The TinyJ Virtual Machine’s Memory (VM Registers are Not Shown)

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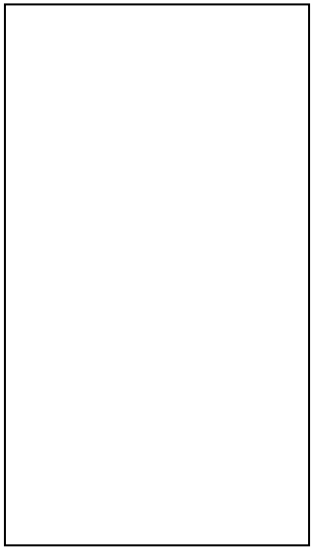
STATICALLY
ALLOCATED
DATA MEMORY



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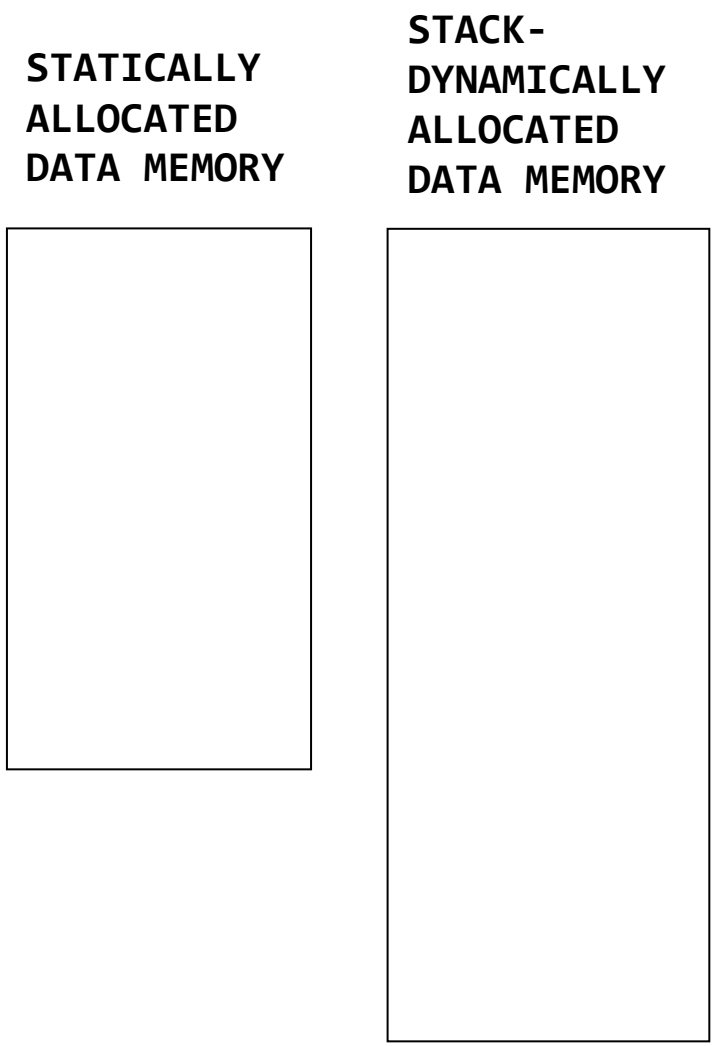

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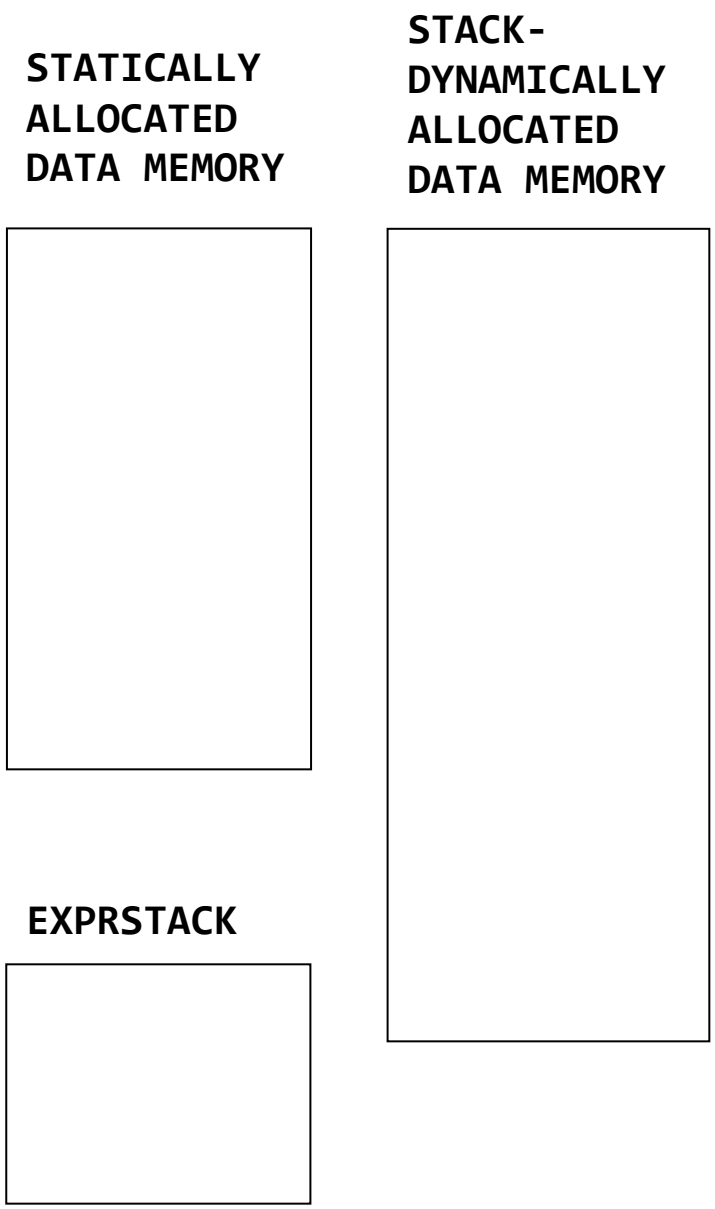

