

Character Strings – Q1 (sweepSpace)

Write two versions of a C function that remove all the blank spaces in a sentence.

The first version **sweepSpace1()** will use **array** notation for processing the string, and the other version **sweepSpace2()** will use **pointer** notation.

The function prototypes are given below:

char *sweepSpace1(char *sentence);

// use array notation for accessing array elements

char *sweepSpace2(char *sentence);

// use pointer notation for accessing array elements

Write a C program to test the function.

Sample input and output session:

Enter the string:

i am a boy

sweepSpace1(): iamaboy

sweepSpace2(): iamaboy

Character Strings – Q1 (sweepSpace)

```
#include <stdio.h>
#include <string.h>
char *sweepSpace1(char *sentence);
char *sweepSpace2(char *sentence);
int main()
{
    char str[80], *p;

    printf("Enter the string: \n");
    fgets(str, 80, stdin);
    if (p=strchr(str, '\n')) *p = '\0';
    printf("sweepSpace1(): %s\n", sweepSpace1(str));
    printf("sweepSpace2(): %s\n", sweepSpace2(str));
    return 0;
}
```

Sample input and output session:

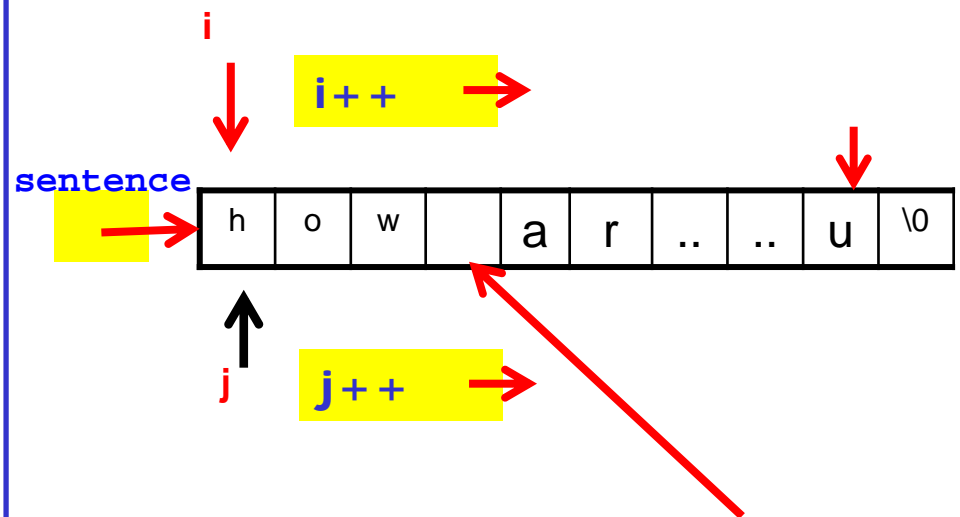
Enter the string:
i am a boy
sweepSpace1(): iamaboy
sweepSpace2(): iamaboy

Character Strings – Q1 (sweepSpace)

Using array index for processing

```
char *sweepSpace1(char *sentence){
    int i, j, len;

    len = strlen(sentence);
    j = 0;
    for ( i=0; i < len; i++){
        if (sentence[i] != ' '){
            sentence[j]=sentence[i];
            j++;
        }
    }
    sentence[j] = '\0';
    return sentence;
}
```



When space is encountered, *i* is updated to move to the next index position, but *j* is not. So space is skipped.

Note:

