Iteration

Announcements

Office Hours: You Should Go!

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You are not alone!

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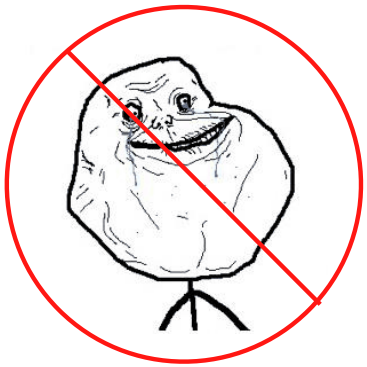

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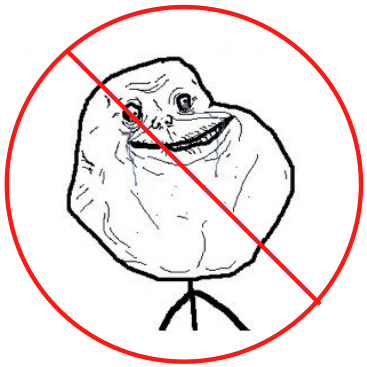

http://cs61a.org/office-hours.html

Iteration Example: Fibonacci Numbers

The Fibonacci Sequence

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0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987

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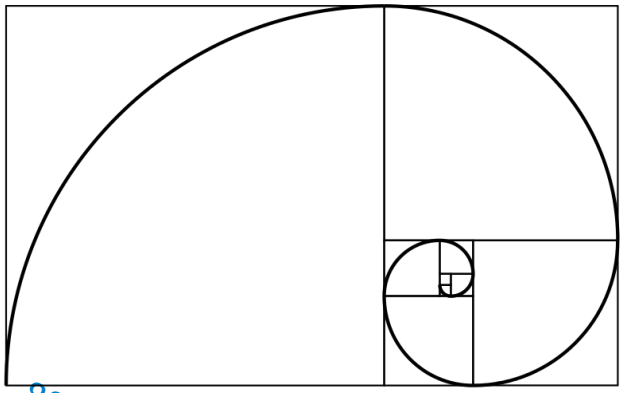

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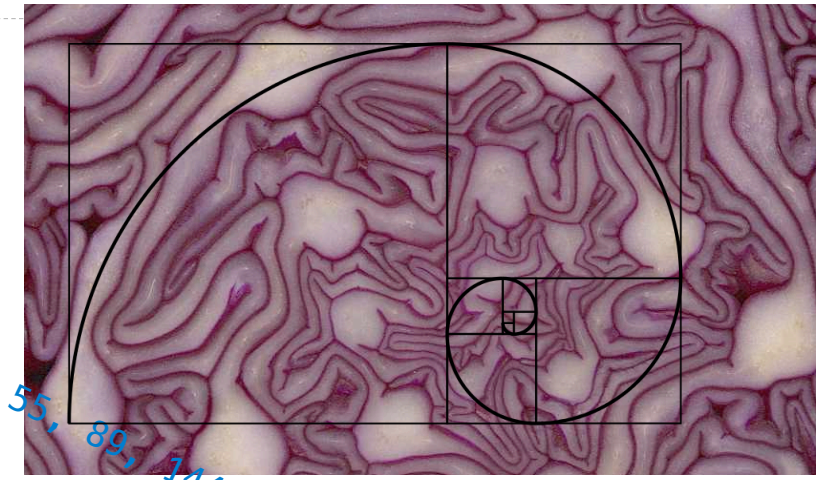

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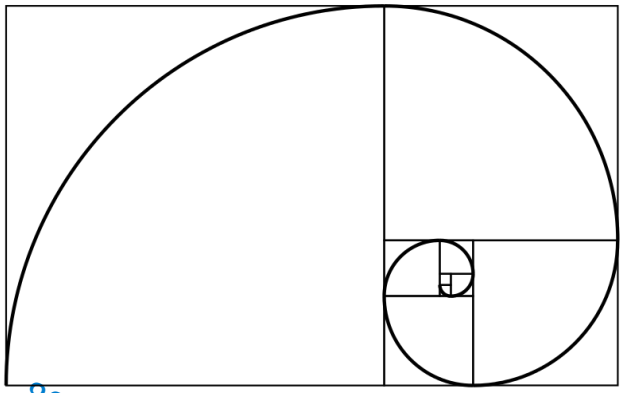

