Lesson 6: String

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fgets

- Input ABCD

A	B	C	D	\n	\0

- Input ABCDE or ABCDEFG

A	B	C	D	E	\0

```
char str[6];
int len;
fgets(str, sizeof(str), stdin);
len=strlen(str);
if (str[len-1]=='\n')
  str[len-1]='\0';
```

strcmp

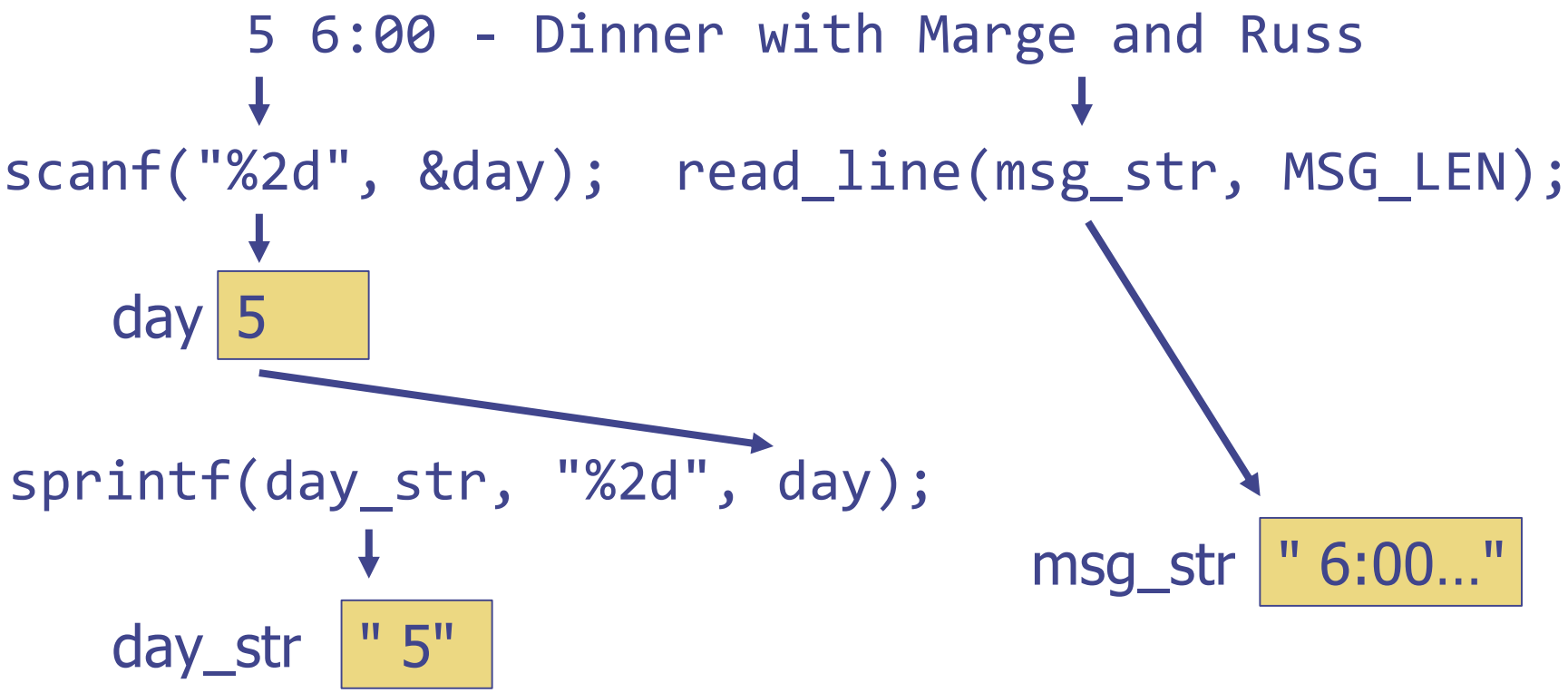
- ASCII Code
  - 0~9: 0x30~0x39 (48~57 in decimal)
  - A~Z: 0x41~0x5A (65~90 in decimal)
  - a~z: 0x61~0x7A (61~122 in decimal)

```c
#include <stdio.h>
int main(void)
{
  printf("%d\n",strcmp("ABC", "abc"));
  printf("%d\n",strcmp("aBc", "abC"));
  printf("%d\n",strcmp("abc","abcd"));
  return 0;
}
```

