



AWESH ISLAM
BUET, CSE

BATCH RECURSION C AND C++ PROGRAMMING MASTERCLASS

Class-01



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<https://www.hsccrackers.com/>



SCAN ME

All About Arrays & Strings

Solution

```
1 #include <stdio.h>
2
3 int main() {
4
5     double first_year_cg = 3.5;
6     double second_year_cg = 3.7;
7     double third_year_cg = 3.9;
8     double fourth_year_cg = 3.6;
9
10    double first_year_credit = 22;
11    double second_year_credit = 20;
12    double third_year_credit = 18;
13    double fourth_year_credit = 17;
14
15    double summation = first_year_cg*first_year_credit + second_year_cg*second_year_credit +
16                    third_year_cg*third_year_credit + fourth_year_cg*fourth_year_credit;
17
18    double total_credit = first_year_credit + second_year_credit + third_year_credit + fourth_year_credit;
19
20    double average_cg = summation/total_credit;
21
22    printf("%lf\n",average_cg);
23
24    return 0;
25 }
```

Array Basic

```
1 #include <stdio.h>
2 int main(){
3     int number = 10;
4     //How to declare
5     int numbers[10] = {3,4,1,6,32,34,3,4,5,6};
6     int numbers2[10] = {0};
7
8     //How to access (change and print)
9     printf("%d\n",numbers[0]);
10    scanf("%d",&numbers[0]);
11    numbers[1] = 10;
12    printf("%d %d\n",numbers[0],numbers[1]);
13    printf("%d\n",numbers[2]);
14
15    //How to iterate
16    for(int i = 0;i < sizeof(numbers2)/sizeof(int);i++){
17        printf("%d\n",numbers2[i]);
18    }
19    for(int i = 0;i < sizeof(numbers2)/sizeof(int);i++){
20        numbers2[i] += 10;
21    }
22    for(int i = 0;i < sizeof(numbers2)/sizeof(int);i++){
23        printf("%d\n",numbers2[i]);
24    }
25 }
```

Array Copying

```
1 #include <stdio.h>
2 int main(){
3     int array1[5] = {1,2,3,4,5};
4     int array2[5];
5     for(int i = 0; i < sizeof(array1)/sizeof(int);i++){
6         array2[i] = array1[i];
7     }
8     for(int i = 0; i < sizeof(array2)/sizeof(int);i++){
9         printf("%d\n",array2[i]);
10    }
11 }
```

Swap

```
1 #include <stdio.h>
2
3 int main(){
4     int a = 10;
5     int b = 20;
6     int temp;
7
8     /*Wrong*/
9 //     a = b;
10 //    b = a;
11 //    printf("%d %d",a,b);
12
13     temp = a;
14     a = b;
15     b = temp;
16     printf("%d %d",a,b);
17 }
```

Array Reversing

```
1 #include <stdio.h>
2
3 int main(){
4     /*wrong*/
5     int arr[5] = {1,2,3,4,5};
6     //     for(int i = 0,j = 4 ;i < 5;i++,j--){
7     //         int temp = arr[i];
8     //         arr[i] = arr[j];
9     //         arr[j] = temp;
10    //     }
11    //     for(int i = 0; i < 5;i++){
12    //         printf("%d\n",arr[i]);
13    //     }
14    for(int i = 0,j = 4 ;i < 3;i++,j--){
15        int temp = arr[i];
16        arr[i] = arr[j];
17        arr[j] = temp;
18    }
19    for(int i = 0; i < 5;i++){
20        printf("%d\n",arr[i]);
21    }
22 }
```

Solution

```
1 #include <stdio.h>
2
3 int main() {
4
5     double first_year_cg[5] = {3.5,4,3.9,3.2,3.1};
6     double second_year_cg[5] = {3.7,4,3.8,3.7,3.4};
7     double third_year_cg[5] = {3.9,4,2.3,3.5,4};
8     double fourth_year_cg[5] = {3.6,4,3.9,3.2,3.5};
9
10    double first_year_credit = 22;
11    double second_year_credit = 20;
12    double third_year_credit = 18;
13    double fourth_year_credit = 17;
14    for(int i = 0; i < 5;i++){
15        double summation = first_year_cg[i]*first_year_credit +
16                      second_year_cg[i]*second_year_credit +
17                      third_year_cg[i]*third_year_credit +
18                      fourth_year_cg[i]*fourth_year_credit;
19
20        double total_credit = first_year_credit + second_year_credit +
21                           third_year_credit + fourth_year_credit;
22
23        double average_cg = summation/total_credit;
24
25        printf("%lf\n",average_cg);
26    }
27
28    return 0;
29 }
```

Linear Search

```
1 #include <stdio.h>
2 int main(){
3     int arr[10] = {32,43,1,42,64,88,2,5,66,23};
4     int key = 44;
5     int i = 0;
6     for(i = 0; i < 10;i++){
7         if(arr[i] == key){
8             printf("%d found\n",key);
9             break;
10        }
11    }
12    if(i == 10) printf("%d not found\n",key);
13 }
```

Bubble Sorting

```
1 #include <stdio.h>
2 int main(){
3     int arr[10] = {32,43,1,42,64,88,2,5,66,23};
4     int i = 0;
5     for(i = 0; i < 10;i++){
6         for(int j = i+1;j < 10;j++){
7             if(arr[i] > arr[j]){
8                 int temp = arr[i];
9                 arr[i] = arr[j];
10                arr[j] = temp;
11            }
12        }
13    }
14    for(int i = 0;i < 10;i++){
15        printf("%d\n",arr[i]);
16    }
17 }
```