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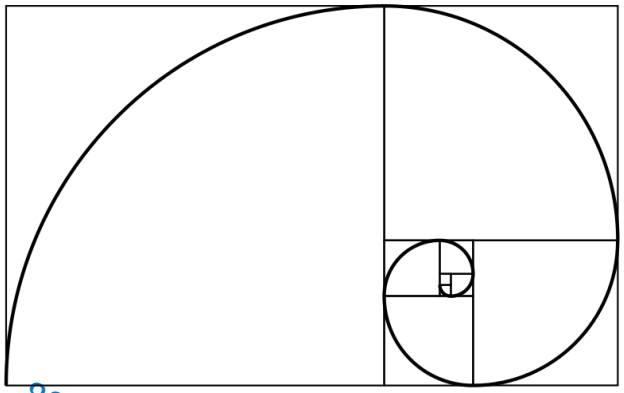

```
def fib(n):
    """Compute the nth Fibonacci number.

    >>> fib(0)
    0
    >>> fib(8)
    21
    """
```

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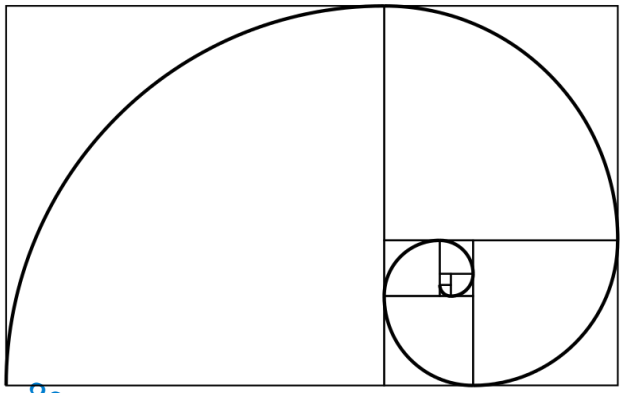

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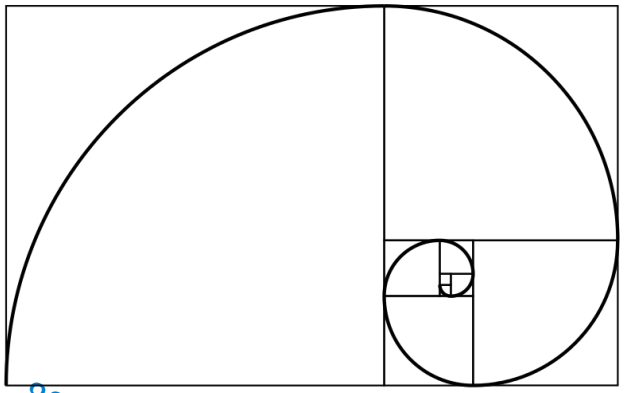

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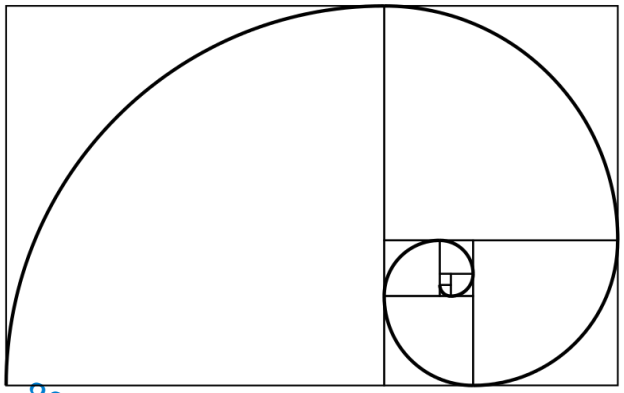

