

ED1021 - Introduction to computation and visualisation

L14 - Strings (basically character arrays)

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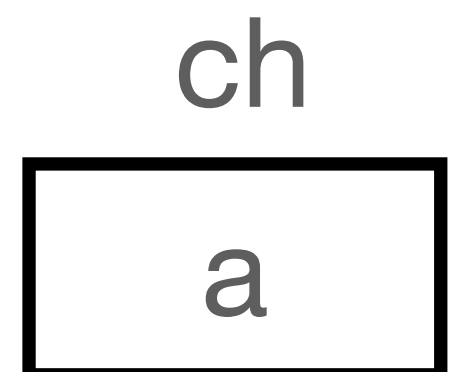
Course web page: <https://ed.iitm.ac.in/~raman/introcomp.html>

Moodle page: Available at <https://courses.iitm.ac.in/>

Declaring an array variable

- `char ch;`
 - `ch` is a variable of character type, i.e., it can take only characters / letters.
 - `ch = 'a';` (single straight quotes, not ```, `“`)
 - format specifier to be used is `%c`

ch
a

A diagram illustrating a character variable. It consists of a rectangular box with a black border. Inside the box, the lowercase letter 'a' is centered. Above the box, the variable name 'ch' is written in a plain, black, sans-serif font.

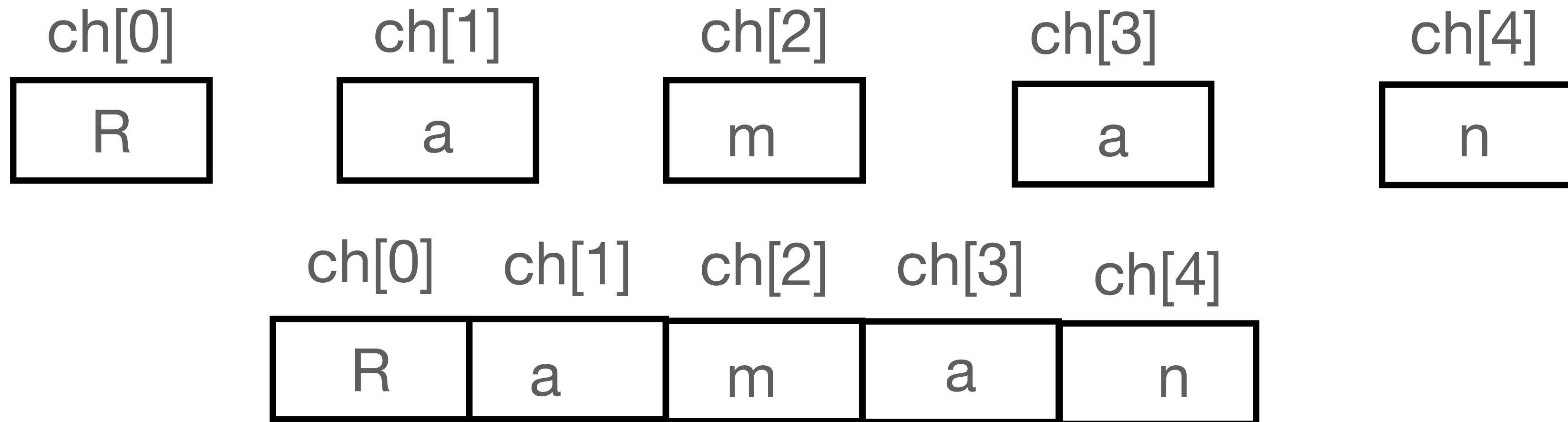
Example program

```
#include <stdio.h>

int main( )
{
    char ch;
    scanf("%c", &ch);
    printf("%d\n", ch);
}
```

character array or array of characters

- `char name[5];`
 - name is an array variable which can take only characters.
 - starting value for array subscript is 0 and end is one less than its size.



Example program

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

```
int main( )
```

```
{
```

```
    char name[5], name1[] = {'a', 'e'};
```

```
    for (i =0; i < 5; i++) {
```

```
        scanf("%c", &name[i]);
```

```
        printf("%c\n", name[i]);
```

```
    }
```

```
    for (i =0; i < 2; i++) {
```

```
        printf("%c\n", name1[i]);
```

```
    }
```

```
}
```

Example program

character array but using pointer notation and %s!

