

WEEK-END ASSIGNMENT-00

Operating Systems Workshop (CSE 3541)

Problem Statement:

Working with general form of C program, formatted output function-**printf()** and formatted input function-**scanf()**

Assignment Objectives:

Familiarization with the general form of a C program, various ways to use printf() to output data items/ messages on standard output device and scanf() function to input of data items from standard input device.

Instruction to Students (If any):

This assignment is designed to deal with general structure of C program, use of printf() function and scanf() function. In this assignment, students are required to write their programs to solve each and every problem as per the specification to meet the basic requirement of systems programming. **Students are required to write the output/ paste the output screen shots onto their laboratory record after each question.**

Programming/ Output Based Questions:

1. Write a C program to display the following messages.

```
This is my First C Program!
I konw:
    where to write C program,
    how to save and edit the program!
To compile- (1) gcc filename.c
            (2) gcc filename.c -o myout
To run-    (1) ./a.out
            (2) ./myout
-----
Able to run successfully !!!
```

Write your program here

Write/paste output

2. Write the output of the code snippet that makes the use of the **printf** function.

```
int main() {  
    float i=2.0,j=3.0;  
    printf("%f %f %f", i,j,i+j);  
    return 0;  
}
```

Write/paste output in exact form as expected

3. Express the output of the code snippet;

```
int main() {  
    printf("%d==%f==%lf\n", 5, 55.5, 55.5);  
    printf("%i==%e==%E\n", 5, 555.5, 123.45);  
    printf("%o==%g==%G\n", 9, 555.5, 123.45);  
    return 0;  
}
```

Write/paste output in exact form as expected

4. State the output of the code snippet;

```
int main() {  
    printf ("%d==i==o==x\n", 32, 32, 32, 32) ;  
    printf ("%d==i==#o==#x\n", 32, 32, 32, 32) ;  
    printf ("%d==i==#o==#X\n", 32, 32, 32, 32) ;  
    printf ("%+d==+i==#o==#X\n", 32, 32, 032, 0x45b) ;  
    return 0;  
}
```

Write/paste output in exact form as expected

5. The given code snippet generate the same floating-point output in three different from. Mention the two different form int the space provided below the code snippet.

```
int main() {  
    double x=3000.0, y=0.0035;  
    printf ("%f %f %f\n", x, y, x*y, x/y) ;  
    printf ("%e %e %e\n", x, y, x*y, x/y) ;  
    printf ("%E %E %E\n", x, y, x*y, x/y) ;  
    return 0;  
}
```

Write/paste output in exact form as expected

6. Assuming the **side**, and **area** are type **float** variables containing the length of one side in cm and area of a square in square cm, write a statement using **printf** that will display this information in this form:

The area of a square whose side length is _____ cm
is _____ square cm.

Write/paste output in exact form as expected

7. Show the exact form of the output line when **n** is 345.(consider = 1 blank.

```
printf("Three values of n are %4d*%5d*%d\n",n,n,n);
```

Write/paste output in exact form as expected

8. State the data types would you use to represent the following items: number of students in your section, a letter grade on the AD1 exam, average number of days in a semester, the name of the topper of your class, total number of courses in this semester. Also specify the format specifier/placeholder for the variables used in the above case.

Specify answer in two column: data type and the required format specifier

9. The following C code snippet illustrate the use of minimum field width feature in **printf** function. Write the output of the code snippet assuming _ as 1 blank space.

```
int main()
{
    int i=54321;
    float x=876.543;
    printf(":%3d: :%5d: :%10d: :%12d:\n",i,i,i,i);
    printf(":%3f: :%10f: :%13f: :%f:\n",x,x,x,x);
    return 0;
}
```

State the output in exact form

10. The following C code snippet illustrate the use of minimum field width feature in **printf** function. Write the output of the code snippet assuming _ as 1 blank space.

```
int main()
{
    int i=54321;
    float x=876.543;
    printf(":%-3d: :%-5d: :%-10d: :%12d:\n",i,i,i,i);
    printf(":%-3f: :%-10f: :%-13f: :%f:\n",x,x,x,x);
    return 0;
}
```

State the output in exact form

11. The following C code snippet illustrate the use * as minimum field width feature in **printf** function. Write the output of the code snippet assuming _ as 1 blank space.

```
int main()
{
```

```
int ivar=1234;
printf(":%*d:\n",10,ivar);
printf(":%-*d:\n",10,ivar);
return 0;
}
```

State the output in exact form

12. The following C code snippet illustrate the use * as minimum field width feature in **printf** function. Write the output of the code snippet assuming _ as 1 blank space.

```
int main()
{
    int ivar=1234;
    printf(":%*.*d:\n",10,4,ivar);
    printf(":%-*.*d:\n",10,4,ivar);
    return 0;
}
```

State the output in exact form

13. The following C code snippet illustrate the use * as minimum field width feature in **printf** function. Write the output of the code snippet assuming _ as 1 blank space.

```
int main()
{
    int ivar=1234;
    printf(":%*.*d:\n",13,7,ivar);
    printf(":%-*.*d:\n",13,7,ivar);
    return 0;
}
```

