DASF004: Basic and Practice in Programming

- Lab 2: Program Sequencing and Control

Reminder ...

- Last week:
  - » Variable
  - - Variable Declaration and Assignment
  - - Variable Type
    - - Type casting
  - » Arithmetic Operations
  - » `printf()` and `scanf()` functions from `<stdio.h>`

In this lab ...

- More complex program sequencing and control
- What you need to submit in this lab (Lab #2):
  - Lab Exercise #2 on iCampus before 11:59 pm
  - Assignment #2 by Tuesday 11:59 pm

`if` statement

- If the condition is met (i.e., the condition is true), the statement in the body of the `if` statement is executed
- If the condition is not met (i.e., the condition is false), the body statement is not executed.
- Whether the body statement is executed or not, after the `if` statement completes, execution proceeds with the next statement after the `if` statement.

```
if(x == 1)
{ printf("The value of x is 1.\n");
}
```

Algebraic equality or relational operator	C equality or relational operator	Example of C condition	Meaning of C condition
Equality operators			
=	==	x == y	x is equal to y
≠	!=	x != y	x is not equal to y
Relational operators			
>	>	x > y	x is greater than y
<	<	x < y	x is less than y
≥	>=	x >= y	x is greater than or equal to y
≤	<=	x <= y	x is less than or equal to y

Fig. 2.12 | Equality and relational operators.

`if … else` statement

- Just like `if` statement, but with multiple conditions.

```
if(x == 1)
{ printf("The value of x is 1.\n");
}
else if(x == 2)
{ printf("The value of x is 2.\n");
}
else if(x == 3)
{ printf("The value of x is 3.\n");
}
else
{ printf("The value of x is not 1, nor 2, nor 3.\n");
}
```

`switch` statement

- Similar to `if-then-else` statement, for multiple selection
- Test the switch label in the `switch` statement
- Execute the case body when the case is matched

```
switch (x)
{    case 1:
     printf("1!!!");
     break;
case 2:
     printf("2!!!");
     break;

default:
     printf("D!!!");
}
```

`if … else if … else` statement

- Similar to `if-else if-else` statement, for multiple selection
- Test the switch label in the `switch` statement
- Execute the case body when the case is matched

```
if (x == 1)
{   printf("1!!!");
}
else if (x == 2)
{   printf("2!!!");
}
else
{   printf("D!!!");
}
```

`switch` statement

- Similar to `if-then-else` statement, for multiple selection
- Test the switch label in the `switch` statement
- Execute the case body when the case is matched

```
switch (x)
{ case 1:
    printf("1!!!");
    break;
  case 2:
    printf("2!!!");
    break;

  default:
    printf("D!!!");
}
```

Try this yourself ...

- The parking lot has the following charge:
- 1-2 hours: 10,000 won per hours
- 3-6 hours: 9,000 won per hours
- 7-12 hours: 8,000 won per hours
- 13 hours or more: 7,000 won per hours

- Write a program to perform the following task:
  - Ask the user to enter the number of hour
  - Calculate and display the charge according to user's input

Sample Output

Enter the number of hour(s): 3
The charge is 27000 won.
<End of program>

Enter the number of hour(s): 7
The charge is 56000 won.
<End of program>

Lab Exercise 2

Write a program to calculate the area of three different shapes.
You program should:

1)Ask the user to choose if he wants to calculate the area of (1) a circle, (2) a rectangle or (3) a triangle.
2)If the user chooses (1) circle, ask the user to input the radius of the circle.
3)If the user chooses (2) rectangle (3) triangle, ask the user to input the width and height.
4)Calculate and display the area.

Deadline: Before the end of today: 23:59 pm

Sample Output for Lab Exercise 2

```
(1) Triangle
(2) Rectangle
(3) Triangle
Enter the shape: 1
Enter the radius of the circle: 7
The area of the circle is 154.
<End of program>
```

```
(1) Triangle
(2) Rectangle
(3) Triangle
Enter the shape: 2
Enter the width of the rectangle: 5
Enter the height of the rectangle: 4
The area of the rectangle is 20.
<End of program>
```

```
(1) Triangle
(2) Rectangle
(3) Triangle
Enter the shape: 3
Enter the width of the triangle: 3
Enter the height of the triangle: 5
The area of the Triangle is 7.5.
<End of program>
```

Reminder from last week ……
Taking input from user

- Use the `scanf()` function from `stdio.h` library

```
int x;                                  // Declare variable x
printf("Input the value of x: ");       // Prompt user for input
scanf("%d", &x);                        // Assign user input to x
printf("The value of x is: %d\n", x);   // Print out value of x
```

- Note. User input (from `scanf()`) will be stored as an integer variable.

Assignment #2: Sequence Control

Enter date in numerical value; display in English form

1) Prompt the user to input a date in 8-digit numerical form (MMDDYYYY)
   - » For example, **05221980**.
2) Display the date in English form
   - » For example, **22nd May 1980**.
3) If the day the user entered is 01, 21 or 31, add “st” after the day.
4) Else if the day the user entered is 02 or 22, add “nd” after the day.
5) Else if the day the user entered is 03 or 23, add “rd” after the day.
6) Else, add “th” after the day.

Sample Output for Assignment 2

Enter a date in numerical form (MMDDYYYY): **05051980**
The date you entered is: 5th May 1980
<End of program>

Enter a date in numerical form (MMDDYYYY): **12122012**
The date you entered is: 12th December 2012
<End of program>

Enter a date in numerical form (MMDDYYYY): **10022000**
The date you entered is: 2nd October 2000
<End of program>

Enter a date in numerical form (MMDDYYYY): **01312006**
The date you entered is: 31st January 2006
<End of program>

Enter a date in numerical form (MMDDYYYY): **07031950**
The date you entered is: 3rd July 1950
<End of program>

Assignment #2: Sequence Control

Deadline: Tuesday 16 March 23:59 pm
Submit to iCampus
Submit your **source code** only