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    while k < n:
        kth, difference = kth + difference, kth
        k = k + 1
    return kth
```

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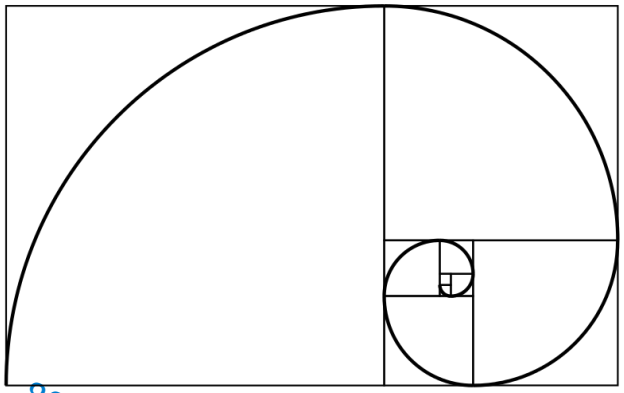

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```
difference = kth
kth = kth + difference
```

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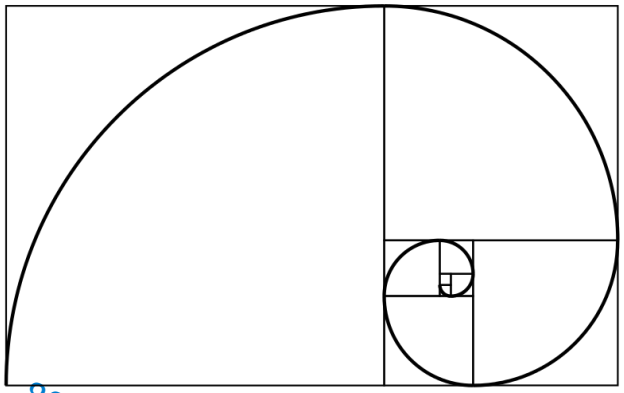

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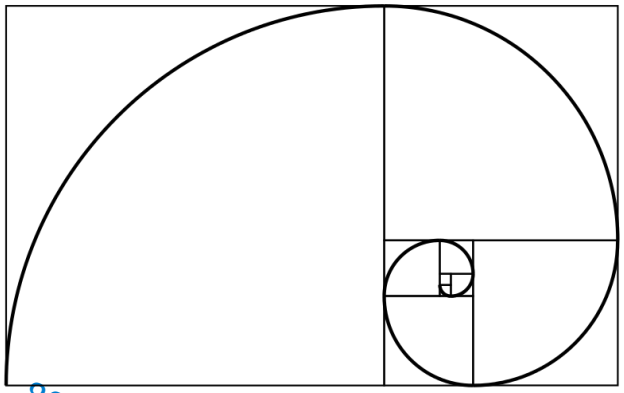

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    while k < n:
        kth, difference = kth + difference, kth
        k = k + 1
    return kth
```

```
old_diff = difference
difference = kth
kth = kth + old_diff
```

```
kth = kth + difference
difference = kth
```

Return

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def end(n, d):
    """Print the final digits of N in reverse order until D is found.

    >>> end(34567, 5)
    7
    6
    5
    """
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    while n > 0:
        last, n = n % 10, n // 10
        print(last)
```