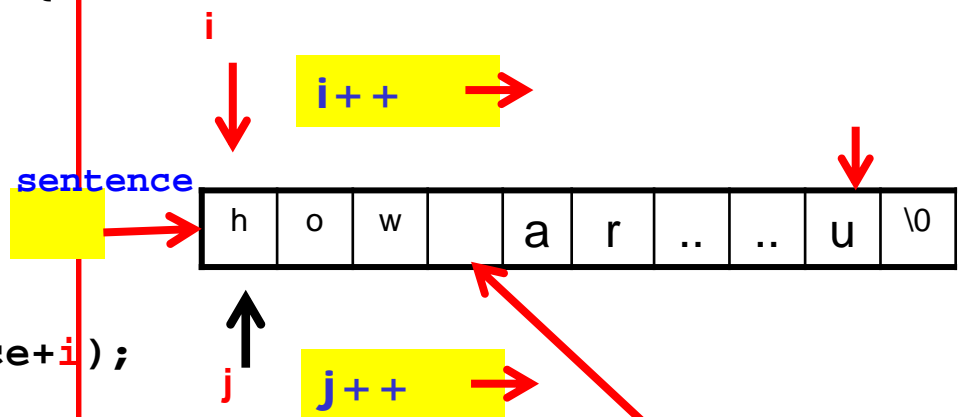
- Traverse each element of the character string using a for loop.
- Using a if statement to update the string if a space is encountered

Character Strings – Q1 (sweepSpace)

Using pointer for processing

```
char *sweepSpace2(char *sentence){
    int i, j, len;

    len = strlen(sentence);
    j = 0;
    for ( i=0; i < len; i++){
        if (*(sentence+i) != ' '){
            *(sentence+j)=*(sentence+i);
            j++;
        }
    }
    *(sentence+j) = '\0';
    return sentence;
}
```



When space is encountered, i is updated to move to the next index position, but j is not. So space is skipped.

Note:

- Traverse each element of the character string using a for loop.
- Using a if statement to update the string if a space is encountered

Character Strings – Q2 (findTarget)

Write a C program that reads and searches character strings. In the program, it contains a function **findTarget()** that searches whether a target name string has been stored in the array of strings. The function prototype is

```
int findTarget(char *target,  
char nameptr[SIZE][80], int size);
```

where *nameptr* is the array of strings entered by the user, *size* is the number of names stored in the array and *target* is the target string.

If the target string is found, the function will return its **index** location, or -1 if otherwise.

In addition, it also contains the function **readNames()** that reads a number of names from the user. The function prototype is given as follows:

```
void readNames(char nameptr[][80], int *size);
```

where *nameptr* is the array of strings to store the input names, and *size* is a pointer parameter which passes the number of names to the caller. Similarly, the function prototype of **printNames()** is given as follows:

```
void printNames(char nameptr[][80], int size);
```

Sample input and output sessions:

Enter size:

4

Enter 4 names:

Peter Paul John Mary

Enter target name:

John

findTarget(): 2

Enter size:

5

Enter 5 names:

Peter Paul John Mary Vincent

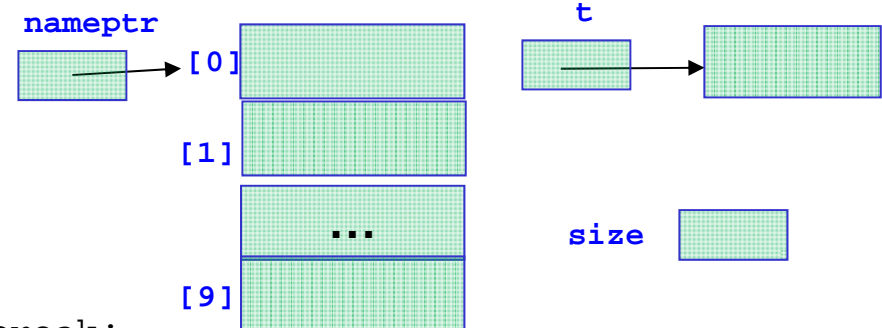
Enter target name:

Jane

findTarget(): -1

Character Strings – Q2 (findTarget)

```
#include <stdio.h>
#include <string.h>
#define SIZE 10
#define INIT_VALUE 999
void printNames(char nameptr[][80], int size);
void readNames(char nameptr[][80], int *size);
int findTarget(char *target, char nameptr[][80], int size);
int main(){
    char nameptr[SIZE][80], t[40], *p;
    int size, result = INIT_VALUE;
    int choice;
    printf("Select one of the following options: \n");
    printf("1: readNames()\n");
    printf("2: findTarget()\n");
    printf("3: printNames()\n");
    printf("4: exit()\n");
    do {
        printf("Enter your choice: \n");
        scanf("%d", &choice);
        switch (choice) {
            case 1: readNames(nameptr, &size); break;
            case 2: printf("Enter target name: \n");
                    scanf("\n");
                    fgets(t, 80, stdin);
                    if (p=strchr(t, '\n')) *p = '\0';
                    result = findTarget(t, nameptr, size);
                    printf("findTarget(): %d\n", result);
                    break;
            case 3: printNames(nameptr, size);
                    break;}
    } while (choice < 4);
    return 0;}
```

