

String in C

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Problem

- How much are oranges?
 - We have a table of items and prices
 - Scanning the table from the top to find “orange” would be too slow

apple	60
peer	70
melon	110
orange	50
avocado	120

○
○
○

String

- week3/3a.c

```
#include <stdio.h>
int main {
    int i;
    char c;

    i = 1;
    c = 'a';

    printf("%p %d %p %c\n", &i, i, &c, c);
    // you will see something like
    // "0x5f94, 1, 0x5f98, a"

    char *cp;
    cp = &c;
    printf("%p %p %c\n", &cp, cp, *cp);
    // you will see something like
    // 0x5ff4, 0x5f98, a

    printf("%d\n", c);
    // you will see 97
}
```

0x5f94	0x5f98	0x5ff4	
1	'a'	0x5f98	

String

- week3/3b.c

```
#include <stdio.h>
```

```
int
```

```
main()
```

```
{
```

```
    char foo[4];
```

```
    char *p;
```

```
    foo[0] = 'a';
```

```
    foo[1] = 'b';
```

```
    foo[2] = 'z';
```

```
    foo[3] = '\0';
```

```
    printf("foo %s\n", foo);
```

```
    printf("foo[0] %c foo[1] %c\n", foo[0], foo[1]);
```

```
    p = foo;
```

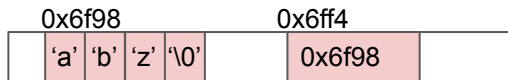
```
    printf("p %p foo %p *p %c\n", p, foo, *p);
```

```
    p = &foo[1];
```

```
    printf("*p %c\n", *p);
```

```
    return 0;
```

```
}
```



Key value store

- week3/3c.c
- Find the price of item
- Algorithm (find kiwi)
 - Pick the first row
 - Compare the 1st character of the row and “kiwi”
If they match, do so for 2nd character and continue
 - If all the characters match, return the value in the 10th byte
 - If unmatched, go to the next row

char keys[7][10]

a	p	p	l	e	\0				60
o	r	a	n	g	e	\0			70
k	i	w	i	\0					110
b	a	n	a	n	a	\0			50
l	i	m	e	\0					70
m	e	l	o	n	\0				120
p	e	a	r	\0					100

Hash table

- week3/3d.c
- Let's make it scalable
- A character is just a number
 - e.g., 'a'=> 97
- Get some value within a range (e.g., 0-127) for an item key
 - "kiwi"
 - $(107 + 105 + 119 + 105) \% 128$
- Use that value as index of an array
- We can reach the target table row without search!