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```

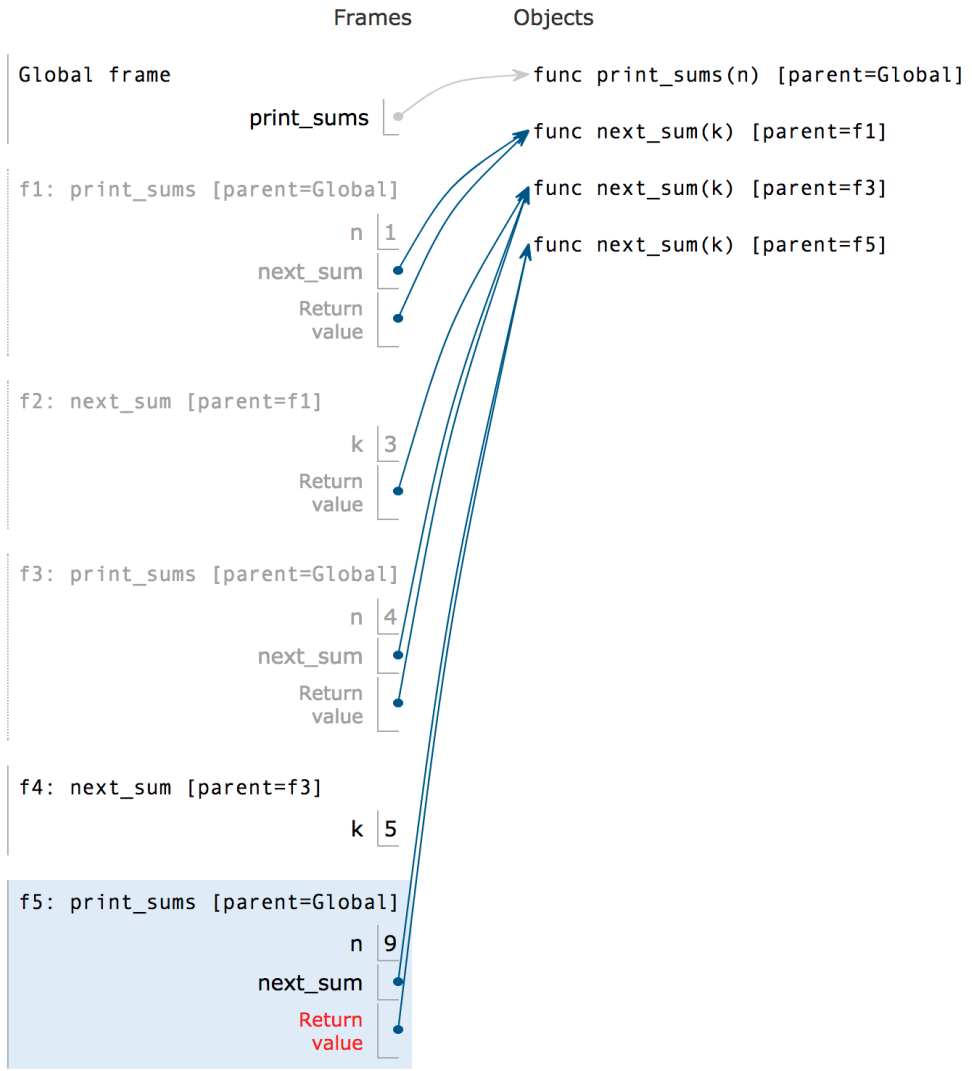
(Demo)

Self-Reference

(Demo)

Returning a Function Using Its Own Name

```
1  def print_sums(n):
2      print(n)
3      def next_sum(k):
4          return print_sums(n+k)
5      return next_sum
6
7  print_sums(1)(3)(5)
```



http://pythontutor.com/composingprograms.html#code=def%20print_all%28k%29%3A%0A%20%20%20%20print%28k%29%0A%20%20%20%20return%20print_all%0A%20%20%20%20%0Aprint_all%281%29%283%29%285%29&cumulative=true&curInstr=0&mode=display&origin=composingprograms.js&py=3&rawInputLstJSON=%5B%5D

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Function Example: Sounds

WAV Files

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WAV Files

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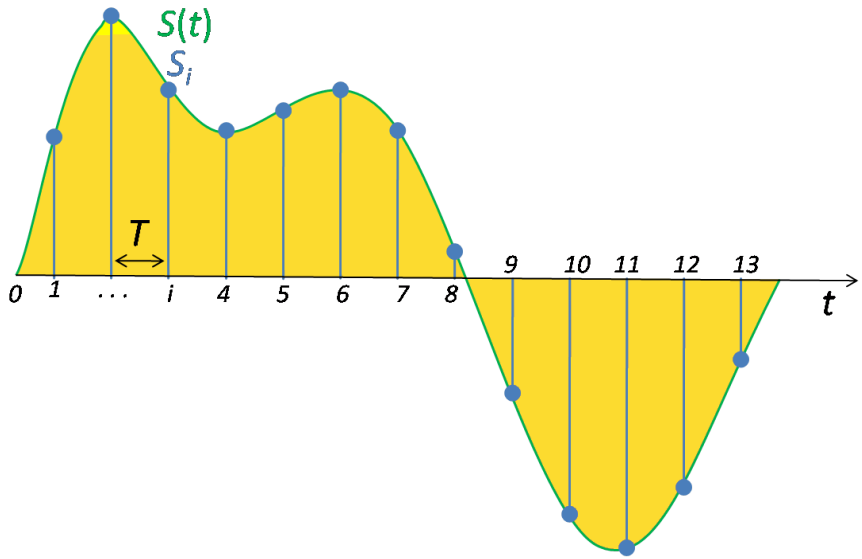

