LAPORAN PRAKTIKUM
PEMROGRAMAN TERSTRUKTUR
PRAKTIKUM I – PENDAHULUAN
KELAS B

Disusun Oleh:
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LABORATURIUM KOMPUTASI
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A. Functions in C

1. Masalah

Objective

In this challenge, you will learn simple usage of functions in C. Functions are a bunch of statements glued together. A function is provided with zero or more arguments, and it executes the statements on it. Based on the return type, it either returns nothing (void) or something.

A sample syntax for a function is

```
        return_type function_name(arg_type_1 arg_1, arg_type_2 arg_2, ...) {
        ...
        ...
        ...
        [if return_type is non void]
                return something of type `return_type`;
    }
```

For example, a function to read four variables and return the sum of them can be written as

```
        int sum_of_four(int a, int b, int c, int d) {
        int sum = 0;
        sum += a;
        sum += b;
        sum += c;
        sum += d;
        return sum;
    }
```

Task

You have to write a function `int max_of_four(int a, int b, int c, int d)` which reads four arguments and returns the greatest of them.

```
+= : Add and assignment operator. It adds the right operand to the left operand and assigns the r

a += b is equivalent to a = a + b;
```

Input Format

Input will contain four integers - a, b, c, d , one in each line.

Output Format

Print the greatest of the four integers.
Note: I/O will be automatically handled.

Sample Input

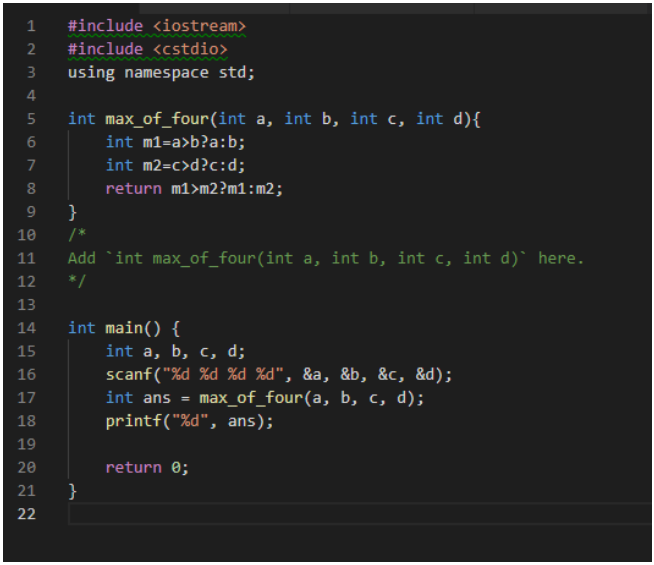
```
3
4
6
5
```

Sample Output

```
6
```

Gambar 1.1(Masalah)

2. Penyelesaian



```
#include <iostream>
#include <cstdio>
using namespace std;

int max_of_four(int a, int b, int c, int d){
    int m1=a>b?a:b;
    int m2=c>d?c:d;
    return m1>m2?m1:m2;
}
/*
Add `int max_of_four(int a, int b, int c, int d)` here.
*/

int main() {
    int a, b, c, d;
    scanf("%d %d %d %d", &a, &b, &c, &d);
    int ans = max_of_four(a, b, c, d);
    printf("%d", ans);

    return 0;
}
```

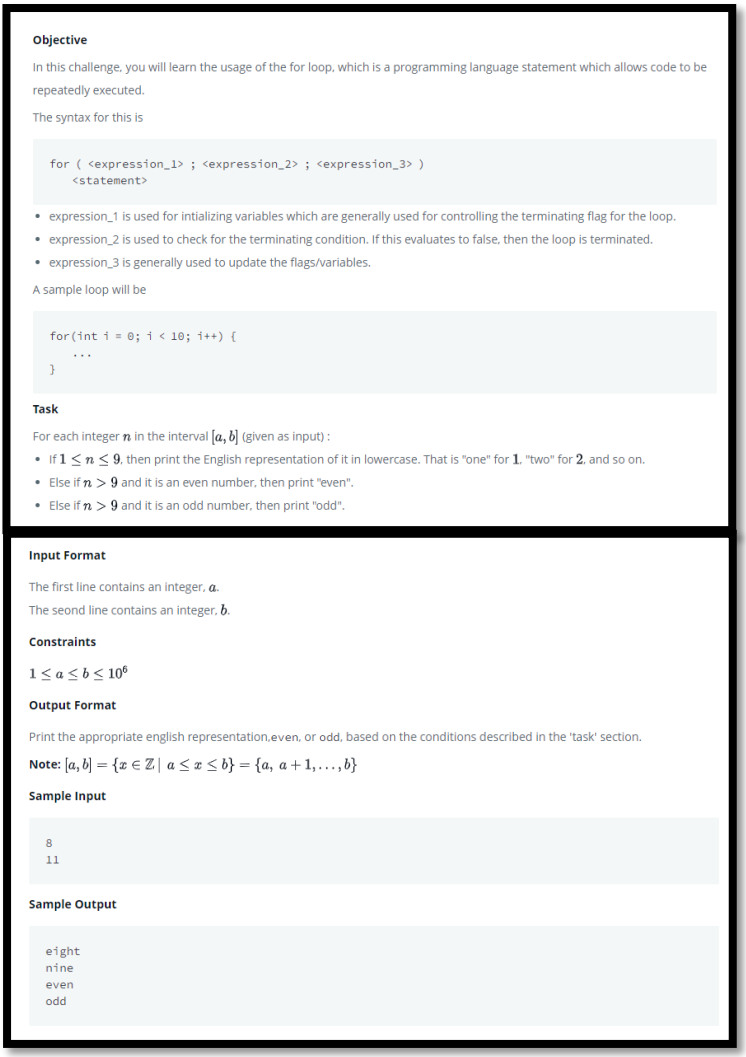
Gambar 1.2 (Kode Program Penyelesaian)

