

# CS 110

## Functions

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# functions

- Using a **function** in our code allows us to give a name to a block of code
- Whenever we want the block of code to run, we can use the name to invoke the code
- Using functions can help with
  - Reduce redundant code
  - Have better structure!

# functions

With **variables**, we give a name to a **value**

With **functions**, we give a name to **code**

```
def function_name():  
    print('East')  
    print('West')  
    . . .  
    statementN
```

statement . . .

function\_name()

statements . . .

```
def directions():  
    print('East')  
    print('West')
```

statement . . .

directions()

statements . . .

```
def directions():  
    print('East')  
    print('West')
```

 **function  
definition**

statement . . .

**directions()**

 **function  
call**

statements . . .

```
def directions():  
    print('East')  
    print('West')
```

```
statement . . .  
directions()  
directions()  
directions()  
statements . . .
```

```
def directions():  
    print('East')  
    print('West')
```

```
statement . . .  
directions()  
statement . . .  
directions()  
statements . . .
```



```
def directions():  
    print('East')  
    print('West')
```

```
while condition:  
    directions()  
if condition:  
    directions()  
statements . . .
```

# What will this print?

```
def print_row_a():  
    print('#####', end='')
```

```
def print_row_b():  
    print('#####')
```

```
print_row_b()
```

```
print_row_a()  
print_row_b()
```

```
print_row_a()  
print_row_a()  
print_row_b()
```

# What will this print?

```
def print_a():  
    i = 1  
    while i < 5:  
        print('-' * i)  
        i += 1
```

```
def print_b():  
    print('#####')
```

```
print_a()  
print_b()  
print_a()
```

# What will this print?

```
size = int(input('Size:'))
```

```
def repeat():  
    index = 1  
    while index <= size:  
        print('|   |')  
        index += 1
```

```
def print_row():  
    print('+-----+')
```

```
def print_eyes():  
    print_row()  
    print('| 0 0 |')
```

```
def print_shape():  
    print('| \_/_ |')
```

```
print_eyes()  
repeat()  
print_shape()  
repeat()  
print_row()
```

What's the most repetitive song you can think of?

What's the most repetitive song you can think of?

<https://pudding.cool/2017/05/song-repetition/>

# (modified) Watch me whip

[x2:]  
Now watch me whip  
Watch me nae nae  
Now watch me whip whip  
Watch me nae nae

[x2:]  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh ooh ooh ooh

[x2:]  
Now watch me you  
Now watch me superman  
Now watch me you  
Now watch me superman

[x2:]  
Do the stanky leg  
Do the stanky leg

[x2:]  
Now watch me  
Bop bop bop bop bop bop bop bop

[x2:]  
Now watch me whip  
Watch me nae nae  
Now watch me whip whip  
Watch me nae nae

[x2:]  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh ooh ooh ooh

[x2:]  
Now watch me you  
Now watch me superman  
Now watch me you  
Now watch me superman

[x4:]  
Now break your legs  
Break your legs

[x2:]  
Now watch me  
Bop bop bop bop bop bop bop bop

[x2:]  
Now watch me whip  
Watch me nae nae  
Now watch me whip whip  
Watch me nae nae

[x2:]  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh ooh ooh ooh

Crank dat

# Where is the repetition?

[x2:]

Now watch me whip  
Watch me nae nae  
Now watch me whip whip  
Watch me nae nae

[x2:]

Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh ooh ooh ooh

[x2:]

Now watch me you  
Now watch me superman  
Now watch me you  
Now watch me superman

[x2:]

Do the stanky leg  
Do the stanky leg

[x2:]

Now watch me  
Bop bop bop bop bop bop bop bop

[x2:]

Now watch me whip  
Watch me nae nae  
Now watch me whip whip  
Watch me nae nae

[x2:]

Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh ooh ooh ooh

[x2:]

Now watch me you  
Now watch me superman  
Now watch me you  
Now watch me superman

[x4:]

Now break your legs  
Break your legs

[x2:]

Now watch me  
Bop bop bop bop bop bop bop bop

[x2:]

Now watch me whip  
Watch me nae nae  
Now watch me whip whip  
Watch me nae nae

[x2:]

Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh ooh ooh ooh

Crank dat



# Where is the repetition?

[x2:]  
Now watch me whip  
Watch me nae nae  
Now watch me whip whip  
Watch me nae nae

[x2:]  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh ooh ooh ooh

[x2:]  
Now watch me you  
Now watch me superman  
Now watch me you  
Now watch me superman

[x2:]  
Do the stanky leg  
Do the stanky leg

[x2:]  
Now watch me  
Bop bop bop bop bop bop bop bop

[x2:]  
Now watch me whip  
Watch me nae nae  
Now watch me whip whip  
Watch me nae nae

[x2:]  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh ooh ooh ooh

[x2:]  
Now watch me you  
Now watch me superman  
Now watch me you  
Now watch me superman

[x4:]  
Now break your legs  
Break your legs

[x2:]  
Now watch me  
Bop bop bop bop bop bop bop bop

[x2:]  
Now watch me whip  
Watch me nae nae  
Now watch me whip whip  
Watch me nae nae

[x2:]  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh ooh ooh ooh

Crank dat

# Where is the repetition?

[x2:]  
Now watch me whip  
Watch me nae nae  
Now watch me whip whip  
Watch me nae nae

[x2:]  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh ooh ooh ooh

[x2:]  
Now watch me you  
Now watch me superman  
Now watch me you  
Now watch me superman

[x2:]  
Do the stanky leg  
Do the stanky leg

[x2:]  
Now watch me  
Bop bop bop bop bop bop bop bop

[x2:]  
Now watch me whip  
Watch me nae nae  
Now watch me whip whip  
Watch me nae nae

[x2:]  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh ooh ooh ooh

[x2:]  
Now watch me you  
Now watch me superman  
Now watch me you  
Now watch me superman

[x4:]  
Now break your legs  
Break your legs

[x2:]  
Now watch me  
Bop bop bop bop bop bop bop bop

[x2:]  
Now watch me whip  
Watch me nae nae  
Now watch me whip whip  
Watch me nae nae

[x2:]  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh watch me, watch me  
Ooh ooh ooh ooh

Crank dat

# Watch me

- Download the `wmw.py`
- Refactor to use functions - minimize lines of code

```
def print_chorus():
    print('[x2:]')
    print('Now watch me whip')
    print('Watch me nae nae')
    print('Now watch me whip whip')
    print('Watch me nae nae')
    print()
    print('[x2:]')
    print('Ooh watch me, watch me')
    print('Ooh watch me, watch me')
    print('Ooh watch me, watch me')
    print('Ooh ooh ooh ooh')
    print()
```

```
def print_superman():
    print('Now watch me you')
    print('Now watch me superman')
    print('Now watch me you')
    print('Now watch me superman')
    print()
```

```
def print_stanky():
    print('[x2:]')
    print('Do the stanky leg')
    print('Do the stanky leg')
    print()
```

```
def print_bop():
    print('[x2:]')
    print('Now watch me')
    print('Bop bop bop bop bop bop bop bop')
    print()
```

```
def print_break():
    print('[x4:]')
    print('Now break your legs')
    print('Break your legs')
    print()
```

```
print_chorus()
print_superman()
print_stanky()
print_bop()
```

```
print_chorus()
print_superman()
print_break()
print_bop()
```

```
print_chorus()
print('Crank dat')
```