Assembly : Stack & Procedure

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Stack

Definition

A block of memory to store stack

Syntax

```
.STACK size_in_bytes
; if not mentioned , 1KB is set aside for stack
```

`SS (Stack Segment)` : contains segment number of stack segment

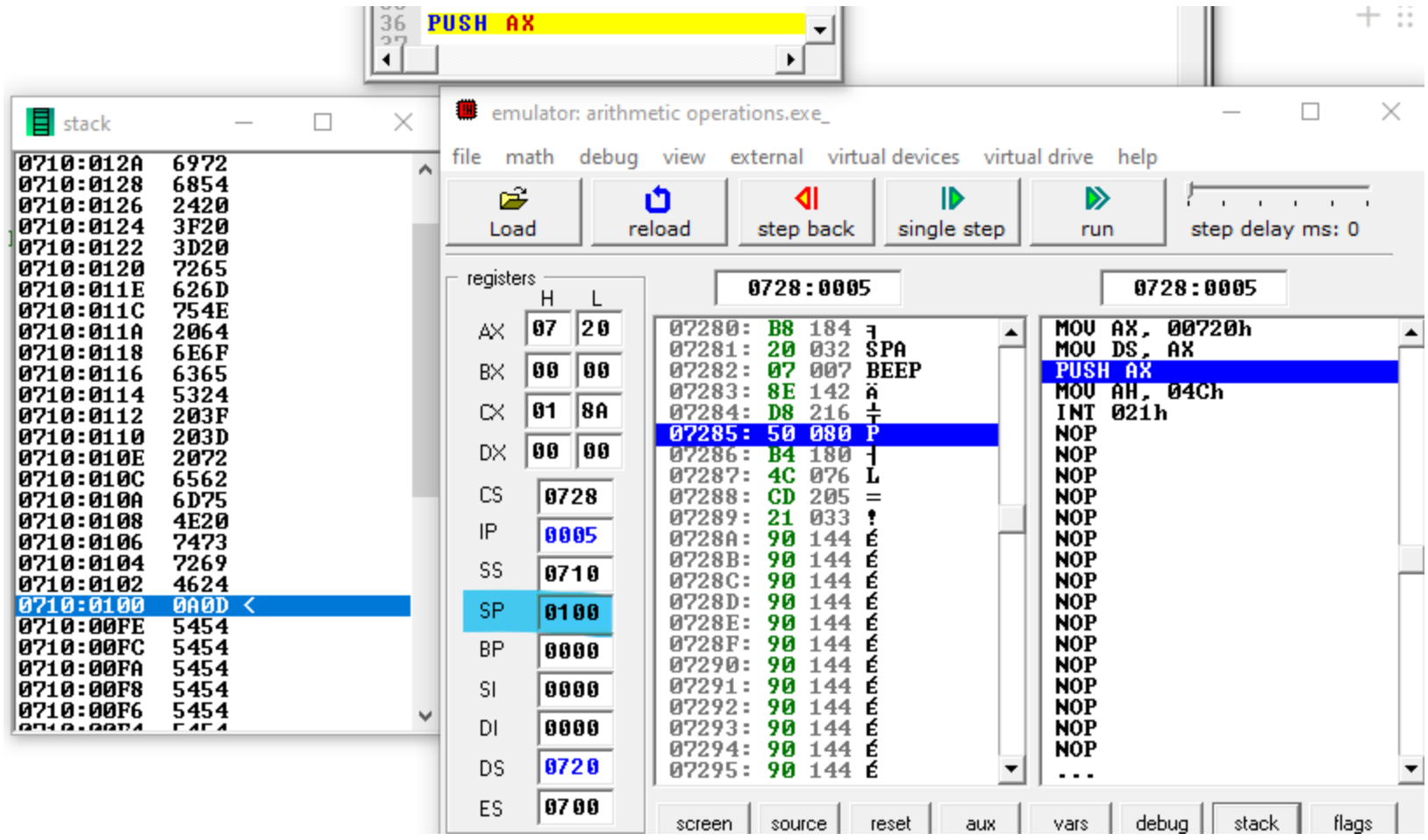
`SP (Stack Pointer)` : contains offset address of the top of the stack

