아두이노를 위한 C/C++ 특강

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Outline

툴 설 치

Visual Studio Community Edition

- https://visualstudio.microsoft.com/ko/vs/community/?rr=https%3A%2F%2Fwww.google.co.kr%2F

Notepad++

- https://notepad-plus-plus.org/download/v7.6.html

youtube 동영상

- Visual Studio
  - https://www.youtube.com/watch?v=zuDmA8D1fK4&t=6s
- notepad++
  - https://www.youtube.com/watch?v=49058ekyTd0&t=4s

실습방법

- GUI
- VS 2017에 대한 개발자 명령 프롬프트 + NotePad++
  - cl helloWorld.c && helloWorld.exe

Hello World

```
1  #include <stdio.h>
2  int main(){
3    printf("Hello World");
4    return 0;
5  }
```

입출력함수

- 출력합수
  - puts
  - fputs
  - putchar
  - printf
- 입력함수
  - getchar
  - gets
  - scanf

printf

```
int printf( const char * format, ...);
```

- 표준출력(모니터)으로 format이 지정하는 문자열을 출력한다.
- http://www.cplusplus.com/reference/cstdio/printf/

printf 예제

```
1  #include <stdio.h>
2  int main(){
3     printf ("Characters: %c %c \n", 'a', 65);
4     printf ("Decimals: %d %ld\n", 1977, 650000L);
5     printf ("Preceding with blanks: %10d \n", 1977);
6     printf ("Width trick: %*d \n", 5, 10);
7     printf ("%s \n", "A string");
8     return 0;
9  }
```

실행결과

```
Characters:   a               A
Decimals:     1977       650000
Preceding     with    blanks:   1977
Width         trick:         10
A             string
```

scanf

```
int scanf(const char * format, ...);
```

- 표준입력(키보드)으로부터 데이터를 입력받아 format에 따라 추가적인 파라미터가 가리키는 변수에 저장한다.
- http://www.cplusplus.com/reference/cstdio/scanf/

scanf 예제

```
 1  #include <stdio.h>
 2  int main (){
 3    char str [80];
 4    int i;
 5
 6    printf ("Enter your family name: ");
 7    scanf ("%79s",str);
 8    printf ("Enter your age: ");
 9    scanf ("%d",&i);
10    printf ("Mr. %s , %d years old.\n",str,i);
11    printf ("Enter a hexadecimal number: ");
12    scanf ("%x",&i);
13    printf ("You have entered %#x (%d).\n",i,i);
14
15    return 0;
16  }
```

실행결과

```
Enter your family name: Soulie
Enter your age: 29
Mr. Soulie , 29 years old.
Enter a hexadecimal number: ff
You have entered 0xff (255).
```

연산자

- 사칙연산자
  - +, -, *, /
- 삼항연산자
  - bigNumber = (2 > 3) ? 2 : 3;
- 나머지 연산자(%)
  - r = 7 % 2
- 단항연산자
  - ++, −

삼항연산자 예제

source code

```
 1  #include <stdio.h>
 2  int main(int argc, char *argv[])
 3  {
 4    int num1=3, num2=4;
 5    int bigNumber;
 6  //  fputs("Enter two numbers : ", stdout);
 7  //  scanf("%d %d", &num1, &num2);
 8    bigNumber = (num1 > num2) ? num1 : num2;
 9    printf("The big number is  %d \n", bigNumber);
10    return 0;
11  }
```

실행결과

```
The big number is  4
```

응용예제

source code

```
1  #include <stdio.h>
2  int main(){
3    int temp = 0;
4    int N = 10;
5    for (int i=0; i<N; i++)
6      if(i%2)
7        temp += i;
8    printf("Sum of odd numbers from 0 to %d is %d\n", N, temp);
9  }
```

실행결과

```
Sum of odd numbers from 0 to 10 is 25
```

if (조건) {실행문} else {실행문}

```
 1  #include <stdio.h>
 2  typedef enum _Fruits {BANANA, APPLE} Fruits;
 3  Fruits theFruit;
 4  int main () {
 5    printf("Which fruit do you like?\n");
 6    printf("0. Banana 1. Apple ");
 7    scanf("%d", &theFruit);
 8    printf("Your answer is %d\n",theFruit);
 9    if(theFruit == BANANA)
10      printf("It's banana\n");
11    else if(theFruit == APPLE)
12      printf("It's apple\n");
13    else
14      printf("O Oh!! Your got the wrong fruit.....\n");
15    break;
16  }
```

switch-case

```
 1  #include <stdio.h>
 2   typedef enum _Fruits {BANANA, APPLE} Fruits;
 3   Fruits theFruit;
 4   int main () {
 5     printf("Which fruit do you like?\n");
 6     printf("0. Banana 1. Apple ");
 7     scanf("%d", &theFruit);
 8     printf("Your answer is %d\n",theFruit);
 9     switch (theFruit) {
10       case BANANA:
11   printf("It's banana\n");
12   break;
13       case APPLE:
14   printf("It's apple\n");
15   break;
16       default:
17   printf("O Oh!! Your got the wrong fruit.....\n");
18   break;
19     }
```

for loop

- this slide consists of two columns
- the first (left) column has no heading and consists of text
- the second (right) column has an image and is enclosed in an @example@ block

Example (A screenshot)

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Babel

Octave code

```
A = [1 2 ; 3 4]
b = [1; 1];
x = A\b
```

The output

```
A =

   1   2
   3   4

x =

  -1
   1
```