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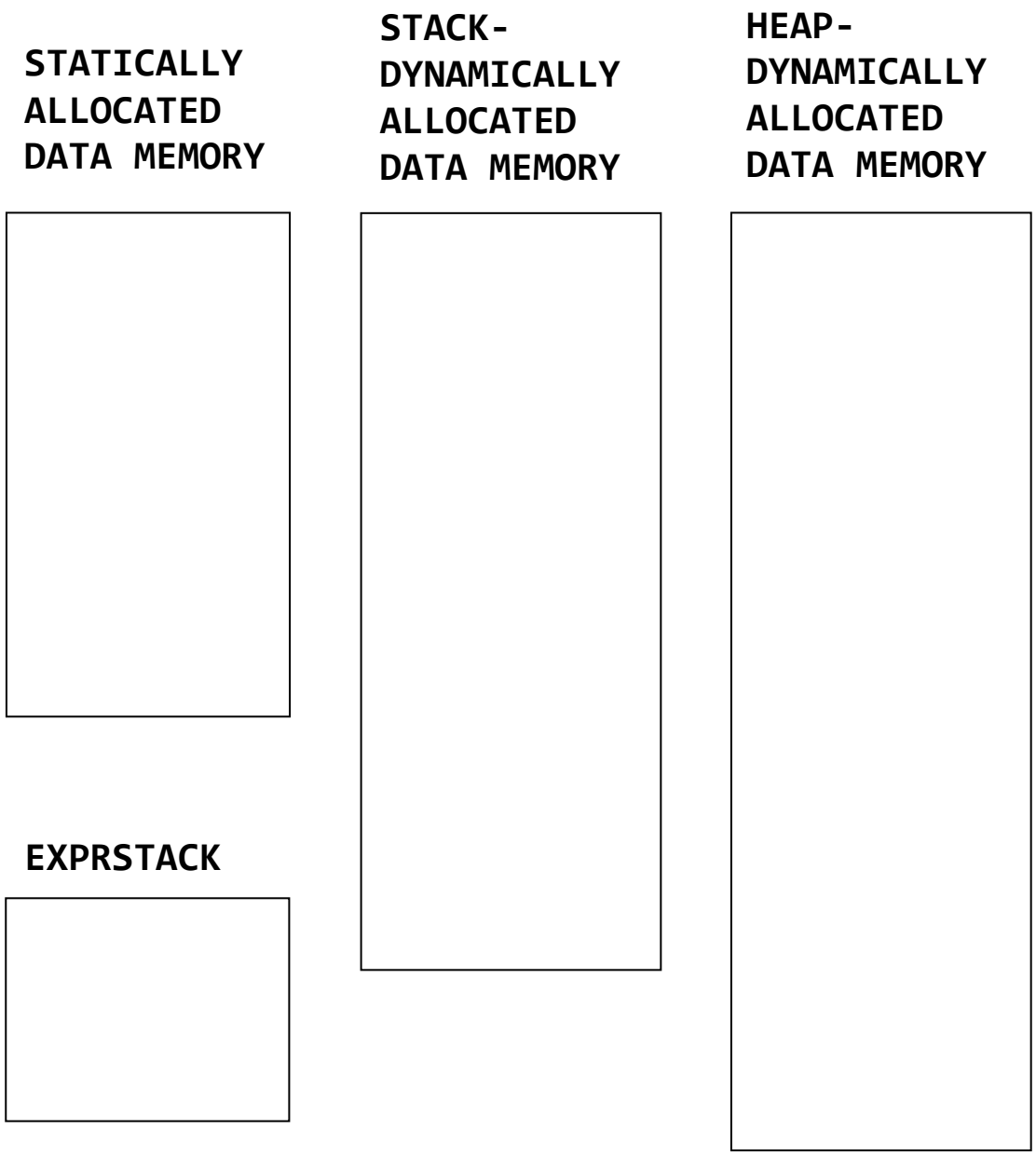

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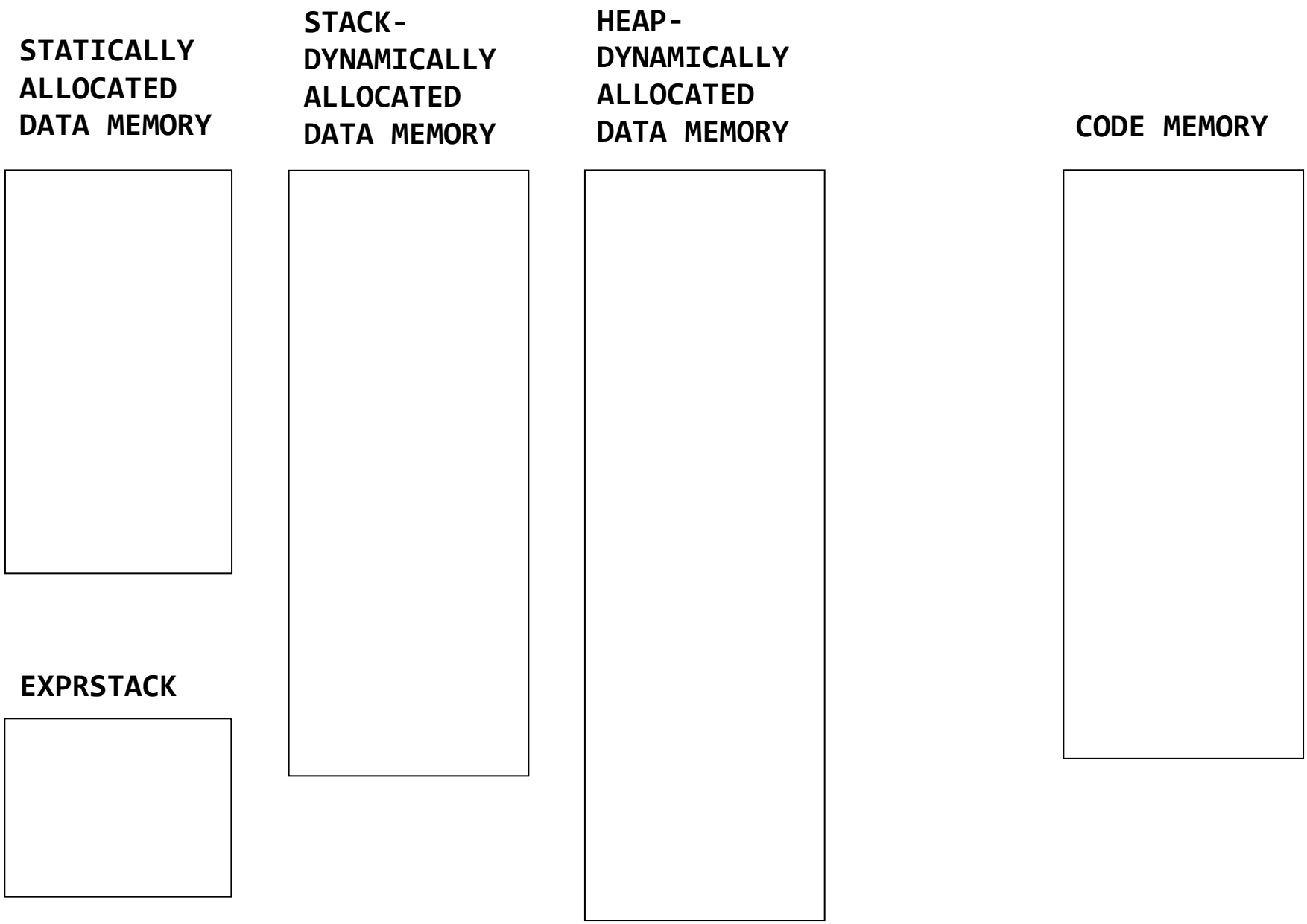

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address	Data Memory	allocated to / for:

