

gist:

Break a pyjail that has very limited input size and only "print" as built-in.

steps:

1. run script
2. test limitations
3. try and research commands and flags
4. another approach - redirection
5. proof of concept and further ideas

1. In this case you just need to navigate to the folder of the challenge and run it via:

```
python chall.py
```

2. Now I tried different inputs and yes, this jail is very narrow and **42** chars is not much to do something meaningful.

The first inputs that yielded some info was:

```
>>> print(print.__module__)
builtins
```

and:

```
>>> print(__builtins__.__dir__)
<built-in method __dir__ of dict object at 0x7ff1f8c38500>
```

since we know it is a dict, I tried:

```
>>> print(__builtins__.keys())
dict_keys(['print'])
```

and:

```
>>> print(__builtins__.values())
dict_values([<built-in function print>])
```

```
>>> print(print.__class__)
<class 'builtin_function_or_method'>
```

which rather feels like running in circles.

```
>>> print(().__class__.__bases__[0].__name__)
object
```

```
>>> print(().__class__.__mro__)
(<class 'tuple'>, <class 'object'>)
```

led me to another path, which I later abandoned. As there is so little to leverage, what candidates are left?

- print
- eval

- AssertionError
- throw

And then I had the idea that may be considered as a solve: **redirection!**

Alas, redirection **from within** the jail would have been too easy:

```
>>> print("J") > flag.txt
J
```

didn't create the file but threw an error that the name was not defined. But what if I already set up the redirection to file when calling up the jail?

```
python chall.py > flag.txt
print("ctf{brev}")
```

did the trick, the file was created.

To demonstrate that this is a **proper RCE**, I tested the same with an input as text which is way too large for the jailed prompt.

```
python chall.py > large_test.txt
print("Mein Vati hat drei grunzende Schweine")
```

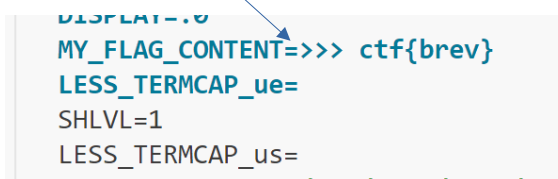
Should yield the assertion error and **it did!** The file was created but only contained the arrowheads that were missing from the prompt when calling the jailed script this way.

Further ideas:

While I could not really read out the flag from within the jail, I thought about other places than a file to redirect to and environment variables came to my mind.

```
export MY_FLAG_CONTENT=$(python chall.py)
print("ctf{brev}")
```

Again I could verify the functionality with **printenv** and then tested for large input, to see if we are actually in the jailed shell. As you can see in the picture, the **arrowheads** from the prompt format are mistakenly added to the printed output



```
DISPLAY=:0
MY_FLAG_CONTENT=>>> ctf{brev}
LESS_TERMCAP_ue=
SHLVL=1
LESS_TERMCAP_us=
PS0=
PS1=
PS2=
PS3=
PS4=
PS5=
PS6=
PS7=
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