

Why does attempting to echo an undefined environment variable result in the message “ECHO is on”?

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From a batch file, suppose you try to echo the contents of a variable that hasn't been defined:

```
set AWESOME=1
echo %AWESUM%
```

This prints `ECHO is off`. What's up with that?

The first half of the puzzle is knowing that if a variable is not defined, then it expands to an empty string. Therefore, after expansion, the command

```
echo %AWESUM%
```

becomes simply

```
echo
```

The second half of the puzzle is knowing that the `ECHO` command, if run with no command line, reports the current echo state, printing either `ECHO is on` or `ECHO is off`, accordingly.

Putting it all together: If you try to echo the value of an undefined variable, and the variable is not defined, then the echo command gets a blank command line, at which point it reports its current state.

So how do you echo the value of a variable that might be undefined?

One way is to put something else on the command line.

```
echo AWESUM=%AWESUM%
```

If `AWESUM` is not defined, this will expand to

```
echo AWESUM=
```

and that prints `AWESUM=`.

Okay, but what if you really want to echo the value on a line all by itself?

You can exploit a quirk of the `ECHO` command: If you follow the word `ECHO` immediately with a period (no space), then the period is not echoed, but the presence of the period suppresses the “no command line” behavior, and you get a blank line.

```
ECHO.
```

That prints a blank line.

If you want to print a variable that might not be defined, you would say

```
ECHO.%AWESUM%
```

This quirk of the `ECHO` command was originally a bug in the command line parser, but once people discovered it, the bug became elevated to a feature. (The phenomenon of a bug elevated to a feature happens a lot. Obligatory XKCD.)

Exercise: Explain the output of this batch file, and how would you fix it so it prints `/?` ?

```
set message=/?  
echo %message%
```

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