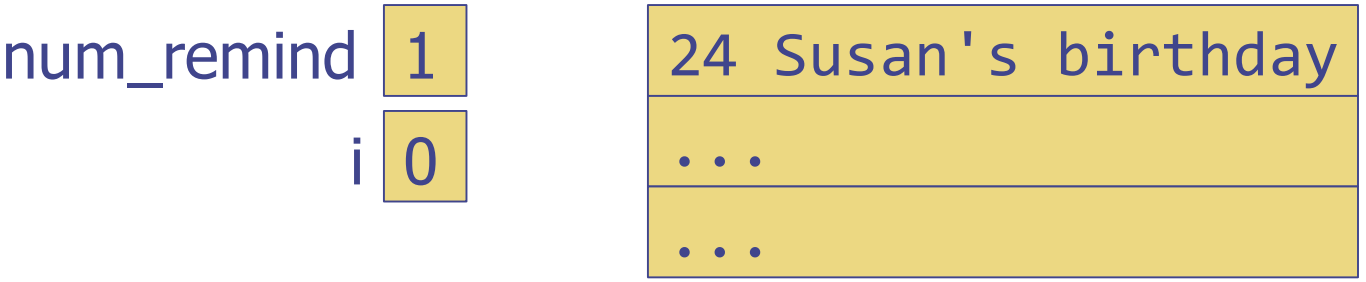
```
-1
-1
-1
```

remind.c

- User input

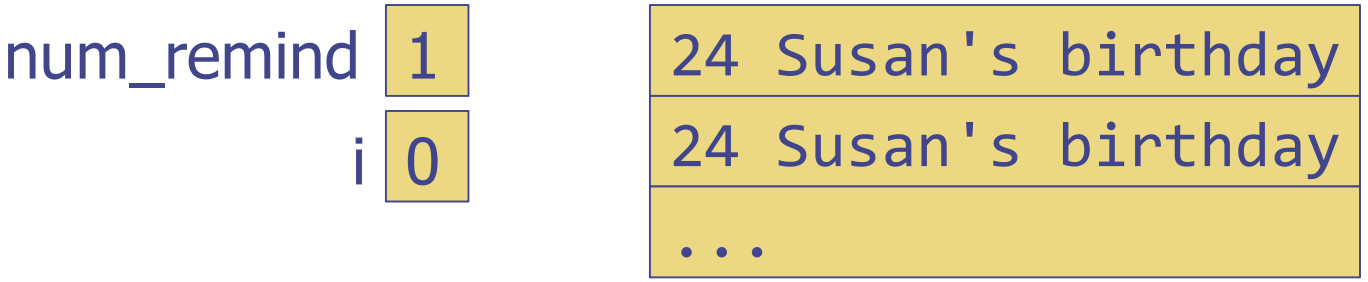


```
for (i = 0; i < num_remind; i++)
      if (strcmp(day_str, reminders[i]) < 0)
        break;
```

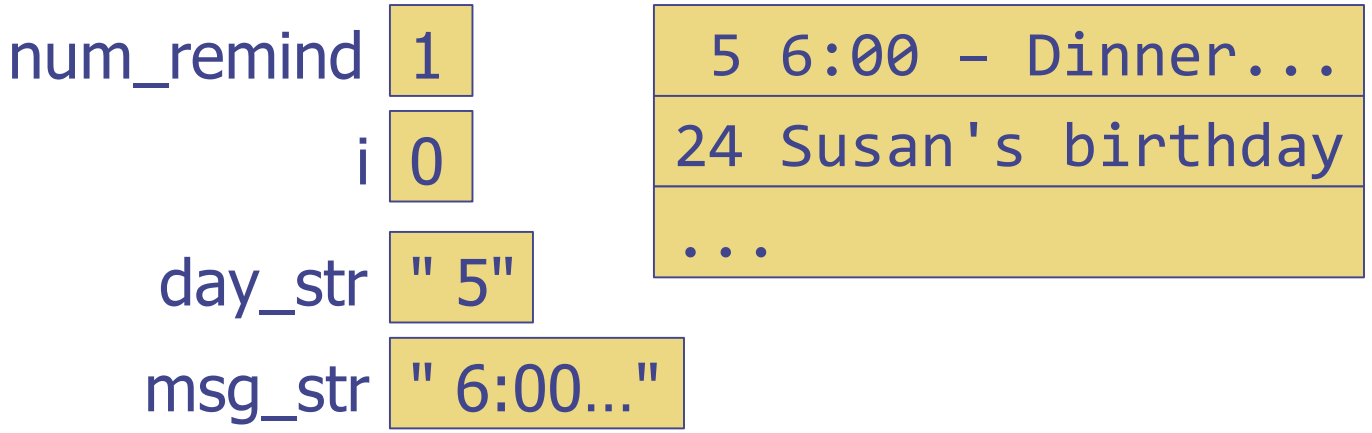


ASCII Code:
Space: 0x20
2: 0x32

```
for (j = num_remind; j > i; j--)
      strcpy(reminders[j], reminders[j-1])
```



```
strcpy(reminders[i], day_str);
strcat(reminders[i], msg_str);
```



strtok

- There is a static variable in the function strtok.
  - char * strtok (char *s, const char *delim);

```
#include <string.h>
char str[]="++AA--BB++";
int main(void)
{
  char *p;
  p=strtok(str,"+-");
  p=strtok(NULL,"+-");
  return 0;
}
```

