4313
    """
    kept, digits = 0, 0
    while n > 0:
        n, last = n // 10, n % 10
        if last != digit:
            kept = kept + last
        digits = digits + 1
    return kept * 10 ** (digits-1)
```

Interactive Output

Input

```
remove(231, 3)
```

```
Output
```

```
21
```

```
remove(243132, 2)
```

```
Output
```

```
4313
```

Implementing a Function

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Interactive Output

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remove(231, 3)
```

```
Output
```

```
21
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```
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```

```
Output
```

```
4313
```