Binary Search

```
1 #include <stdio.h>
2 int main(){
3     int arr[10] = {1,23,32,44,53,64,72,78,92,100};
4     int key = 64;
5     int right = 9;
6     int left = 0;
7     int found = 0;
8     while (left <= right) {
9         int mid = (left+right)/2;
10        if(arr[mid] == key){
11            found = 1;
12            break;
13        }
14        else if(arr[mid] < key){
15            left = mid+1;
16        }else if(arr[mid] > key){
17            right = mid-1;
18        }
19    }
20    if(found) printf("%d found.\n",key);
21    else printf("%d not found.\n",key);
22 }
```

Strings

```
1 #include <stdio.h>
2
3 int main() {
4     char country[11] = {'B', 'a', 'n', 'g', 'l', 'a', 'd', 'e', 's', 'h', '\0'};
5     char country1[] = {'B', 'a', 'n', 'g', 'l', 'a', 'd', 'e', 's', 'h', '\0'};
6     char country2[] = "Bangladesh";
7     printf("%s\n",country);
8     printf("%s\n",country1);
9     printf("%s\n",country2);
10
11 }
```

How to find length

```
1 #include <stdio.h>
2 int find_length(char string[]){
3     int i = 0;
4     int length = 0;
5     for(i = 0; string[i] != '\0'; i++) {
6         length++;
7     }
8     return length;
9 }
10 int main() {
11     char country[100];
12     scanf("%s",country);
13     int length = find_length(country);
14     printf("The length of string is: %d\n",length);
15
16 }
```

How to Convert to Uppercase

```
1 #include <stdio.h>
2 int find_length(char string[]){
3     int i = 0;
4     int length = 0;
5     for(i = 0; string[i] != '\0'; i++) {
6         length++;
7     }
8     return length;
9 }
10 int main() {
11     char country[100];
12     scanf("%s",country);
13     int length = find_length(country);
14     for(int i = 0;i < length;i++){
15         if(country[i] >= 'a' && country[i] <= 'z'){
16             country[i] += 'A' - 'a';
17         }
18     }
19     printf("Country in Upper Case : %s\n",country);
20 }
```

How to take more than one word

```
1 #include <stdio.h>
2 int find_length(char string[]){
3     int i = 0;
4     int length = 0;
5     for(i = 0; string[i] != '\0'; i++) {
6         length++;
7     }
8     return length;
9 }
10 int main() {
11     char country[100];
12     gets(country); ⚠ 'gets' is deprecated: This function is provided
13     int length = find_length(country);
14     for(int i = 0;i < length;i++){
15         if(country[i] >= 'a' && country[i] <= 'z'){
16             country[i] += 'A' - 'a';
17         }
18     }
19     printf("Country in Upper Case : %s\n",country);
20 }
```

String Concatenation

```
1 #include <stdio.h>
2 int main(){
3     char str1[] = "Bangla";
4     char str2[] = "Desh";
5     char str3[100];
6     int j = 0;
7     for(int i = 0; str1[i] != '\0'; i++){
8         str3[j] = str1[i];
9         j++;
10    }
11    for(int i = 0; str2[i] != '\0'; i++){
12        str3[j] = str2[i];
13        j++;
14    }
15    printf("%s\n", str3);
16 }
```

String Compare

```
1 #include <stdio.h>
2 int find_length(char string[]){
3     int i = 0;
4     int length = 0;
5     for(i = 0; string[i] != '\0'; i++) {
6         length++;
7     }
8     return length;
9 }
10 int string_compare(char str[],char str1[]){
11     for(int i = 0;str[i] == '\0' || str1[i] == '\0';i++){
12         if(str[i] > str1[i]) return 1;
13         if(str[i] < str1[i]) return -1;
14     }
15     if(find_length(str) > find_length(str1)) return 1;
16     else if(find_length(str) < find_length(str1)) return -1;
17     else return 0;
18 }
19 int main(){
20     char str[] = "equal";
21     char str1[] = "equal";
22     int ans = string_compare(str,str1);
23     printf("%d\n",ans);
24 }
```

Stop the running scheme or application

String.h

```
1 #include <stdio.h>
2 #include <string.h>
3 int main(){
4     char str[1000] = "Bangladesh";
5     char str2[1000] = "is my country";
6     printf("Length of string 1: %d\n", (int)strlen(str));
7     printf("After joining second string with first: %s\n", strcat(str, str2));
8     printf("Returns positive,negative,zero after comparison %d\n", strcmp(str2, str));
9     strcpy(str2, str);
10    printf("Copied 1st string to second: %s\n", str2);
11 }
```

2D Array

```
1 #include <stdio.h>
2 int main(){
3     int arr[3][3] = {{1,2,3},{4,5,6},{7,8,9}};
4     //How to access
5     printf("%d\n",arr[2][0]);
6     //How to change
7     arr[1][1] = 0;
8     //How to iterate
9     for(int i = 0;i < 3;i++){
10         for(int j = 0; j < 3;j++){
11             printf("%d ",arr[i][j]);
12         }
13         printf("\n");
14     }
15 }
```