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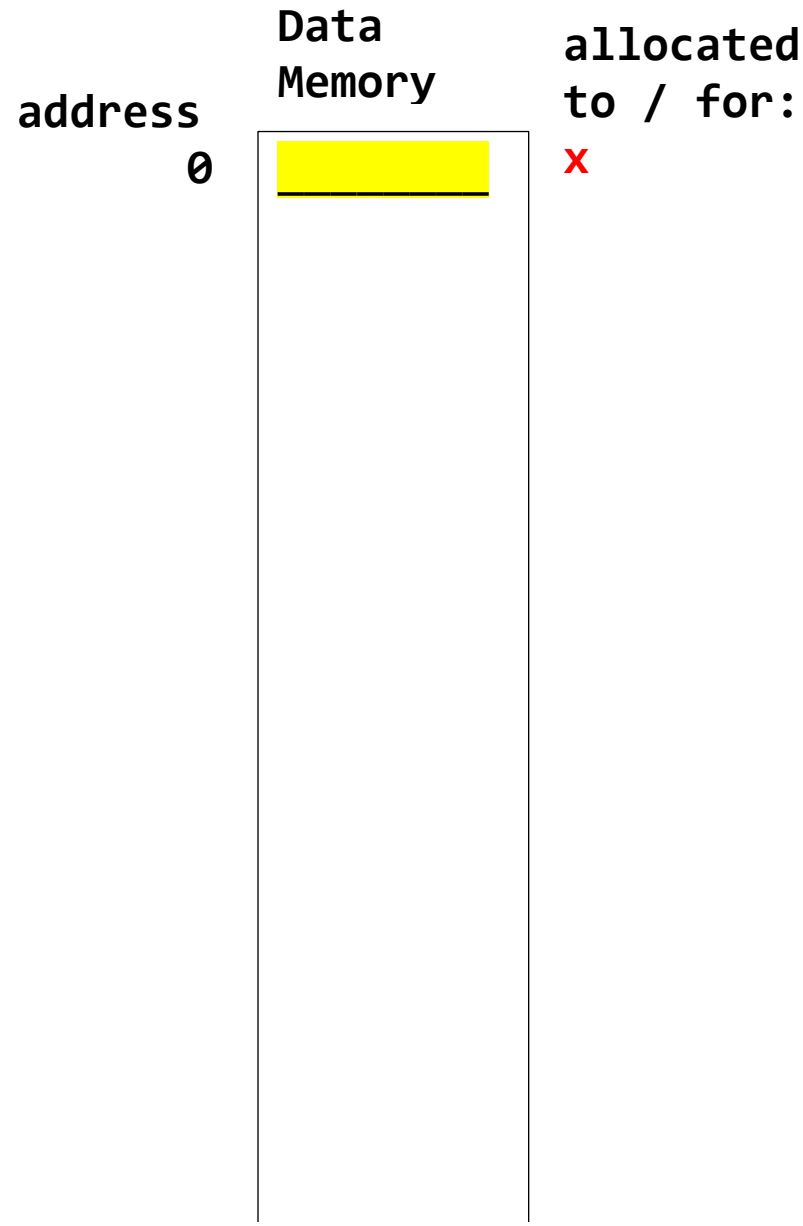

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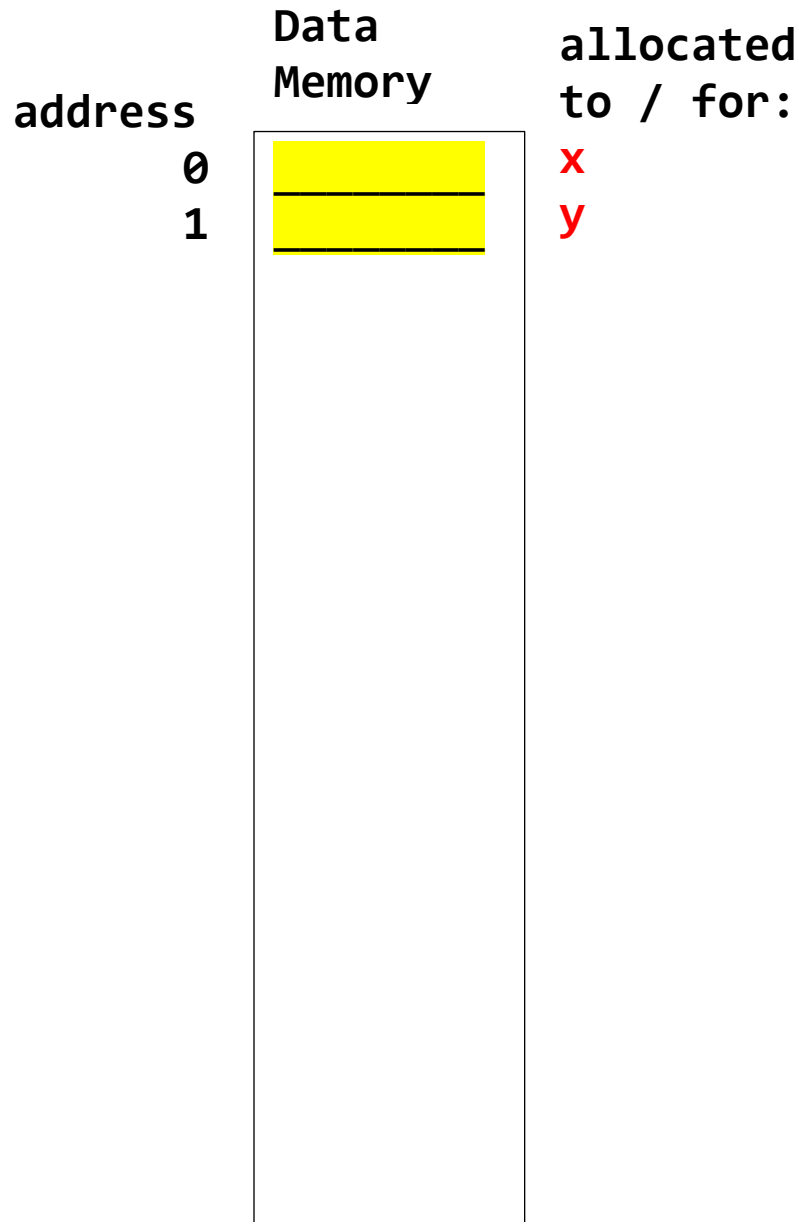

