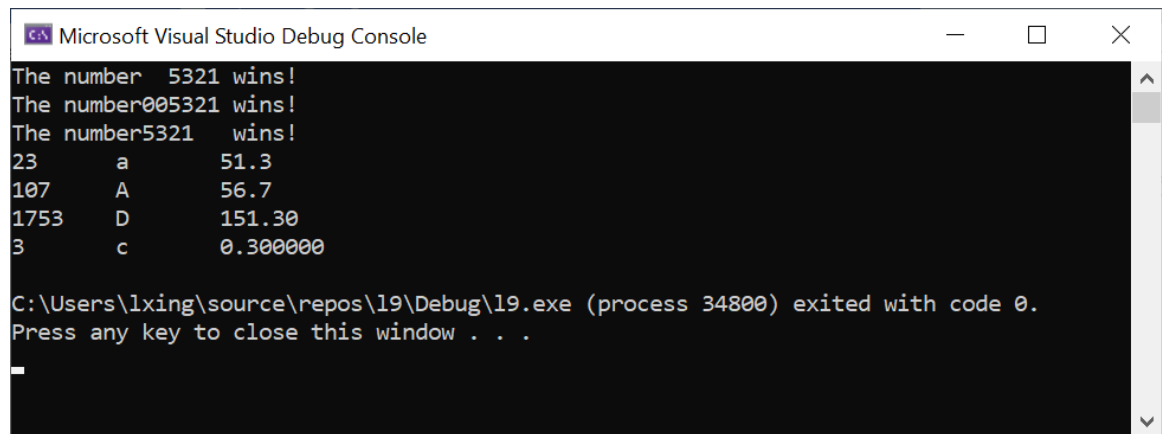


**LAB # 3 Solution**  
**(Relevant Lecture: #6, #7)**

1. Write down what each printf() statement can output. Then enter, compile and run the following C program to confirm your answer:

```
/* Learn the use of field specifications in the printf() */
#include <stdio.h>
void main(void)
{
    printf("The number%6d wins!\n", 5321);
    printf("The number%06d wins!\n", 5321);
    printf("The number%-6d wins!\n", 5321);
    printf("%d\t%c\t%4.1f\n", 23, 'a', 51.3);
    printf("%d\t%c\t%3.1f\n", 107, 'A', 56.7);
    printf("%d\t%c\t%5.2f\n", 1753, 'D', 151.3);
    printf("%d\t%c\t%f\n", 3, 'c', 0.3);
}
```

**Solution:**



The screenshot shows a window titled "Microsoft Visual Studio Debug Console". The output of the program is as follows:

```
The number  5321 wins!
The number005321 wins!
The number5321  wins!
23      a      51.3
107     A      56.7
1753    D      151.30
3       c      0.300000

C:\Users\lxing\source\repos\l9\Debug\l9.exe (process 34800) exited with code 0.
Press any key to close this window . . .
```

2. Enter, compile and run the following C program. After you run this program, based on the output from each printf() statement, learn the function of each special character.

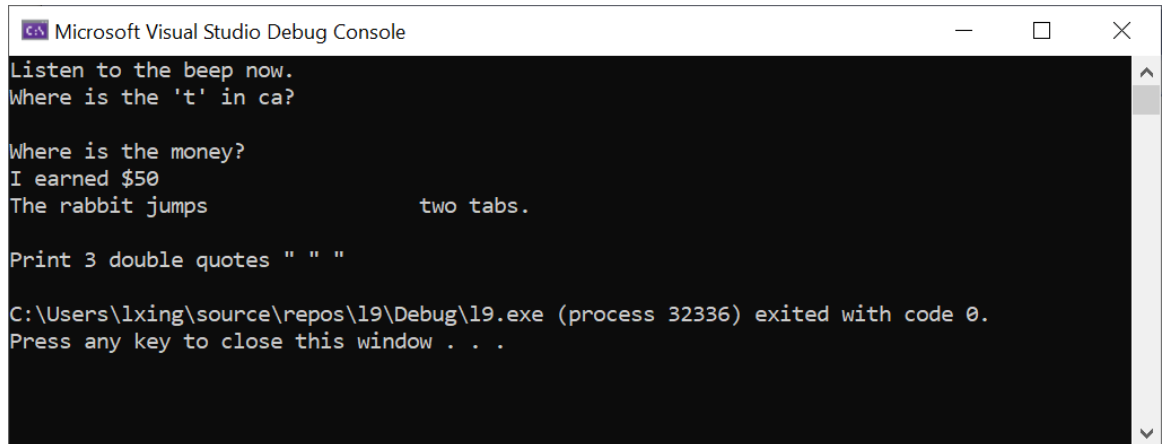
```
/* Learn the use of special characters in the printf() */
#include <stdio.h>
void main(void)
{
    printf("Listen to the beep now. \a");
    printf("\nWhere is the 't' in cat\b?\n\n");

    printf("I earned $50 \rWhere is the money?\n");
    printf("I earned $50 \0Where is the money?\n");

    printf("\nThe rabbit jumps \t\t two tabs.\n\n");

    printf("Print 3 double quotes \" \" \" \n");
}
```