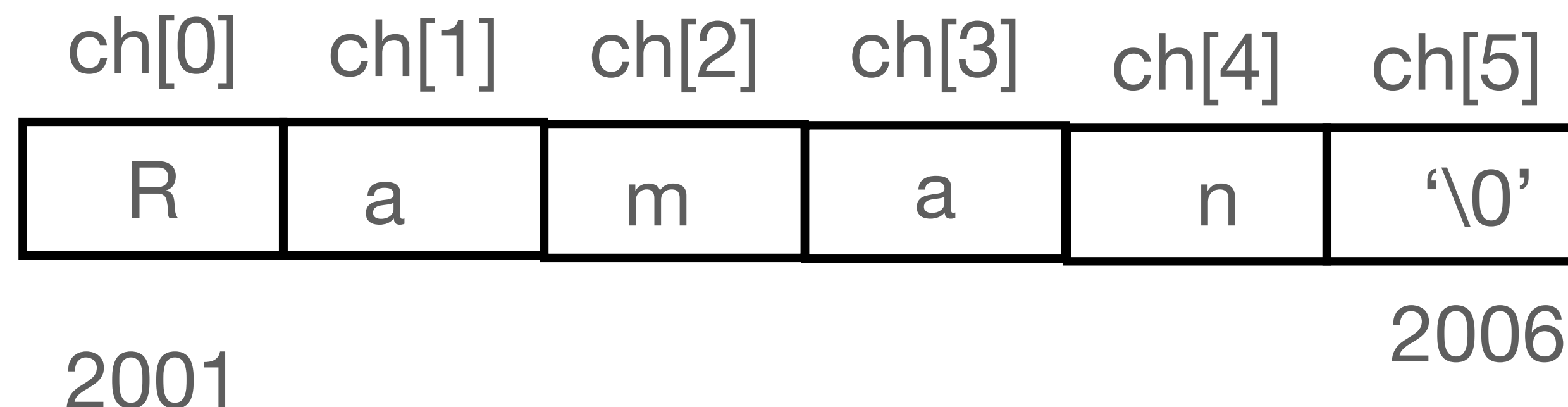
```
#include <stdio.h>

int main( )
{
    char name[6];
    scanf("%s", name);
    printf("%s\n", name);
}
```

What is a string?

character array but using pointer notation and %s!

- `char name[6];`
 - pretty much same as character array but with a trailing null character.
 - null character is represented by `'\0'`.
 - **NOTE: The %s automatically inserts the null character**



Carefully watch the scanf statement so is the printf statement

- `scanf("%s", name);`
 - What can you observe?
 - What is the meaning of 'name of the array'?
 - **NOTE: You won't see the null character in the output.**

ch[0]	ch[1]	ch[2]	ch[3]	ch[4]	ch[5]
R	a	m	a	n	'\0'
2001			2006		

I can also use %c as a set of characters!

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

```
int main( )
```

```
{
```

```
    char name[6];
```

```
    scanf("%s", name);
```

```
    for (i =0; name[i] != '\0'; i++) {
```

```
        printf("%c", name[i]);
```

```
    }
```

```
    printf("\n");
```

```
}
```

**CW: WAP to output your name (a) as a string
(b) as a set of characters.
(c) same as (b) but using pointer notation.**

Passing a string

it's only a pointer anyway

```
#include <stdio.h>
//write prototype here
void changeName(char *name1)
{
    printf("%s", name1);
    scanf("%s", name1);
}
int main( )
{
    char name[6];
    scanf("%s", name);
    printf("%s", name);
    changeName(name);
    printf("%s", name);
}
```

Standard string library

#include <string.h> or #include <stdlib.h>

- strlen
- strcpy etc.
- **NOTE: DO NOT USE the standard library functions unless specifically mentioned.**

CW: WAP to find the length of a string in a UDF.

HW: WAP (UDF's)

- 1) To copy one string to the other.
- 2) Given two strings, check whether they are the same.
- 3) Check if a given string is a palindrome. (i.e., reverse of a string is the string itself, e.g. naman, malayalam etc.). Use the function from (2).