

Programming Lab Report

Vivid Padungkiatsakul 6601023620026¹

¹Robotic Engineering and Automation System, Faculty of Engineering, King
Mongkut's University of Technology North Bangkok

[010243107] C Programming 2023

Lab Week 7

String

Topic

- String
-

Experiment I

1 Problem description

- Write a program that stores your name in a string and displays a welcome message.
- Ex. Welcome John Smith.

2 Program design

- So, we collect name in `Name[]` variable
- We can set the length in any length depend on how long is your name (In this case we don't set the length for easy to edit or change the value in variable).

3 Program text

```
#include <stdio.h>
char Name[] = "Vivid Padungkiatsakul";

int main(){
    printf("Welcome %s", Name);
}
```

4 Terminal output

```
Welcome Vivid Padungkiatsakul
```

Experiment II

1 Problem description

- Write a program that gets your information by using scanf. The information are as follows:
 - Student name
 - Student surname
 - Student ID
 - Department
 - Gender
 - Age
- Then, display all information on the screen.

2 Program design

- In this case, we can do in 2D array but we will collect in own variable for easy to view and edit.
- We include string.h for using more functions to edit the string.
- For the Department, we will get this information from Student ID. In KMUTNB, the 6-8 numbers of Student ID is telling that what department that you in. For me, I in Department of **Production and Robotic Engineering**, So, the code will be "**236**" and "**216**" but for easy we will use only "**236**" to check.
- For the compare code and get department, We will use DepartmentCheck() function.
- The function work by getting the 6-8 of ID and compare to Department code. if it true, the return that department name.

Part 3: Program text is on the next page.

3 Program text

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

char Fname[50], Sname[50], ID[14], Department[], Gender[2], Age[3];

const char *DepartmentCheck(char ID[]) {
    static char DepartmentCode[4];
    for (int i = 0; i < 3; ++i) {
        DepartmentCode[i] = ID[i + 5];
    }
    DepartmentCode[3] = '\0';

    if (strcmp(DepartmentCode, "236") == 0) {
        return "Production and Robotic Engineering";
    } else {
        return "Unknown Department";
    }
}

int main(){
    printf("Name & ID: ");
    scanf("%s %s %14s", Fname, Sname, ID);
    const *Department = DepartmentCheck(ID);
    printf("Gender [M/F] & Age: ");
    scanf("%s %s", Gender, Age);
    printf("Name: %s\nSurname: %s\nID: %s\nDepartment: %s\nGender: %s\nAge: %s",
        Fname, Sname, ID, Department, Gender, Age);
}
```

4 Terminal output

```
Name & ID: Vivid Padungkiatsakul 6601023620026
Gender [M/F] & Age: M 19
Name: Vivid
Surname: Padungkiatsakul
ID: 6601023620026
Department: Production and Robotic Engineering
Gender: M
Age: 19
```

Experiment III

1 Problem description

- By using array of string, write a program that gets information of 3 students from user and displays
 - Student name
 - Student surname
 - Student ID

2 Program design

- In this case, we can collect in 3D array where the plane and row is row and column of the student data and the column is how long of the string
- For getting student data, we use `UserInputMatrix()` function.
- The `UserInputMatrix()` function takes user input to populate a 3D matrix. The function uses nested loops to iterate over each element of the matrix, prompting the user to enter a value for each element. The matrix size is determined by the column and row parameters that are fix.
- For output student data, we use `StdOutput()` function.
- The `StdOutput()` function prints student data from 3D array.

Part 3: Program text is on the next page.

3 Program text

```
#include <stdio.h>
#define MAXLENGHT 50

char Std[3][3][MAXLENGHT];
int plane = sizeof(Std)/sizeof(Std[0]);
int row = sizeof(Std[0])/sizeof(Std[0][0]);
int column = sizeof(Std[0][0])/sizeof(Std[0][0][0]);
int i,j,k;

void UserInputMatrix(char matrix[plane][row][column]) {
    for (i = 0; i < plane; i++) {
        printf("\nEnter details for student %d:\n", i + 1);
        printf("Enter student name: ");
        scanf("%s", matrix[i][0]);
        printf("Enter student surname: ");
        scanf("%s", matrix[i][1]);
        printf("Enter student ID: ");
        scanf("%s", matrix[i][2]);
    }
}

void StdOutput(char matrix[plane][row][column]){
    for (i = 0; i < plane; i++) {
        printf("\nDetails for student %d:\n", i + 1);
        printf("Name: %s\n", matrix[i][0]);
        printf("Surname: %s\n", matrix[i][1]);
        printf("ID: %s\n", matrix[i][2]);
    }
}

int main(){
    UserInputMatrix(Std);
    StdOutput(Std);
}
```

4 Terminal output

```
Enter details for student 1:
Enter student name: Test1
Enter student surname: STest1
Enter student ID: 111

Enter details for student 2:
Enter student name: Test2
Enter student surname: STest2
Enter student ID: 222

Enter details for student 3:
Enter student name: Test3
Enter student surname: STest3
Enter student ID: 333

Details for student 1:
Name: Test1
Surname: STest1
ID: 111

Details for student 2:
```

```
Name: Test2  
Surname: STest2  
ID: 222
```

```
Details for student 3:  
Name: Test3  
Surname: Stest3  
ID: 333
```

Experiment IV

1 Problem description

- Given 2 strings: "King" and "Mongkut".
- Write a program that
 - combine the strings (result should be "King Mongkut")
 - compare them.
 - copy "King" to "Mongkut".

2 Program design

- For this case, we will create the char variable for collect "King" and "Mongkut"
- For combine we will copy to other variable called CombineStr.
- In compare string 1 and 2, we will try to see is that the same and the position. So, we will compare and get the value and compare to 0.

3 Program text

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

char String1[] = "King";
char String2[] = "Mongkut";

char CombineStr[20];

int main() {
    strcpy(CombineStr, String1);
    strcat(CombineStr, " ");
    strcat(CombineStr, String2);

    printf("String1[%s] + String2[%s]: %s\n", String1, String2, CombineStr);
    printf("Compare String1[%s] to String2[%s]: %d (%d)\n", String1, String2, strcmp(
        String1, String2) == 0, strcmp(String1, String2));
    printf("Copy String1[%s] to String2[%s]: %s\n", String1, String2, strcpy(String2,
        String1));
}
```

4 Terminal output

```
String1[King] + String2[Mongkut]: King Mongkut
Compare String1[King] to String2[Mongkut]: 0 (-1)
Copy String1[King] to String2[King]: King
```