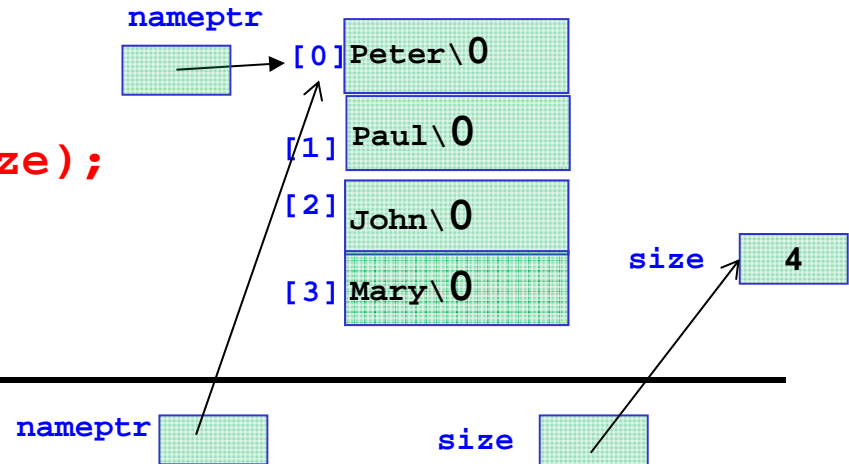


Character Strings – Q2 (findTarget)

```
int main(){
```

```
    case 1: readNames(nameptr, &size);
```

```
}
```



```
void readNames(char nameptr[][80], int *size)
```

```
{
```

```
    int i;
```

```
    printf("Enter size: \n");
```

```
    scanf("%d", size);
```

```
    printf("Enter %d names: \n", *size);
```

```
    for (i=0; i < *size; i++)
```

```
        scanf("%s", nameptr[i]);
```

```
}
```

Character Strings – Q2 (findTarget)

```
int main(){
```

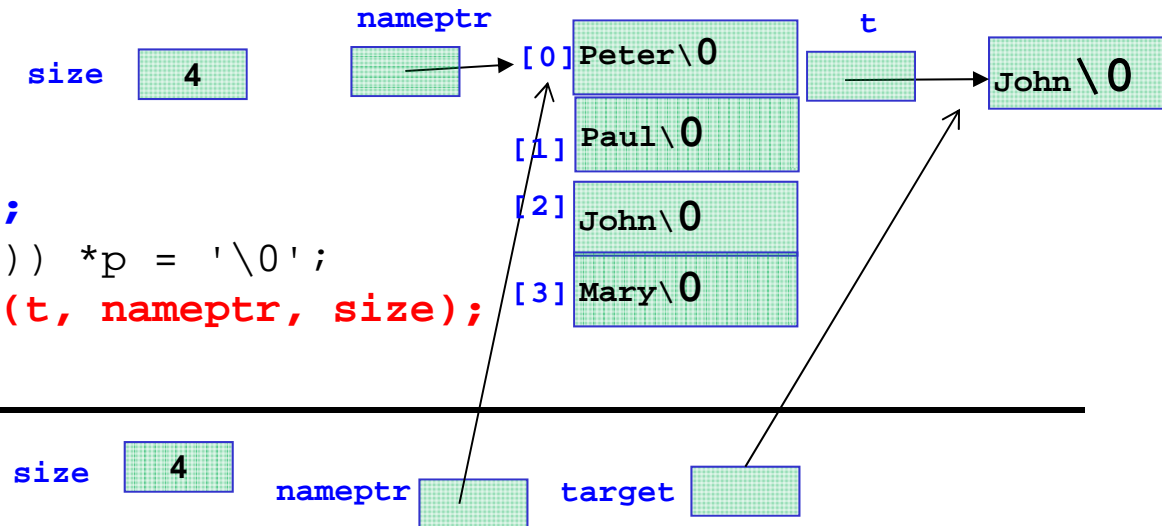
```
    case 2:
```

```
        fgets(t, 80, stdin);
```

```
        if (p=strchr(t, '\n')) *p = '\0';
```

```
        result = findTarget(t, nameptr, size);
```

```
    }
```



```
int findTarget(char *target, char nameptr[SIZE][80], int size)
{
    int i;

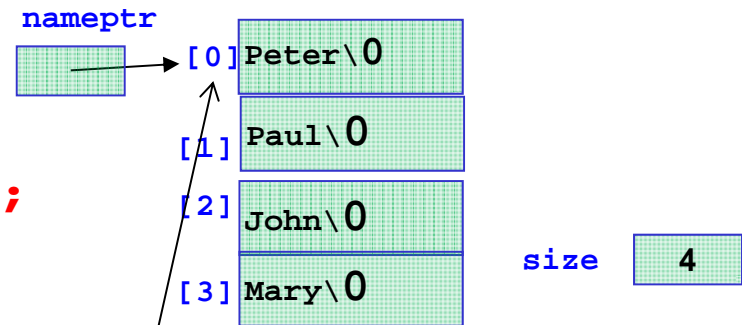
    for (i=0; i < size; i++) {
        if (strcmp(nameptr[i], target) == 0)
            return i;
    }
    return -1;
}
```