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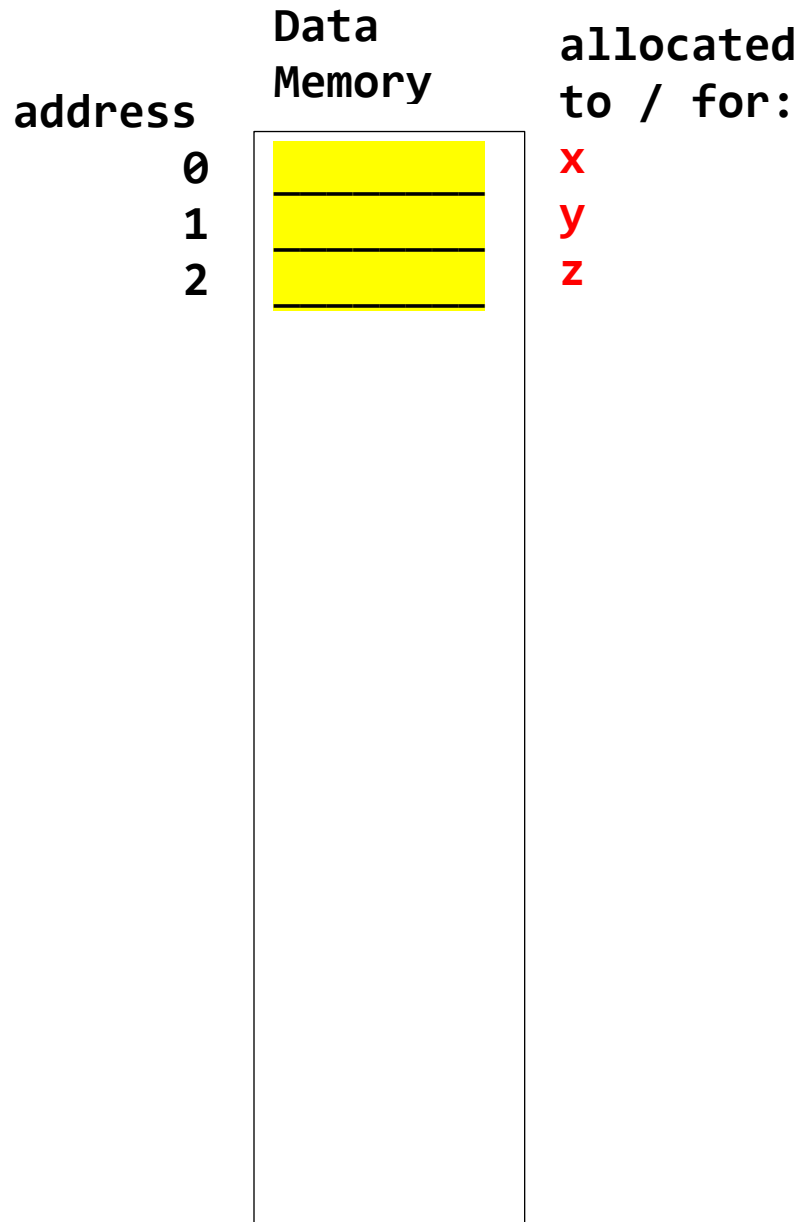

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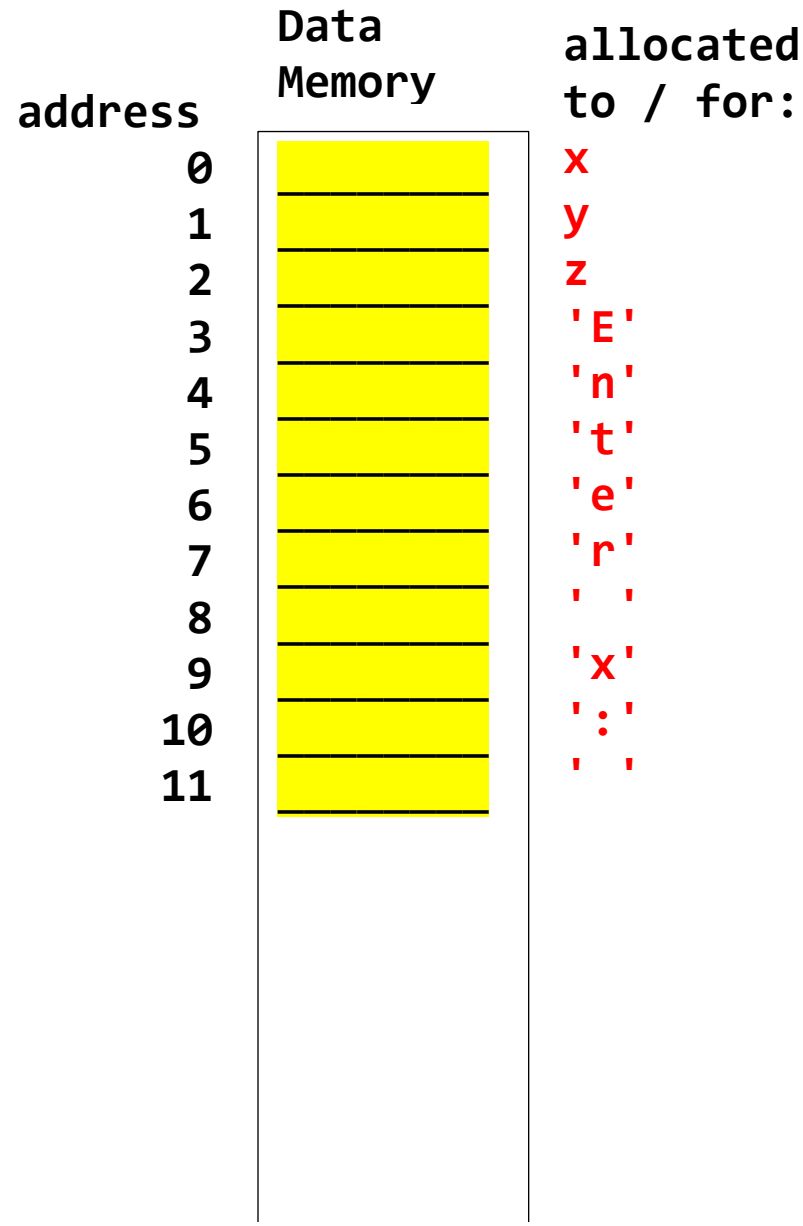

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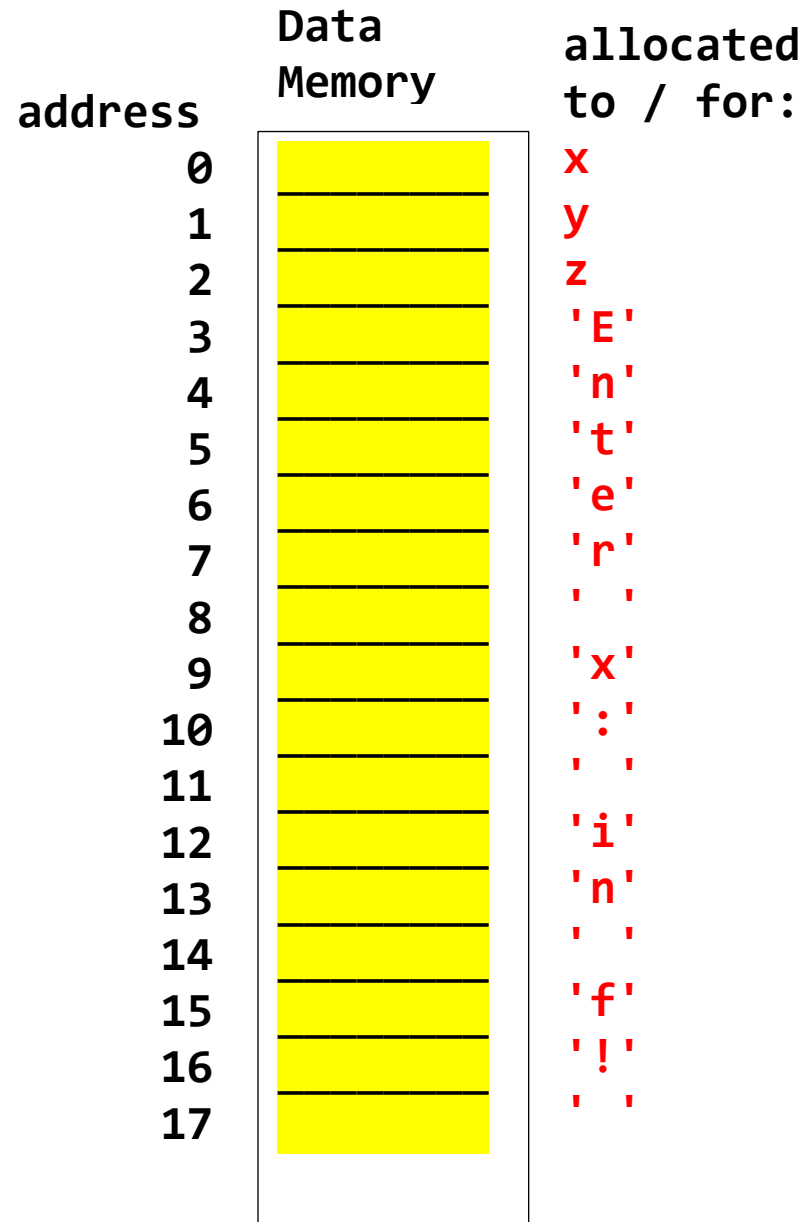

