



岐阜工業高等専門学校

第 14 回課題

電子制御工学科：情報処理 I

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1 はじめに

1.1 実行環境

この課題のプログラムは以下の環境で動作することが確認されている：

- OS: Arch Linux
- CPU アーキテクチャ: x86_64
- C コンパイラ: gcc バージョン 14.2.1 20250322 (GCC)
- C コンパイラオプション: -Wall

2 今回の構文

3 for 文

for 文は繰り返しを記述する方法の一つで、1 つの文と 2 つ式で構成される。それぞれの式・文はセミコロンで分けられている。[1]

for 文

```
1 for (<カウンターの初期化文> ; <条件式> ; <反復式>) {  
2     <文>...;  
3 }
```

初期化文、条件式、反復式を全て省略すると無限ループになる。

for 文による無限ループ

```
1 for (;;) {  
2     <文>...;  
3 }
```

4 演習 4-13

1 から n までの総和を求めるプログラム。

4.1 コードリストティング

演習 4-13

```
1 #include <stdio.h>
2
3 int main(void) {
4     int n;
5     int sum = 0;
6
7 numInput:
8     printf("Input integer: ");
9     scanf("%d", &n);
10
11    if (n < 1) {
12        puts("Error: Please type in non-zero positive integer.");
13        goto numInput;
14    }
15
16    for (int i = 1; i <= n; i++) {
17        sum += i;
18    }
19
20    printf("ANS: %d", sum);
21
22    return 0;
23 }
```

4.2 実行結果

```
information-processing-1_14th-class/programs/p413 on 7 main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env)
> comp
main.c: 関数 'main' 内:
main.c:9:5: 警告: ignoring return value of 'scanf' declared with attribute 'warn_unused_result' [-Wunused-result]
  9 |   scanf("%d", &n);
     |   ^~~~~~
information-processing-1_14th-class/programs/p413 on 7 main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env)
> ./main
Input integer: 10
ANS: 55
information-processing-1_14th-class/programs/p413 on 7 main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env)
> ./main
Input integer: 100
ANS: 5050
information-processing-1_14th-class/programs/p413 on 7 main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env)
> ./main
Input integer: -12
Error: Please type in non-zero positive integer.
Input integer: 5
ANS: 15
information-processing-1_14th-class/programs/p413 on 7 main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env) took 2s
>
```

5 演習 4-14

1,2,3...8,9,0 を入力した整数値個表示するプログラム。

5.1 コードリストティング

演習 4-14

```
1 #include <stdio.h>
2
3 int main(void) {
4     int n;
5
6     numInput:
7         printf("Input positive integer: ");
8         scanf("%d", &n);
9
10    if (n < 0) {
11        puts("Please input positive integer.");
12        goto numInput;
13    }
14
15    for (int i = 1; i <= n; i++) {
16        printf("%d", i % 10);
17    }
18
19    putchar('\n');
20
21    return 0;
22}
```

22

}

5.2 実行結果

```
information-processing-1_14th-class/programs/p414 on ✎ main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env)
> comp
main.c: 函数 'main' 内:
main.c:8:5: 警告: ignoring return value of 'scanf' declared with attribute 'warn_unused_result' [-Wunused-result]
 8 |     scanf("%d", &n);
   |     ^
information-processing-1_14th-class/programs/p414 on ✎ main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env)
> ./main
Input positive integer: 10
1234567890

information-processing-1_14th-class/programs/p414 on ✎ main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env) took 3s
> ./main
Input positive integer: 15
123456789012345

information-processing-1_14th-class/programs/p414 on ✎ main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env) took 2s
> ./main
Input positive integer: 100
1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

information-processing-1_14th-class/programs/p414 on ✎ main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env) took 2s
> ./main
Input positive integer: -23
Please input positive integer.
Input positive integer: 0

information-processing-1_14th-class/programs/p414 on ✎ main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env) took 3s
> []
```

6 演習 4-18

入力した整数値の個数分アスタリスクを各行に5個ずつ表示するプログラム。

6.1 コードリストイング

演習 4-18

```
1 #include <stdio.h>
2
3 #define CHARSPERLINE 5
4
5 int main(void) {
6     int n;
7
8     numInput:
9     printf("Input integer: ");
10    scanf("%d", &n);
11
12    if (n < 1) {
13        puts("Please input non-zero positive integer.");
14        goto numInput;
15    }
16}
```

```

17     for (int i = 1; i <= n; i++) {
18         putchar('*');
19         if (i % CHARSPERLINE == 0) {
20             putchar('\n');
21         }
22     }
23
24     return 0;
25 }
```

6.2 実行結果

```

information-processing-1_14th-class/programs/p418 on 7 main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env)
> comp
main: 関数 'main' 内:
main.c:10:5: 警告: ignoring return value of 'scanf' declared with attribute 'warn_unused_result' [-Wunused-result]
 10 |     scanf("%d", &n);
     |     ^~~~~~
information-processing-1_14th-class/programs/p418 on 7 main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env)
> ./main
Input integer: 10
*****
*****
information-processing-1_14th-class/programs/p418 on 7 main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env) took 3s
> ./main
Input integer: 12
*****
*****
** information-processing-1_14th-class/programs/p418 on 7 main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env) took 3s
> ./main
Input integer: 3
***
information-processing-1_14th-class/programs/p418 on 7 main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env)
> ./main
Input integer: 0
Please input non-zero positive integer.
Input integer: -6
Please input non-zero positive integer.
Input integer: 4
*****
information-processing-1_14th-class/programs/p418 on 7 main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env) took 6s
> 
```

7 演習 4-19

入力した整数値の全約数とその個数を表示するプログラム。

7.1 コードリスト

演習 4-19

```

1 #include <stdio.h>
2
3 int main(void) {
4     int n;
5     int factors = 0;
6
7     numInput:
```

```

8     printf("Input integer: ");
9     scanf("%d", &n);
10
11    if (n < 1) {
12        puts("Please input positive integer.");
13        goto numInput;
14    }
15
16    for (int i = 1; i <= n; i++) {
17        if (n % i == 0) {
18            printf("%d\n", i);
19            factors++;
20        }
21    }
22
23    printf("Number of factors: %d\n", factors);
24
25    return 0;
26 }
```

7.2 実行結果

```

information-processing-1_14th-class/programs/p419 on 7 main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env)
> comp
main.c: 関数 'main' 内:
main.c:9:5: 警告: ignoring return value of 'scanf' declared with attribute 'warn_unused_result' [-Wunused-result]
  9 |     scanf("%d", &n);
  |     ^~~~~~
information-processing-1_14th-class/programs/p419 on 7 main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env)
> ./main
Input integer: 12
1
2
3
4
6
12
Number of factors: 6

information-processing-1_14th-class/programs/p419 on 7 main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env) took 3s
> ./main
Input integer: 3
1
3
Number of factors: 2

information-processing-1_14th-class/programs/p419 on 7 main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env) took 2s
> ./main
Input integer: 0
Please input positive integer.
Input integer: -21
Please input positive integer.
Input integer: 4
1
2
4
Number of factors: 3

information-processing-1_14th-class/programs/p419 on 7 main [X!?] via C v14.2.1-gcc via * impure (LaTeX-Environment-env) took 8s
> 
```

參考文献

[1]cppreference. *for loop*. URL: <https://en.cppreference.com/w/c/language/for.html> (visited on 07/17/2025).

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