Character Strings – Q2 (findTarget)

```
int main(){
```

```
    case 3: printNames(nameptr, size);
```

```
}
```



```
void printNames(char nameptr[][80], int size)
{
    int i;

    for (i=0; i<size; i++)
        printf("%s ", nameptr[i]);
    printf("\n");
}
```

Character Strings – Q3 (palindrome)

Write a function `palindrome()` that reads a character string and determines whether or not it is a palindrome.

A palindrome is a sequence of characters that reads the same forwards and backwards.

For example, "abba" and "abcba" are palindromes, but "abcd" is not.

The function returns 1 if it is palindrome, or 0 if otherwise.

The function prototype is given as follows:

```
int palindrome(char *str);
```

Write a C program to test the function.

Sample input and output sessions:

Test Case 1:

Enter a string:

abcba

palindrome(): A palindrome

Test Case 2:

Enter a string:

abba

palindrome(): A palindrome

Test Case 3:

Enter a string:

abcde

palindrome(): Not a palindrome

Test Case 4:

Enter a string:

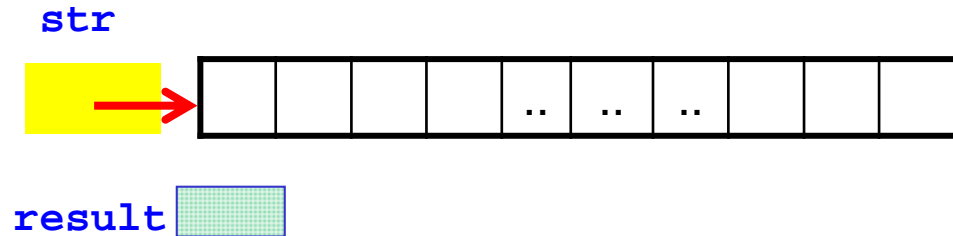
abb a

palindrome(): Not a palindrome

Character Strings – Q3 (palindrome)

```
#include <stdio.h>
#include <string.h>
#define INIT_VALUE -1000
int palindrome(char *str);
int main()
{
    char str[80], *p;
    int result = INIT_VALUE;

    printf("Enter a string: \n");
    fgets(str, 80, stdin);
    if (p=strchr(str, '\n')) *p = '\0';
    result = palindrome(str);
    if (result == 1)
        printf("palindrome(): A palindrome\n");
    else if (result == 0)
        printf("palindrome(): Not a palindrome\n");
    else
        printf("An error\n");
    return 0;
}
```



Character Strings – Q3 (palindrome)