3. Penjelasan

Pada program ini, program dimasukkan diatas integer main. Pada program tersebut dimasukkan input max of four dengan diinisialkan a,b,c,d. hal ini digunakan untuk nilai input. Setelah itu, dimasukkan perintah sesuai keinginan program kita di gambar. Lalu, baru masukan int main untuk memasukkan rumus setelahnya. Kemudian, program di printf untuk menampilkan program di papan terminal. Setelah itu, di return untuk dikembalikan keadaannya.

B. For Loop In C

1. Masalah



Objective

In this challenge, you will learn the usage of the for loop, which is a programming language statement which allows code to be repeatedly executed.

The syntax for this is

```
for ( <expression_1> ; <expression_2> ; <expression_3> )
   <statement>
```

- expression_1 is used for intializing variables which are generally used for controlling the terminating flag for the loop.
- expression_2 is used to check for the terminating condition. If this evaluates to false, then the loop is terminated.
- expression_3 is generally used to update the flags/variables.

A sample loop will be

```
for(int i = 0; i < 10; i++) {
   ...
}
```

Task

For each integer n in the interval $[a, b]$ (given as input) :

- If $1 \leq n \leq 9$, then print the English representation of it in lowercase. That is "one" for 1, "two" for 2, and so on.
- Else if $n > 9$ and it is an even number, then print "even".
- Else if $n > 9$ and it is an odd number, then print "odd".

Input Format

The first line contains an integer, a.

The seond line contains an integer, b.

Constraints

$1 \leq a \leq b \leq 10^6$

Output Format

Print the appropriate english representation,even, or odd, based on the conditions described in the 'task' section.

Note: $[a, b] = \{x \in \mathbb{Z} \mid a \leq x \leq b\} = \{a, a+1, \ldots, b\}$

Sample Input

```
8
11
```

Sample Output

```
eight
nine
even
odd
```

Gambar 2.1(Masalah)

2. Penyelesaian

```c
#include <stdio.h>
#include <string.h>
#include <math.h>
#include <stdlib.h>



int main()
{
    int a, b;
    scanf("%d\n%d", &a, &b);
    // Complete the code.
    char labels[11][6] = {"one","two","three","four","five","six","s
    int labels_index;
    for (int i = a; i <= b; i++) {
      labels_index = i <= 9 ? i - 1 : 9 + i % 2;
      printf("%s\n", labels[labels_index]);
    }
    return 0;
}

```

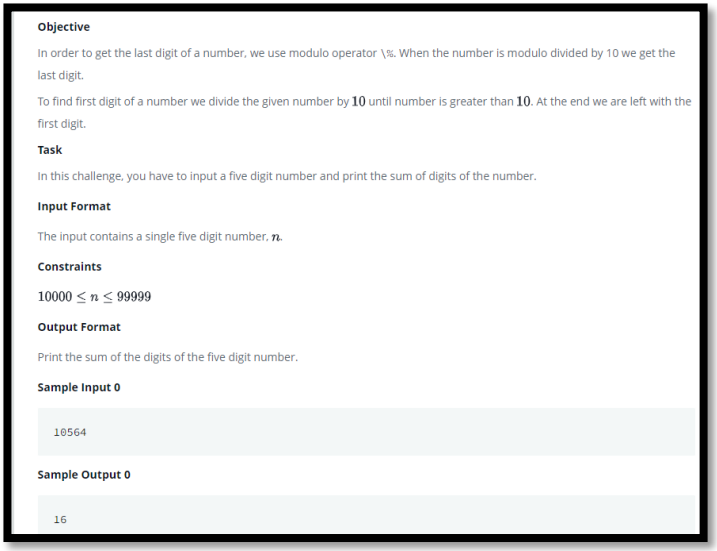
Gambar 2.2 (Kode Program Penyelesaian)