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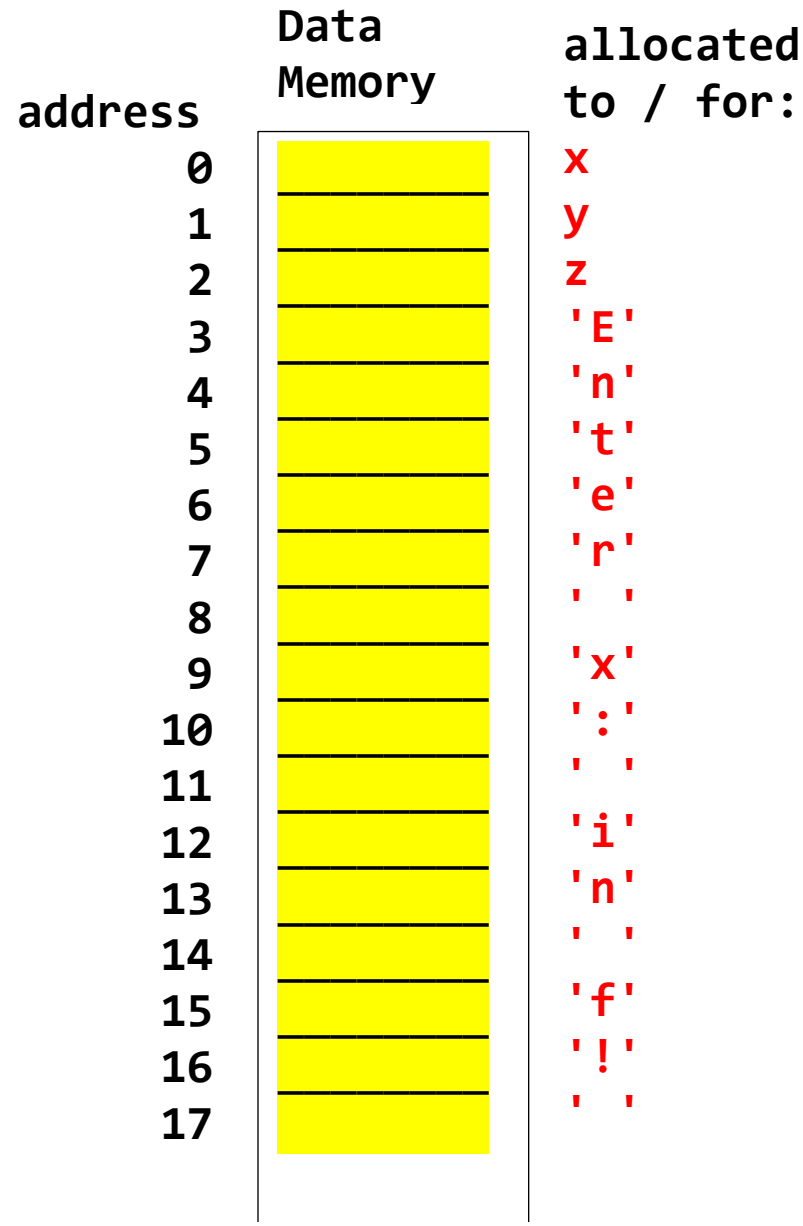
Answer: 18 locations are statically allocated as shown above.



An Example: How many locations are allocated for each stackframe of the following function, and what stackframe offset is given to each formal parameter and each local variable declared in the body?

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```
int my_func(int x, int[] y, int z)   ANSWER:
{
  int a, b[];
  if ( ... ) {
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       ...
  }
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int my_func(int x, int[] y, int z)   ANSWER: 11
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See pp. 3-4 of:
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ANSWER: 11

offset | **Stackframe of any call of my_func** | allocated to

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ANSWER: 11

Stackframe of any call of my_func

offset		allocated to
-1		return addr
0		dynamic link

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ANSWER: 11

Stackframe of any call of my_func

offset	allocated to
-2	z
-1	return addr
0	dynamic link

An Example: How many locations are allocated for each stackframe of the following function, and what stackframe offset is given to each formal parameter and each local variable declared in the body?

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  }
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```

ANSWER: 11

Stackframe of any call of my_func

offset	allocated to
-3	y
-2	z
-1	return addr
0	dynamic link

An Example: How many locations are allocated for each stackframe of the following function, and what stackframe offset is given to each formal parameter and each local variable declared in the body?

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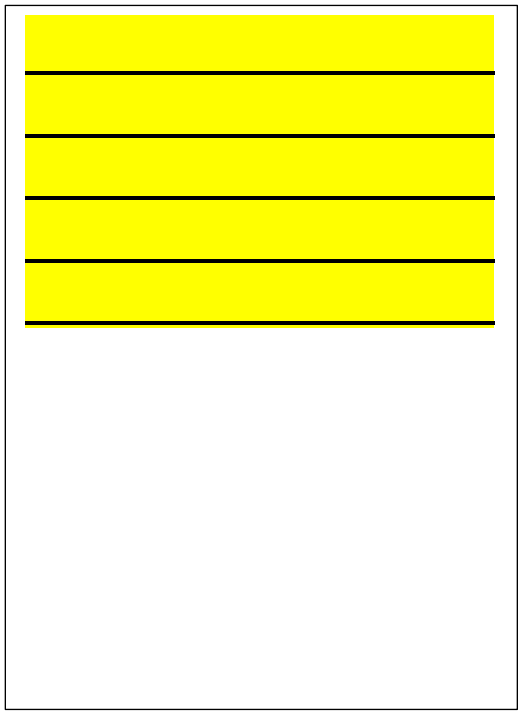
ANSWER: 11

Stackframe of any call of my_func

offset	allocated to
-4	x
-3	y
-2	z
-1	return addr
0	dynamic link



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Stackframe of any call of my_func

offset	allocated to
-4	x
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-1	return addr
0	dynamic link
+1	a