`PUSH` operation

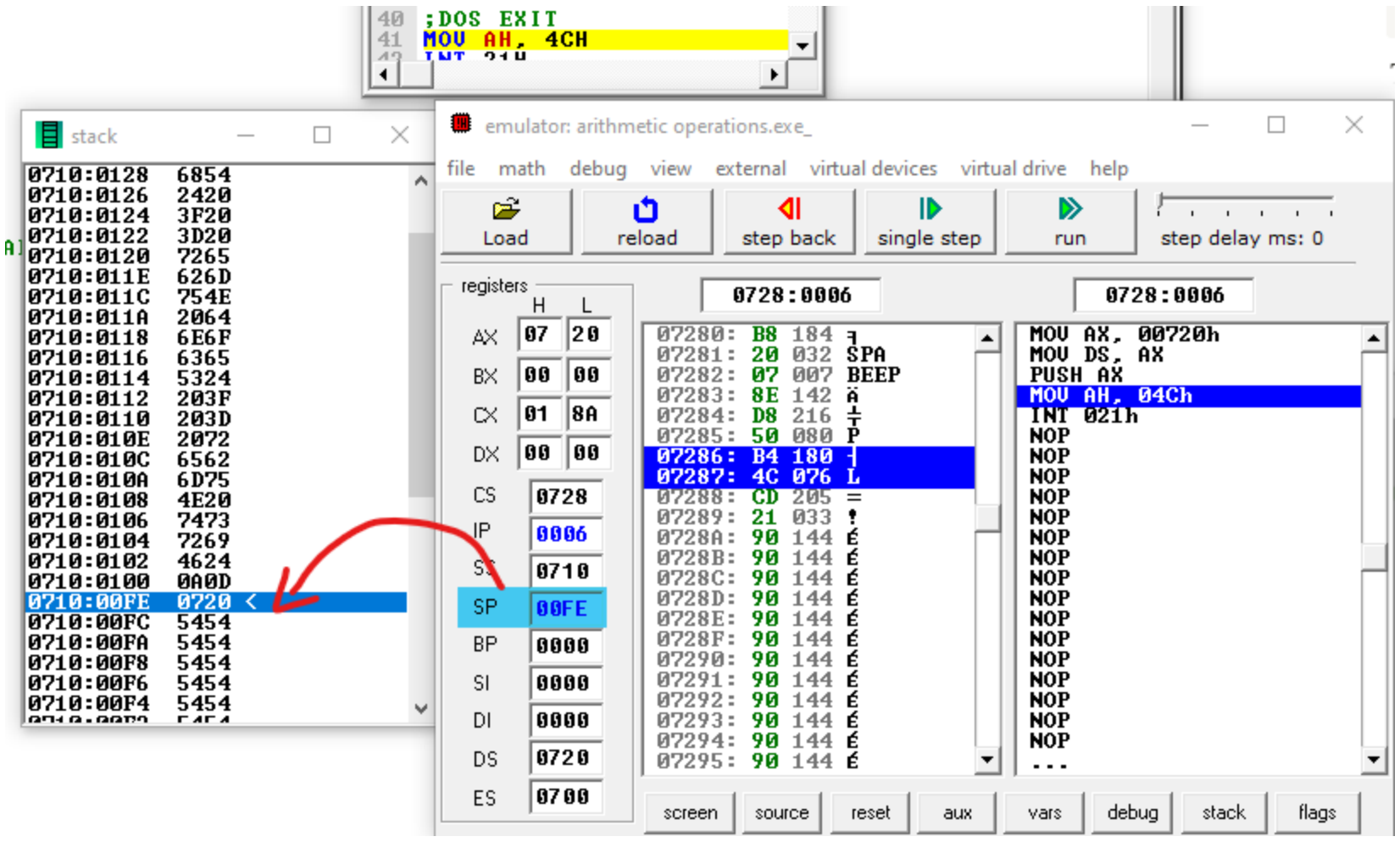
```
; PUSH SOURCE

PUSH AX
```

The following happens

- `SP` is decreased by 2
- Source content is copied to the address `SS:SP`



before push operation



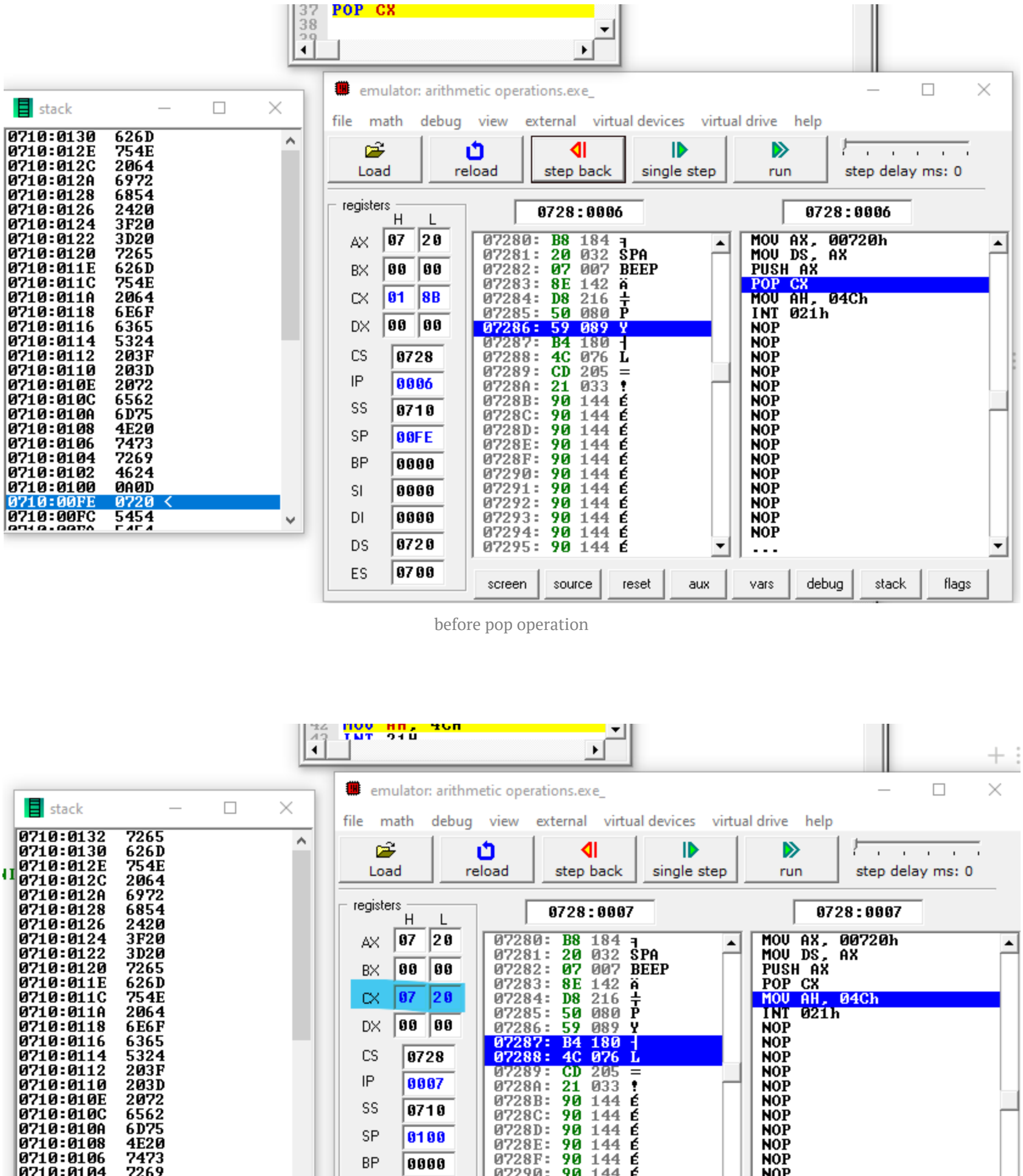
after push operation

`POP` Operation

```
; POP DESTINATION

POP CX
```

The following happens

- The content of `SS:SP` is moved to the destination
- `SP` is increased by 2



before pop operation

after pop operation

`PUSHF` Operation

- No source operand is allowed here
- Pushes the contents of FLAGS register onto the stack

`POPF` Operation

- Reverse of PUSHF
- Pops the top of the stack into FLAGS register

Note

elements should be popped in the reverse order they are pushed . otherwise , the registers wont have the right values

```
PUSH A
PUSH B
PUSH C
...
...
POP C
POP B
POP A
```

Procedure

Declaration

```
name PROC type
; body of the procedure
     RET
name ENDP
```

- `name` is the user-defined name of the procedure
- `type` is optional, can be “FAR”/”NEAR”
- `RET` causes control back to the calling procedure
- procedure is called using `CALL`