



# **| Basis and Practice in Programming** week4



# Character Representation(1/2)

- Character representation in C
  - Just integer number
  - ASCII : American Standard Code for Information Interchange

```
/* practice 1 : character representation */
#include <stdio.h>

int main(void)
{
    char sa = 'a', sb = 'b';
    char la = 'A', lb = 'B';

    printf("%c %c %c %c\n", sa, sb, la, lb);
    printf("%d %d %d %d\n", sa, sb, la, lb);

    return 0;
}
```

## Printing format

%c : character format

%d : integer format

# Character Representation(2/2)

- Character representation in C (continued)

```
/* practice 2 : integer to character*/
#include <stdio.h>

int main(void)
{
    char foo = 48, bar = 97;
    int i = 0;

    while (i < 10) {
        foo += 1;
        bar += 1;
        printf("%c %c\n", foo, bar);
        i++;
    }

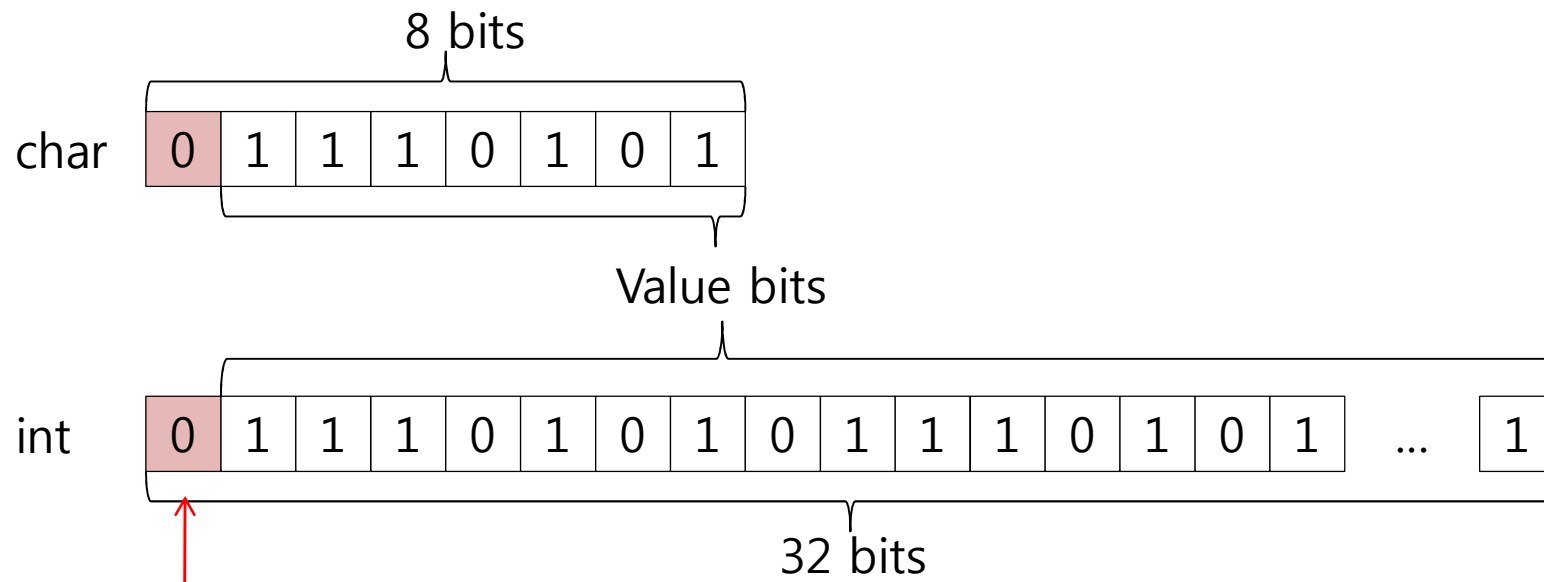
    return 0;
}
```

**ASCII Table :**

<http://www.asciitable.com/>

# Integer Representation(1/3)

- Integer representation in C
  - Char type : 8 bits (1 byte)
  - Int type : 32 bits (4 bytes)
  - Sign bit : representing +/-, Value bits : value of number



MSB : sign bit

# Integer Representation(2/3)

- Integer representation in C (continued)

Data type	Memory size	Range
char (signed)	1 byte	-128 ~ 127
char (unsigned)	1 byte	0 ~ 255
int (short)	2 bytes	-32768 ~ 32767
int (signed)	4 bytes	-2147483648 ~ 2147483647
int (unsigned)	4 bytes	0 ~ 4294967295