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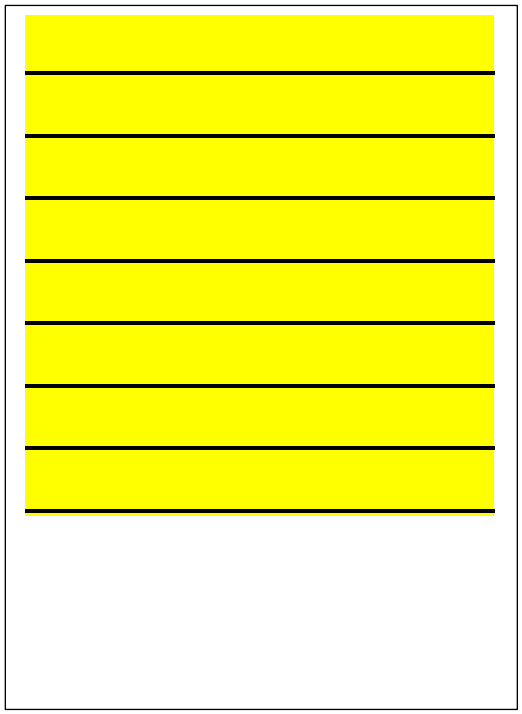

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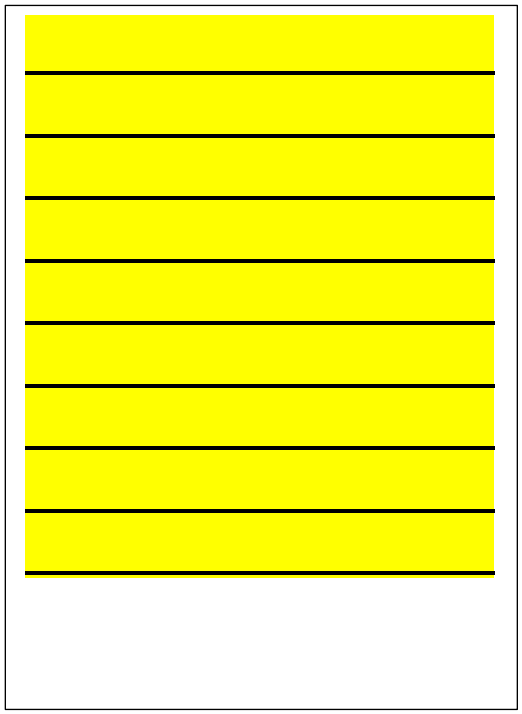

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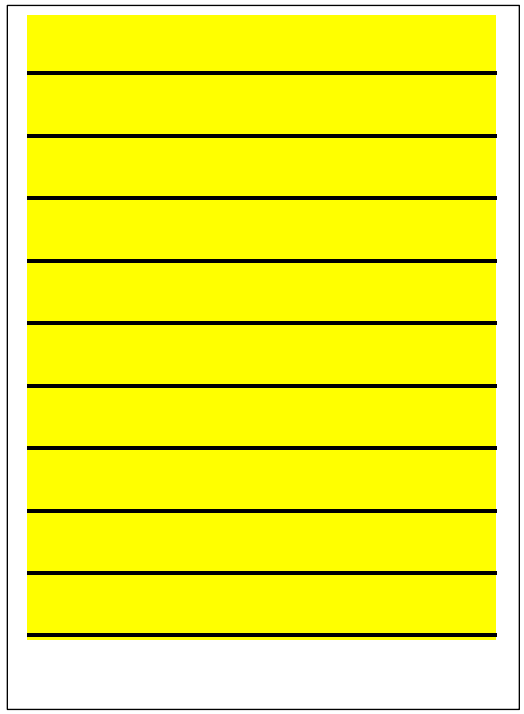

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-2	z
-1	return addr
0	dynamic link
+1	a
+2	b
+3	c, e, h
+4	d, f, i
+5	g, j
+6	k

Example of Stack-Dynamic Allocation

See p. 4 of: https://euclid.cs.qc.cuny.edu/316/Memory-allocation-VM-instruction-set-and-hints-for-asn-2.pdf

How are stackframes allocated and deallocated during execution of the following sequence of calls and returns?

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How are stackframes allocated and deallocated during execution of the following sequence of calls and returns?

```
(1) main() is called
(2)  main() calls f()
(3)   f() calls g()
(4)    g() calls h()
(5)     h() calls f()
(6)      f() returns control to h()
(7)     h() returns control to g()
(8)    g() calls f()
```

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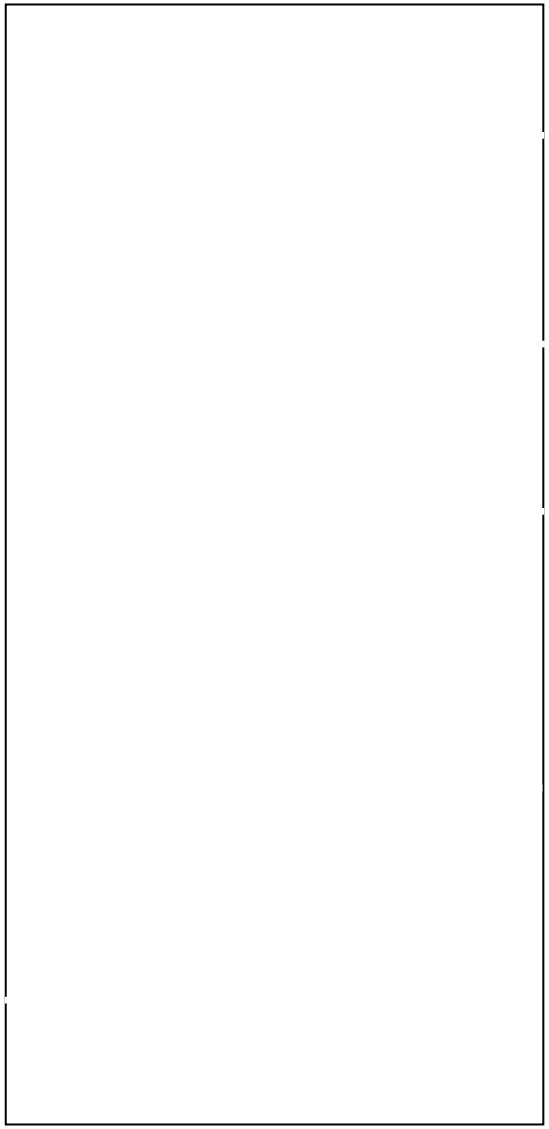
Stack-Dynamically Allocated Data Memory



Example of Stack-Dynamic Allocation

See p. 4 of: https://euclid.cs.qc.cuny.edu/316/Memory-allocation-VM-instruction-set-and-hints-for-asn-2.pdf