C (gcc 4.8, C11)
(known limitations)

```
1  #include <string.h>
2
3  char str[]="++AA--BB++";
4
5  int main(void)
6  {
7    char *p;
8    p=strtok(str,"+-");
9    p=strtok(NULL,"+-");
10   return 0;
11 }
```

Stack

Global variables

str — array

0	1	2	3	4	5	6	7	8	9	10
char '+'	char '+'	char 'A'	char 'A'	char '-'	char '-'	char 'B'	char 'B'	char '+'	char '+'	char '\0'

main

p — pointer ?

C (gcc 4.8, C11)
(known limitations)

```
1  #include <string.h>
2
3  char str[]="++AA--BB++";
4
5  int main(void)
6  {
7    char *p;
8    p=strtok(str,"+-");
9    p=strtok(NULL,"+-");
10   return 0;
11 }
```

Stack

Global variables

str

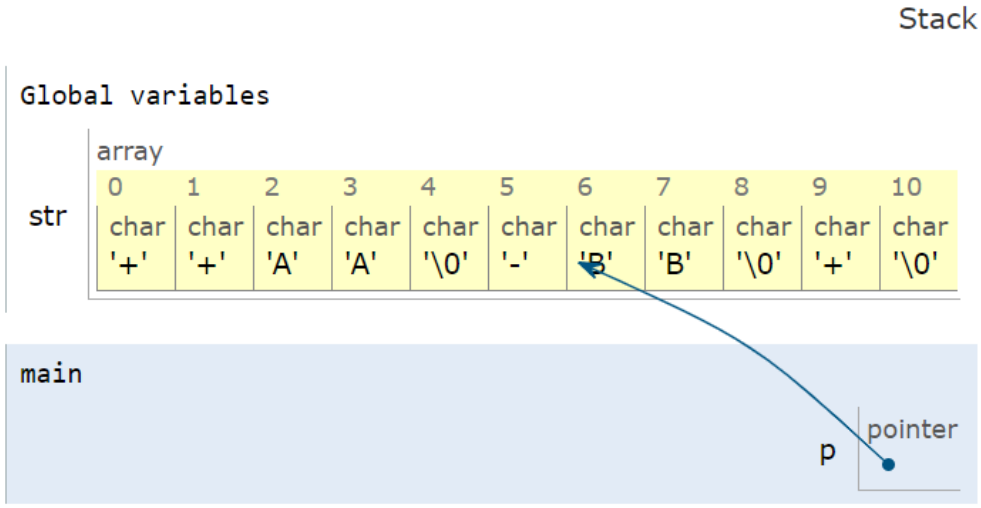
	0	1	2	3	4	5	6	7	8	9	10
array	char '+'	char '+'	char 'A'	char 'A'	char '\0'	char '-'	char 'B'	char 'B'	char '+'	char '+'	char '\0'

main

p (pointer)

C (gcc 4.8, C11)
(known limitations)

```
1  #include <string.h>
2
3  char str[]="++AA--BB++";
4
5  int main(void)
6  {
7    char *p;
8    p=strtok(str,"+-");
9    p=strtok(NULL,"+-");
10   return 0;
11 }
```



- Problem of strtok
  - strtok cannot be used to tokenize multiple strings simultaneously.
- Solution
  - Use strtok_r
  - char * strtok_r (char *s, const char *delim, char **save_ptr);

```
#include <string.h>
#include <stdio.h>
char str1[]="++AA--BB++";
char str2[]="++CC--DD++";
int main(void)
{
  printf("%s\n",strtok(str1,"+-"));
  printf("%s\n",strtok(str2,"+-"));
  // Get the second token from str2.
  printf("%s\n",strtok(NULL,"+-"));
  // We would like to get the second token from str1.
  // However, we get the third token from str2.
  // And, there is no the third token in str2.
  printf("%s\n",strtok(NULL,"+-"));
  return 0;
}
```

```
AA
CC
DD
```

strtok_r

```
#include <string.h>
#include <stdio.h>
char str1[]="++AA--BB++";
char str2[]="++CC--DD++";
int main(void)
{
  char *p, *q;
  printf("%s\n",strtok_r(str1,"+-",&p));
  printf("%s\n",strtok_r(str2,"+-",&q));
  // Get the second token from str2.
  printf("%s\n",strtok_r(p,"+-",&p));
  // We would like to get the second token from str1.
  // However, we get the third token from str2.
  // And, there is no the third token in str2.
  printf("%s\n",strtok_r(q,"+-",&q));
  return 0;
}
```

```
AA
CC
BB
DD
```