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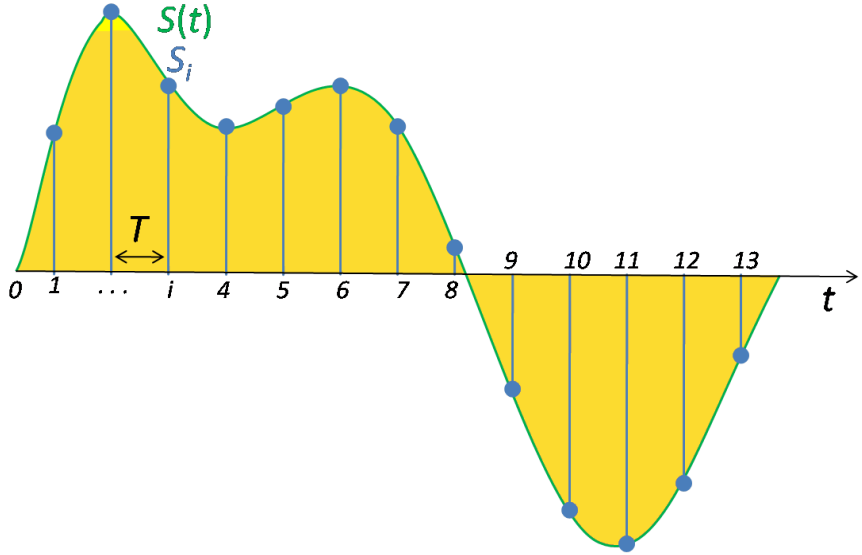

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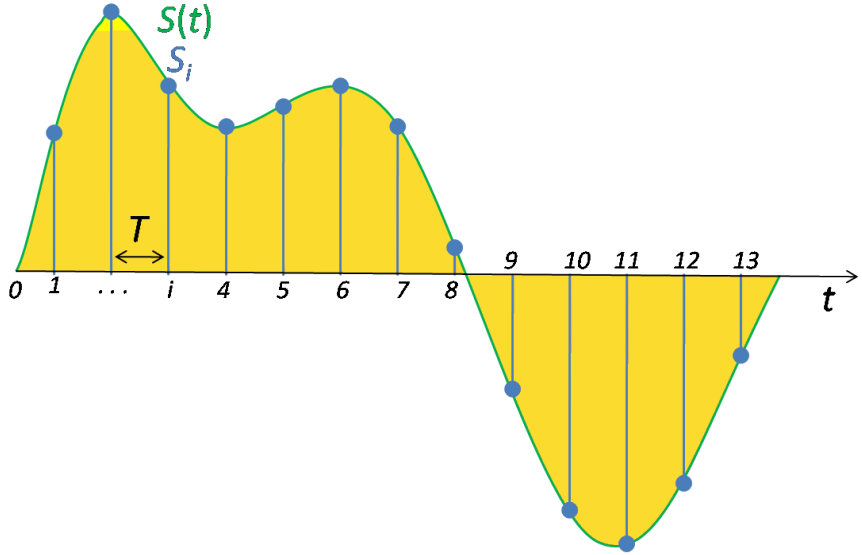

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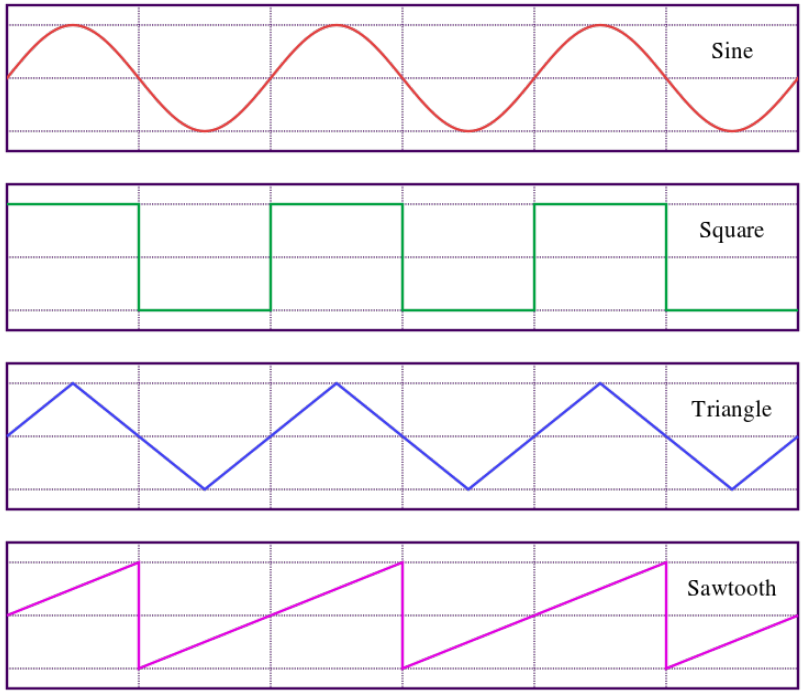

