



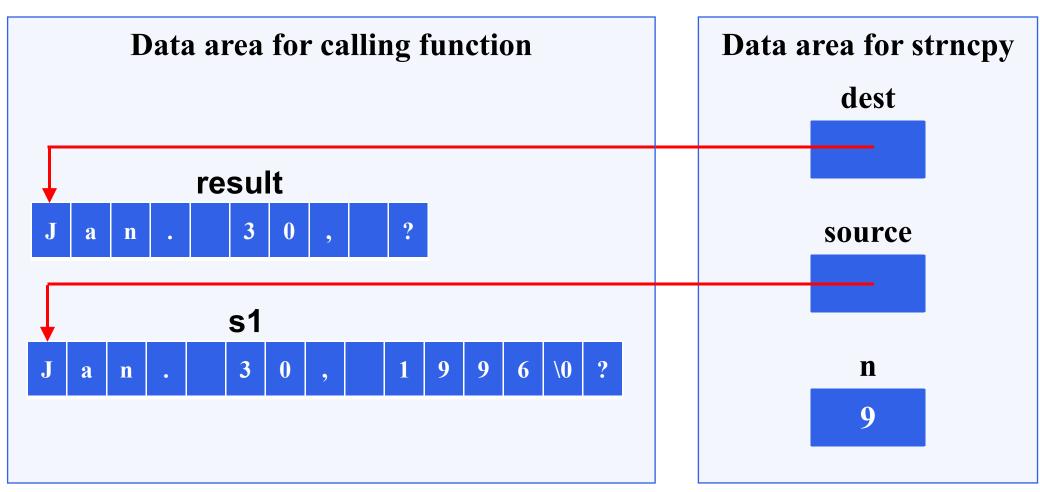
Programming with C I

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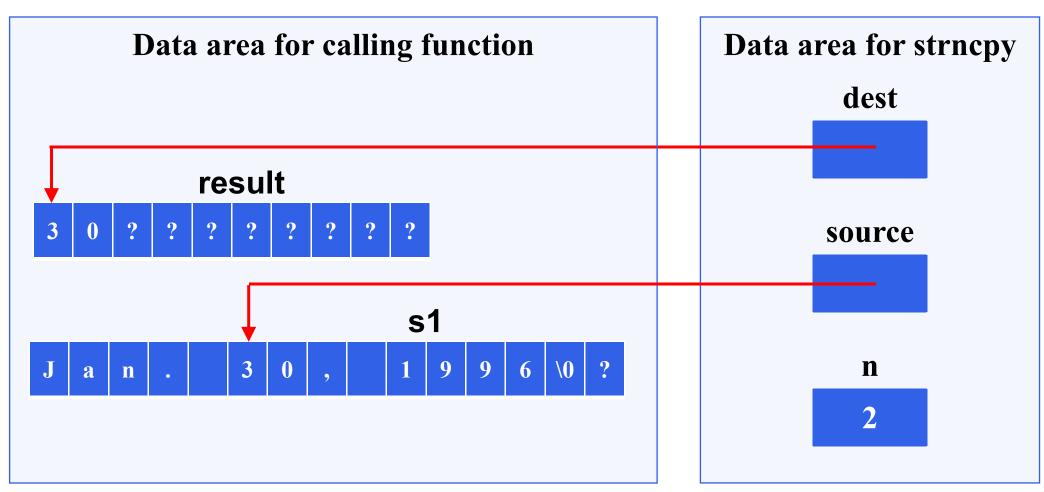
Substrings

Figure Execution of strncpy(result, s1, 9);



Substrings

Figure Execution of strncpy(result, &s1[5], 2);



Substrings

```
char last [20], first [20], middle [20];
             char pres[20] = "Adams, John Quincy";
strncpy (last, pres, 5);
                                                    strcpy (middle, &pres[12]);
last[5] = '\0';
                               strncpy (first, &pres[7], 4);
                               first[4] = '\0';
```

Buffer Overflow

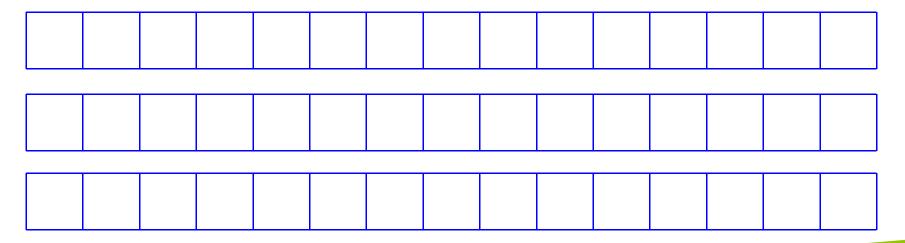
- more data is stored in an array than its declared size allows
- a very dangerous condition
- unlikely to be flagged as an error by either the compiler or the run-time system

```
char string[8] = "hello world";
h e l l o w o r l d \0
```

strcat

- appends source to the end of dest
- assumes that sufficient space is allocated for the first argument to allow addition of the extra characters
 - > s1 = "hello";
 - strcat(s1, "and more");





J	0	h	n		\0							
J	a	c	q	u	e	l	i	n	e	\0		
K	e	n	n	e	d	y	\0					

J	0	h	n		K	e	n	n	e	d	y	\0	
J	a	c	q	u	e	l	i	n	e		\0		
K	e	n	n	e	d	y	\0						

overflow!

strncat

- appends up to n characters of source to the end of dest, adding the null character if necessary
- assumes that sufficient space is allocated for the first argument to allow addition of the extra characters
 - > s1 = "hello";
 - strncat(s1, "and more", 5);







THE END

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