**Solution:**



```
Microsoft Visual Studio Debug Console

Listen to the beep now.
Where is the 't' in ca?

Where is the money?
I earned $50
The rabbit jumps          two tabs.

Print 3 double quotes " " "

C:\Users\lxing\source\repos\19\Debug\19.exe (process 32336) exited with code 0.
Press any key to close this window . . .
```

**Explanation:**

Special Character	Meaning	Result
\a	Alert/bell	Generate a beep or an audible alert
\b	Backspace	Move the cursor back one space on the current line
\n	New line	Linefeed to the initial position of the next line
\r	Return	Move the cursor to the initial position of the current line
\0	Null character	Terminate a string or kill the rest of the line
\t	Horizontal tab	Insert a tab space
\"	Double quote	Display a double quote

3. Write a program that prints a box as follows:

```
*****
*      *
*      *
*      *
*      *
*      *
*****
```

**Solution:**

```
#include <stdio.h>
void main(void)
{
    printf("\n\n");
    printf("*****\n");
    printf("*      *\n");
    printf("*      *\n");
    printf("*      *\n");
    printf("*      *\n");
    printf("*      *\n");
    printf("*****\n");
}
```

```
Microsoft Visual Studio Debug Console

*****
*      *
*      *
*      *
*      *
*      *
*****

C:\Users\lxing\source\repos\l9\Debug\l9.exe (process 126736) exited with code 0.
Press any key to close this window . . .
```

4. Write a program that reads the following values using `scanf_s()` and then prints them out using `printf()`.

100 100.2 1

**Solution:**

```
#include <stdio.h>
void main(void)
{
    int a = 0;
    float b = 0;
    int c = 0;
    /*This line is optional*/
    printf("Please input 3 numbers: integer, floating point, integer: \n");
    scanf_s("%d %f %d", &a, &b, &c);
    printf("%d %5.1f %d", a, b, c);
}
```

```
Microsoft Visual Studio Debug Console

Please input 3 numbers: integer, floating point, integer:
100 100.2 1
100 100.2 1

C:\Users\lxing\source\repos\l9\Debug\l9.exe (process 122892) exited with code 0.
Press any key to close this window . . .
```

5. Write a program that reads the following values using `scanf_s()` and then prints them out using `printf()`.

02/07/2022

**Solution:**

```

#include <stdio.h>
void main(void)
{
    int a = 0;
    int b = 0;
    int c = 0;
    /*This line is optional*/
    printf("Please input 02/07/2022:\n");
    scanf_s("%2d/%2d/%4d", &a, &b, &c);
    printf("%02d/%02d/%04d", a, b, c);
}

```

```

Microsoft Visual Studio Debug Console
Please input 02/07/2022:
02/07/2022
02/07/2022
C:\Users\lxing\source\repos\l9\Debug\l9.exe (process 114588) exited with code 0.
Press any key to close this window . . .

```

6. Write a program where you ask the user to enter 3 integer numbers and you print them out one per line in the order the numbers were entered.

*For example: The user entered 3 7 9 Output:*

```

3
7
9

```

**Solution:**

```

#include <stdio.h>
void main(void)
{
    int a, b, c;
    a = 0;
    b = 0;
    c = 0;
    printf("Please input 3 integer numbers: \n");
    scanf_s("%d %d %d", &a, &b, &c);
    printf("\n%d\n%d\n%d\n", a, b, c);
}

```

```

Microsoft Visual Studio Debug Console
Please input 3 integer numbers:
3 7 9

3
7
9

C:\Users\lxing\source\repos\l9\Debug\l9.exe (process 102396) exited with code 0.
Press any key to close this window . . .

```