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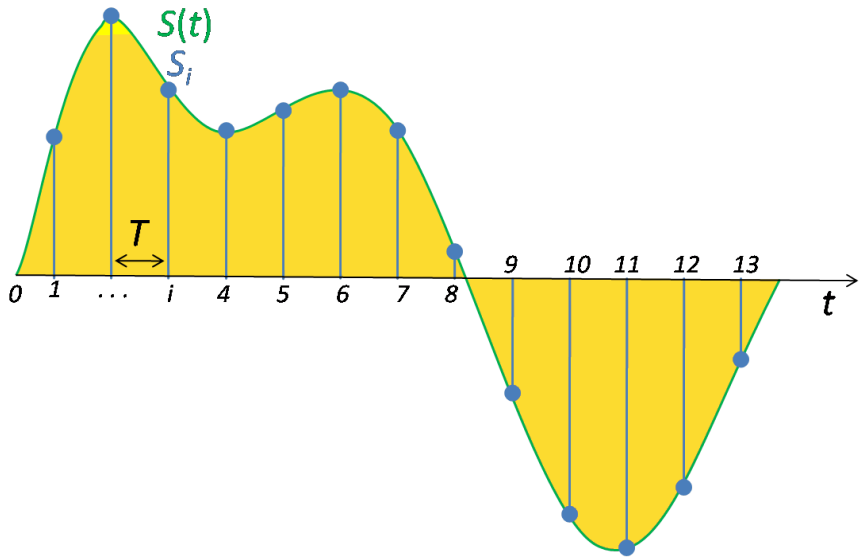

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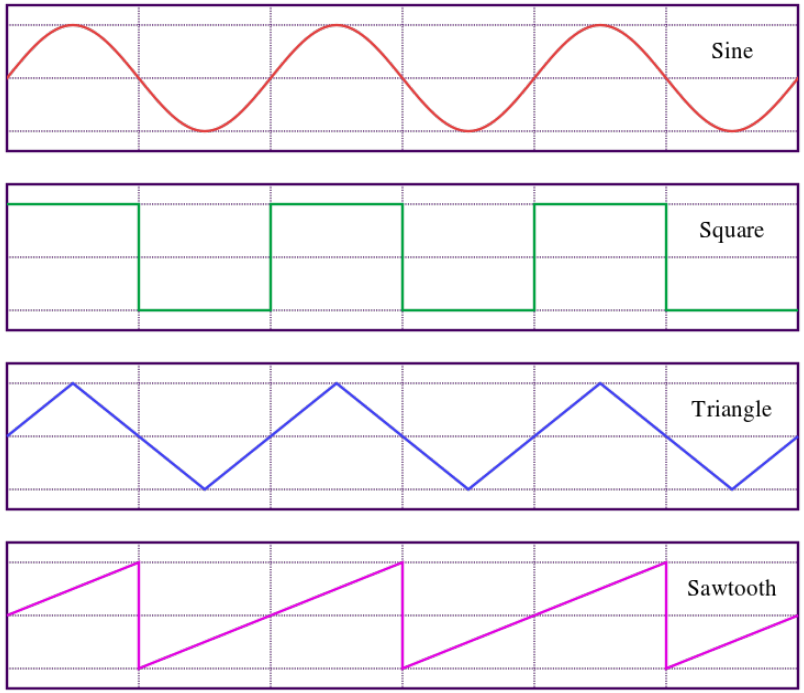

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