3. Penjelasan

Program diatas berguna sebagai database yang diambil untuk menampilkan huruf dari angka yang dimasukan. Dengan fungsi for untuk mengulang. Dengan masukan 8 dan 11 maka setelah terkena for akan berurutan menjadi 8 9 10 11 lalu akan dirubah menjadi huruf.. Jika huruf itu <=9 maka akan muncul huruf dari angka itu tpi jika lebih dari itu maka akan muncul 'even' untuk angka genap dan 'odd' untuk angka ganjil

C. Sum Of Digits Of A Five Digit Number

1. Masalah



Objective

In order to get the last digit of a number, we use modulo operator \%. When the number is modulo divided by 10 we get the last digit.

To find first digit of a number we divide the given number by 10 until number is greater than 10. At the end we are left with the first digit.

Task

In this challenge, you have to input a five digit number and print the sum of digits of the number.

Input Format

The input contains a single five digit number, n.

Constraints

$10000 \leq n \leq 99999$

Output Format

Print the sum of the digits of the five digit number.

Sample Input 0

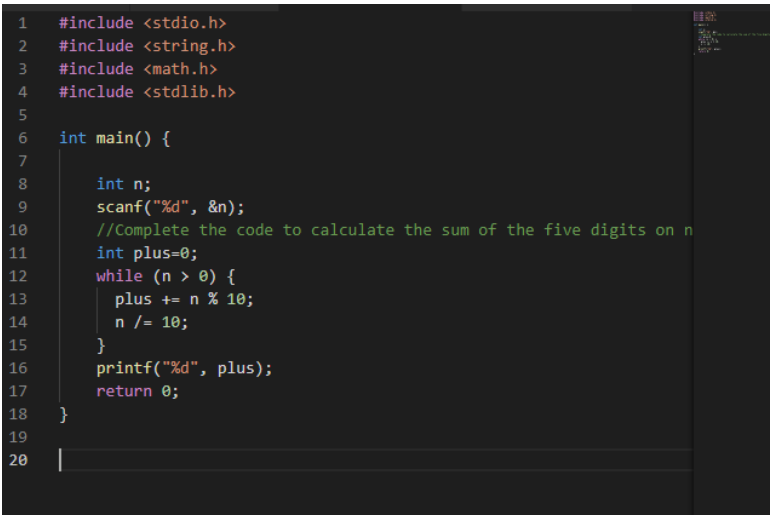
```
10564
```

Sample Output 0

```
16
```

Gambar 3.1(Masalah)

2. Penyelesaian



```c
#include <stdio.h>
#include <string.h>
#include <math.h>
#include <stdlib.h>

int main() {

    int n;
    scanf("%d", &n);
    //Complete the code to calculate the sum of the five digits on n
    int plus=0;
    while (n > 0) {
      plus += n % 10;
      n /= 10;
    }
    printf("%d", plus);
    return 0;
}