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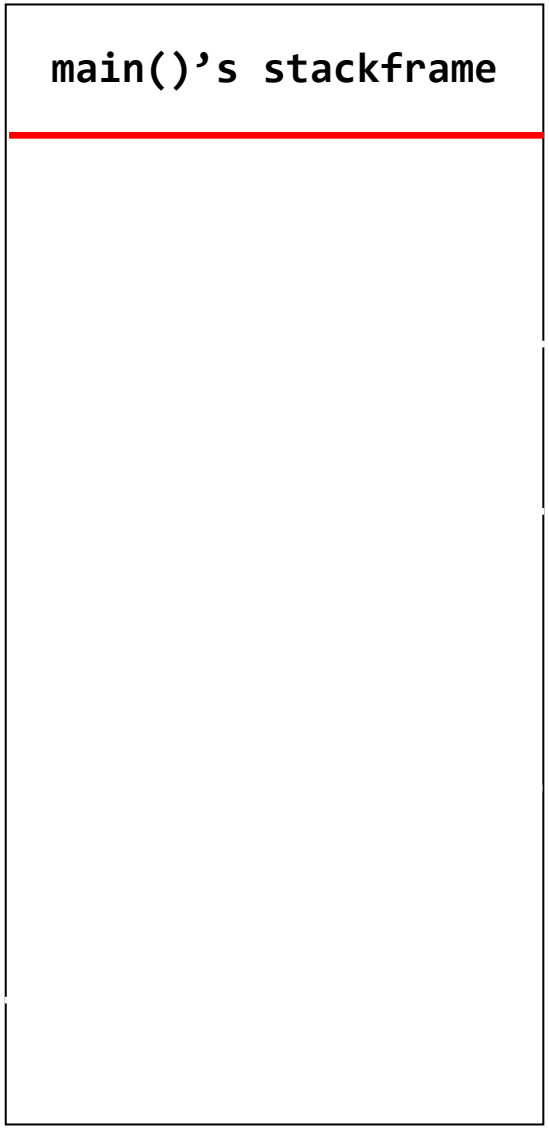

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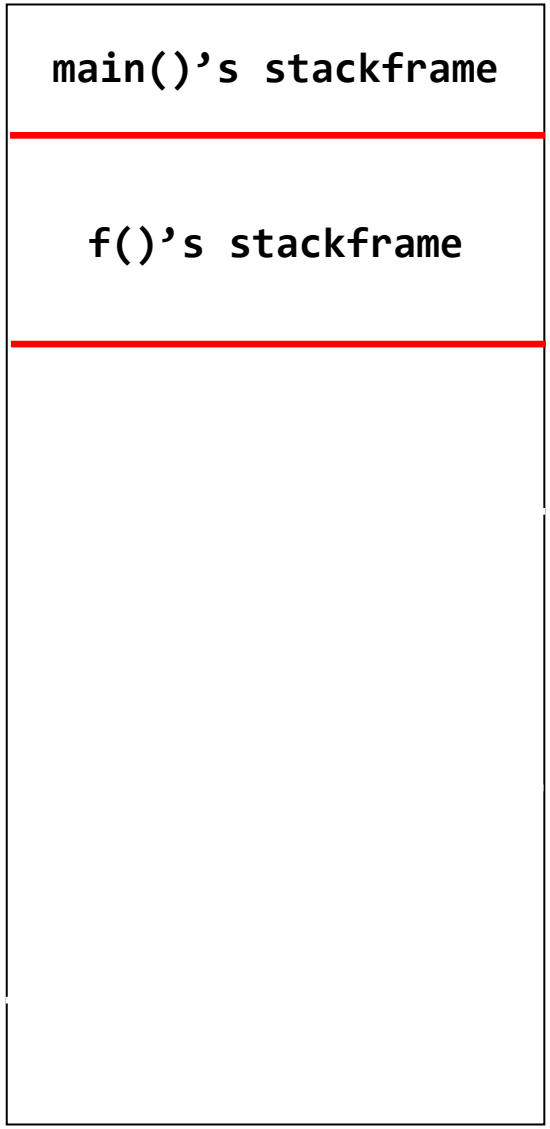

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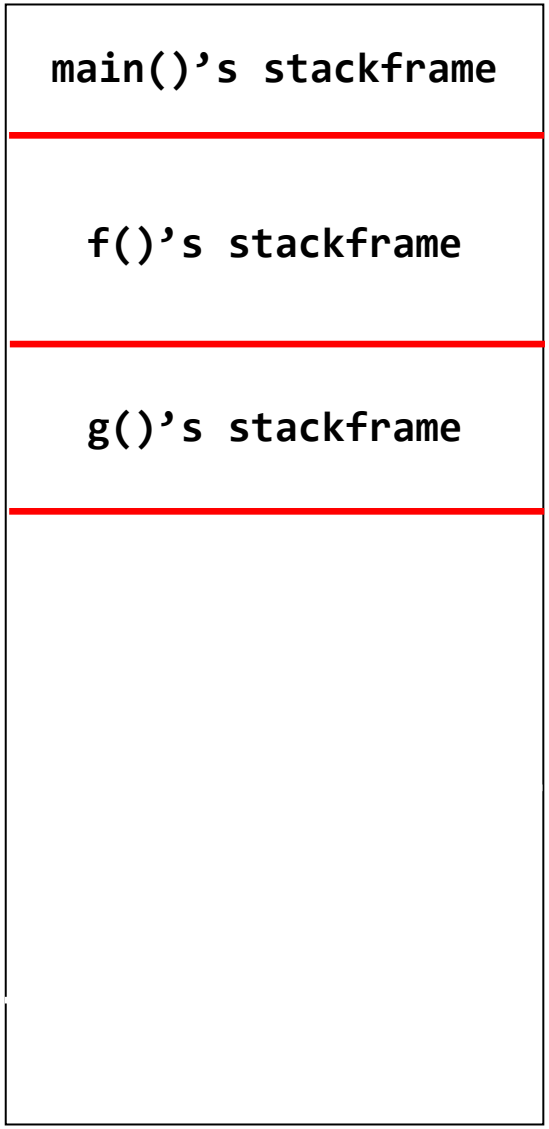

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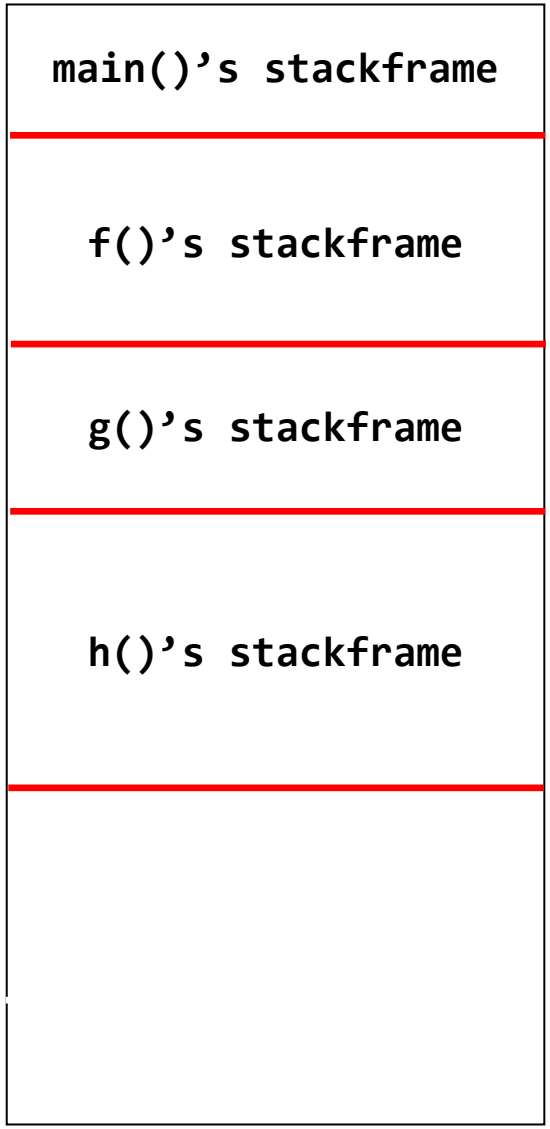