# Integer Representation(3/3)

- Integer representation in C (continued)

```
/* practice 3 : integer representation*/
#include <stdio.h>

int main(void)
{
    int num = 0xffffffff; //maximum value in int

    printf("%d %u\n", num, num);

    return 0;
}
```

## Printing format

%u : unsigned integer format

# Printing Format (1/2)

- C supports formatted printing

Format	Description
%c	Single character
%d (= %i) / %u	Signed integer / Unsigned integer
%f	Signed floating point number
%s	String
%o	Unsigned octal number
%x / %X	Unsigned hexadecimal (small/capital letter)
%e	e-notation of real number
%%	printing '%'

# Printing Format (2/2)

```
/* practice 4 : printf exercise*/
#include <stdio.h>

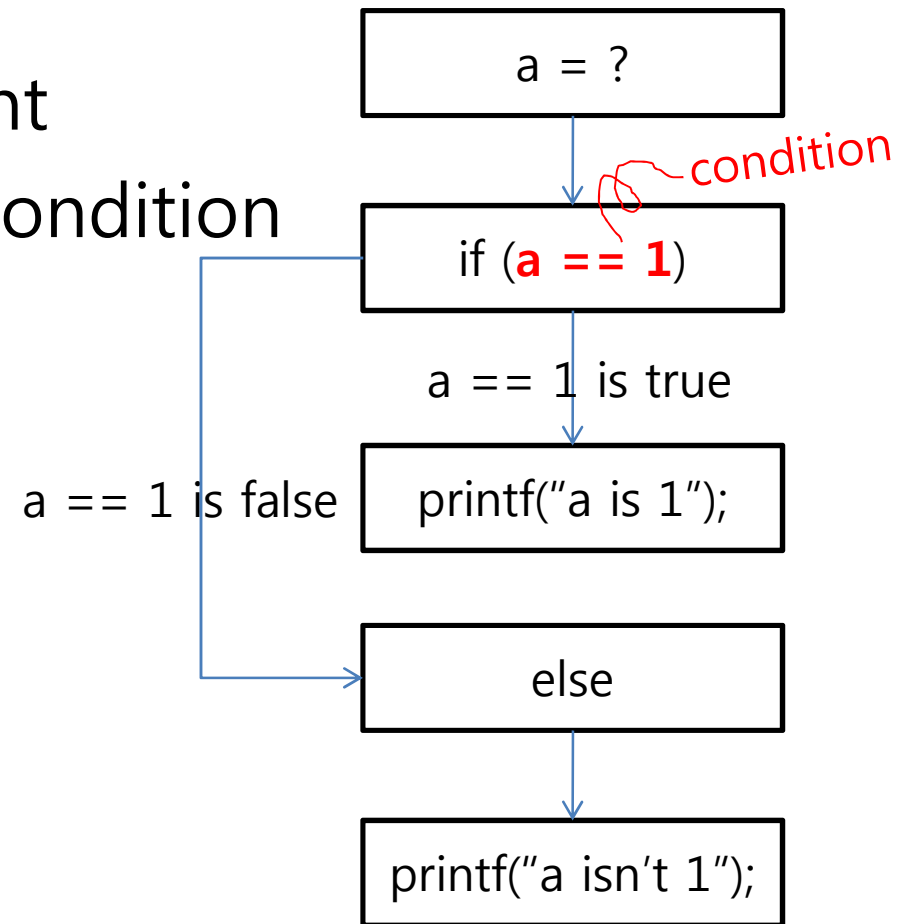
int main(void)
{
    printf("Menu...\n");
    printf("%10s: $%u\n", "Spaghetti", 10);
    printf("%10s: $%2.6f\n", "Pizza", 15.50);
    printf("%10s: $%2.6f\n", "Salad", 6.50);
    printf("%10s: $%2.6f\n", "Coke", 1.50);

    return 0;
}
```



# If Statement (1/2)

- If-else statement
  - Control flow statement
  - Controlled by given condition



# If Statement (2/2)

- If statement (continued)

```
/* practice 5 : if statement exercise*/
#include <stdio.h>

int main(void)
{
    int a;
    scanf("%d", &a);

    if (a > 10) {
        printf("a is bigger than 10\n"); // condition is true
    } else {
        printf("a is smaller than 10\n"); // condition is false
    }

    return 0;
}
```

# Exercise

- Letter changer (Due date : Today's 11:59 PM)
  - Enter one character (only Alphabet can be input)
  - Translate small letter to capital letter
  - Translate capital letter to small letter
  - Print translated letter as output
  - Must use if-statement