```

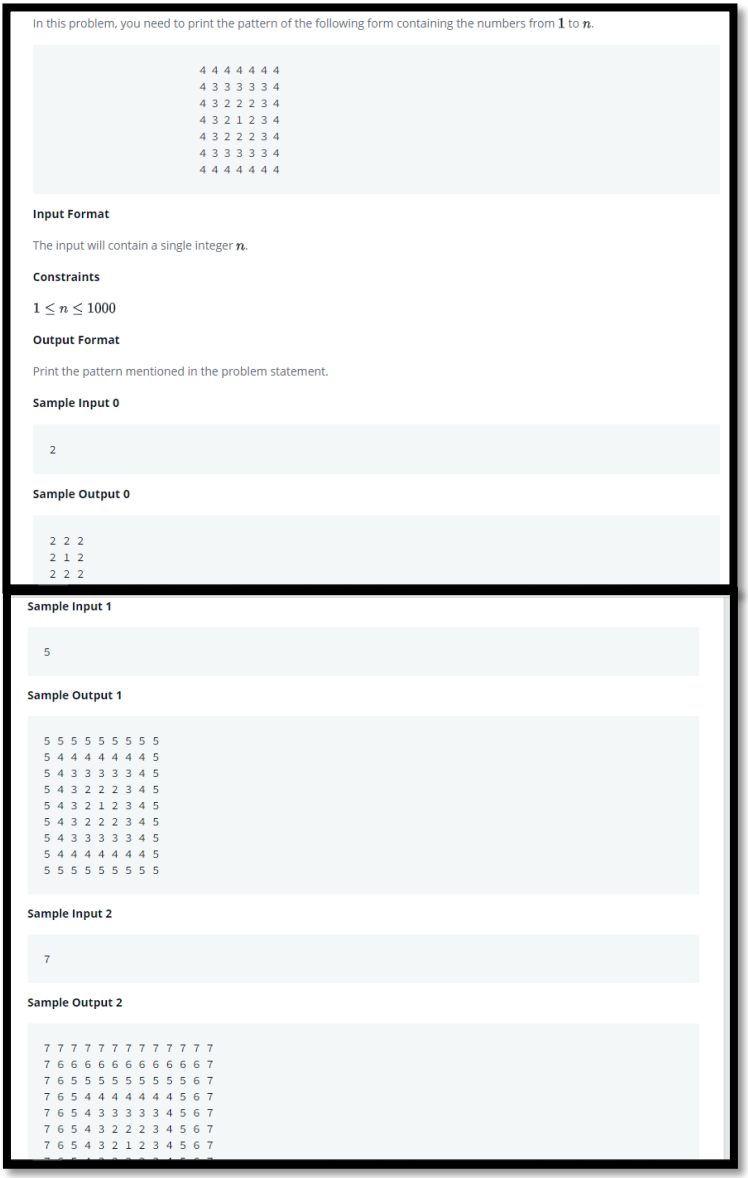
Gambar 3.2 (Kode Program Penyelesaian)

3. Penjelasan

Pada program diatas, input yang digunakan yaitu integer n kemudian diberi perintah scanf agar nilainya bisa langsung dimasukan di papan terminal. Setelah itu, dimasukkan input integer sum untuk penambahan nanti di peintah yang digunakan. Lalu, digunakan perinah while dengan n>0, kemudian didalam peintah while diberi perintah perhitungannya agar didapatkan program yang diinginkan. Setelah itu, programnya di return 0 untuk mengembalikan keadaan semula.

D. Printing Pattern 2

1. Masalah



In this problem, you need to print the pattern of the following form containing the numbers from 1 to n.

```
4 4 4 4 4 4 4
4 3 3 3 3 3 4
4 3 2 2 2 3 4
4 3 2 1 2 3 4
4 3 2 2 2 3 4
4 3 3 3 3 3 4
4 4 4 4 4 4 4
```

Input Format

The input will contain a single integer n.

Constraints

$1 \leq n \leq 1000$

Output Format

Print the pattern mentioned in the problem statement.

Sample Input 0

```
2
```

Sample Output 0

```
2 2 2
2 1 2
2 2 2
```

Sample Input 1

```
5
```

Sample Output 1

```
5 5 5 5 5 5 5 5 5
5 4 4 4 4 4 4 4 5
5 4 3 3 3 3 3 4 5
5 4 3 2 2 2 3 4 5
5 4 3 2 1 2 3 4 5
5 4 3 2 2 2 3 4 5
5 4 3 3 3 3 3 4 5
5 4 4 4 4 4 4 4 5
5 5 5 5 5 5 5 5 5
```

Sample Input 2

```
7
```

Sample Output 2

```
7 7 7 7 7 7 7 7 7 7 7 7 7
7 6 6 6 6 6 6 6 6 6 6 6 7
7 6 5 5 5 5 5 5 5 5 5 6 7
7 6 5 4 4 4 4 4 4 4 5 6 7
7 6 5 4 3 3 3 3 3 4 5 6 7
7 6 5 4 3 2 2 2 3 4 5 6 7
7 6 5 4 3 2 1 2 3 4 5 6 7
```

Gambar 4.1(Masalah)

2. Penyelesaian

```c
#include <stdio.h>
#include <string.h>
#include <math.h>
#include <stdlib.h>

int main()
{

    int n;
    scanf("%d", &n);
    // Complete the code to print the pattern.
    int len = n * 2 - 1;
    for (int i = 0; i < len; i++) {
      for (int j = 0; j < len; j++) {
        int min = i < j ? i : j;
        min = min < len - i ? min : len - i - 1;
        min = min < len - j - 1 ? min : len - j - 1;
        printf("%d ", n - min);
      }
      printf("\n");
    }
    return 0;
}

```

Gambar 4.2 (Kode Program Penyelesaian)

3. Penjelasan

Progam ini akan mencetak patren dengan input 1-n dengan patren yang sudah di sebutkan pada soal