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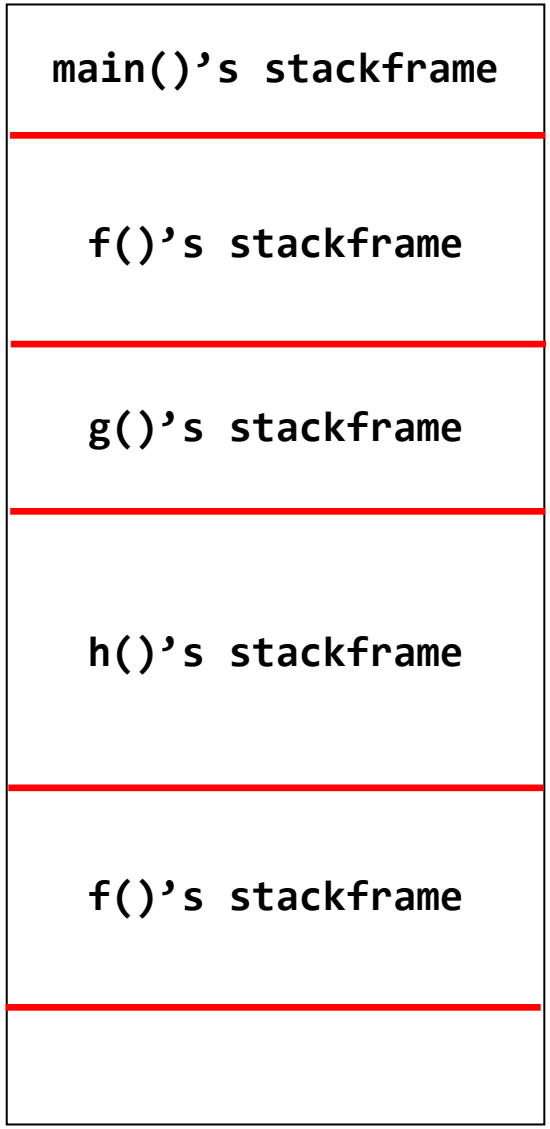

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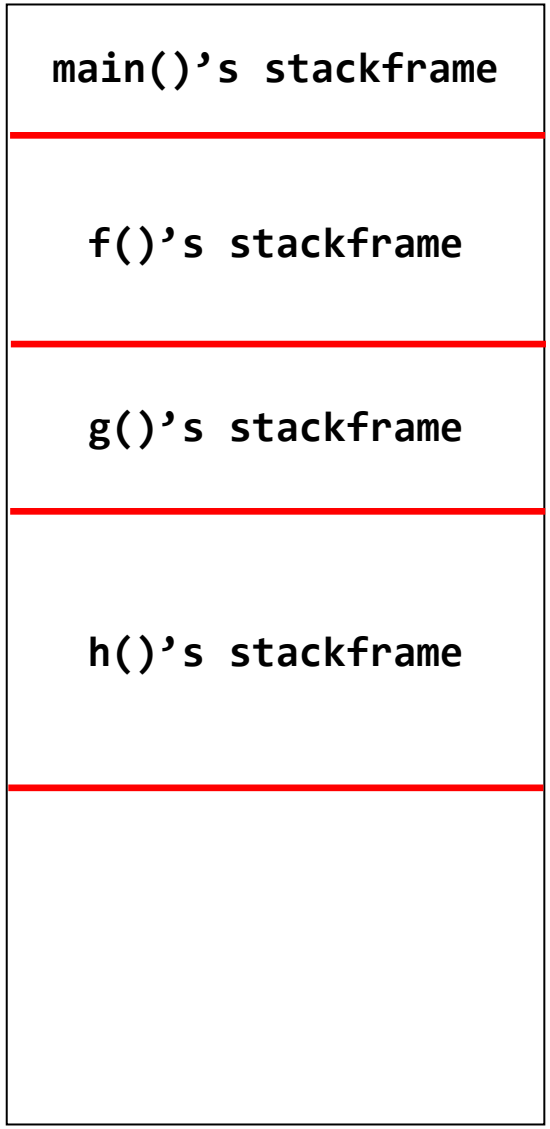

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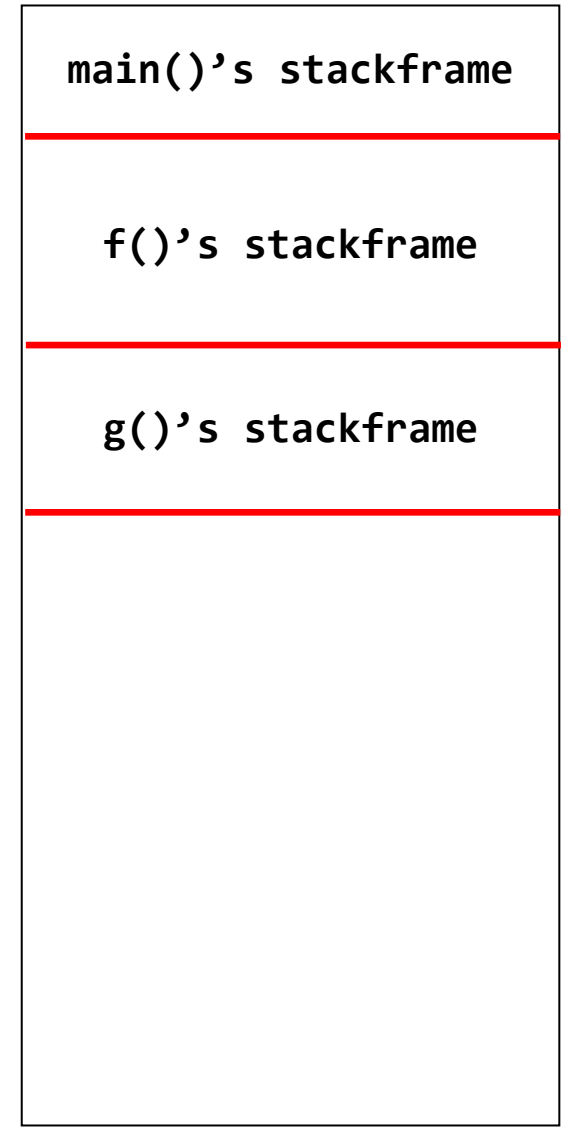

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