State the output in exact form

14. The following C code snippet illustrate the use * as minimum field width feature in **printf** function. Write the output of the code snippet assuming _ as 1 blank space.

```
int main()
{
    int ivar=1234;
    printf(":%.*d:\n",7,ivar);
    printf(":%-.*d:\n",7,ivar);
    return 0;
}
```

State the output in exact form

15. The following code snippet shows a case without minimum field width specification, but with precision specification. Write the desired output.

```
int main()
{
    float x=123.456;
    printf("%f %.3f %.1f %.0f\n",x,x,x,x);
    printf("%e %.5e %.3e %.0e\n",x,x,x,x);
    return 0;
}
```

State the output in exact form

16. The minimum field width and precision in the format string of printf function can be applied to character data as well as numerical data. When applied to a string, the minimum field width is interpreted in the same manner as with the numerical quantity. However, the precision specification will determine the **maximum** number of characters that can be displayed. If the precision specification is less than the total number of characters in the string, the excess right-most characters will not be displayed. This will occur even if the minimum field width is larger than the entire string, resulting in the addition of leading blanks to the truncated string. So, write the output of the following code snippet;

```
int main()
{
    char line[]="hexadecimal";
    printf(":%10s: :%15s: :%15.5s: :%.5s:\n",line,line,line,line);
}
```

```
    return 0;
}
```

State the output in exact form

17. Determine the output of the code snippet that uses the uppercase conversion characters in the printf function.

```
int main()
{
    int a=0x80ec;
    float b=0.3e-12;
    printf(":%#4x: :%#10.2e:\n",a,b);
    printf(":%#4X: :%#10.2E:\n",a,b);
    return 0;
}
```

State the output in exact form

18. The following program shows the placement of **flags**(i.e -, +, 0, space, #) in printf format string just after the symbol % to get some specific affects in the appearance of the printf output.

```
int main(){
    int i=345;
    float x=34.0, y=-5.6;
    printf(":%6d: :%7.0f: :%10.1e:\n",i,x,y);
    printf(":%-6d: :%-7.0f: :%-10.1e:\n",i,x,y);
    printf(":%+6d: :%+7.0f: :%+10.1e:\n",i,x,y);
    printf(":%-+6d: :%-+7.0f: :%-+10.1e:\n",i,x,y);
    printf(":%6.0d: :%#7.0f: :10g: :%#10g:\n",x,x,y,y);
    return 0;}

```


State the output in exact form

19. Predict the output of the given code snippet that uses the flags with unsigned decimal, octal and hexadecimal numbers.

```
int main(){
    int i=345, j=01767, k=0xa0bd;
    printf(":%8u: :%8o: :%8x:\n", i, j, k);
    printf(":%-8u: :%-8o: :%-8x:\n", i, j, k);
    printf(":%#8u: :%#8o: :%#8x:\n", i, j, k);
    printf(":%08u: :%0o0: :%08x:\n", i, j, k);
    printf(":% #8u: :% #8o: :% #8x:\n", i, j, k);
    return 0;
}
```

State the output in exact form

20. Predict the output of the given code snippet that outline the use of flags with string.

```
int main()
```

```

{
    char line[]="lower-case";
    printf(":%15s: :%15.5s: :%.5s:\n",line,line,line);
    printf(":%-15s: :%-15.5s: :%-.5s:\n",line,line,line);
    return 0;
}

```

State the output in exact form

21. Predict the output of the given code snippet that illustrates how printed output can be labeled.

```

int main()
{
    float a=2.2, b=-6.2, x1=.005, x2=-12.88;
    printf("$%4.2f %7.1f%%\n",a,b);
    printf("x1=%7.3f x2=%7.3f\n",x1,x2);
    return 0;
}

```

State the output in exact form

22. Write a program to read three characters from the standard input device (i.e. keyboard) and display the characters on the standard output device (i.e. monitor) using %c format specifier/place holder. The different ways to provide input to the program are; (i) S O A (ii) S ;enter; O ;enter; A ;enter; (iii) ;multiple spaces; S ;multiple spaces; O ;multiple spaces; A ;enter;. Redesign your program to use %s in scanf for the same objective instead of %c in scanf.

Write your code here

23. Choose the output of the code snippet;

```
int main()
{
    int i=10,m=10;
    printf("%d",i*m,m);
    return 0;
}
```

State the output in exact form

(A) 100 10

(C) 10

(B) 100

(D) Error

Answer with reason:

24. Predict the output of the given code snippet that illustrates a form of formatted input function scanf.

```
int main()
```

```
{
    int sr=100,pr=100;
    sr=scanf("Me a scanner");
    pr=printf("scanf returns=%d\n",sr);
    printf("printf returns::%d\n",pr);
    return 0;
}
```

State the output in exact form

- | | | |
|-------------|----------|-----------------------|
| (A) 100 100 | (C) 0 16 | (E) Compilation error |
| (B) 0 100 | (D) 16 0 | (F) Run-time error |

Answer with reason:

25. Predict the output of the given code snippet;

```
int main()
{
    int num;
    printf("Enter a number:");
    scanf("%2d",&num);
    printf("number=%d",num);
    return 0;
}
```

State the output in exact form

Choose the output if inputs are (i) 2345 (ii) 9 (iii) 76 (iv) 456 on different run.

- | | |
|-------------------|-------------------|
| (A) 2345 9 76 456 | (C) 456 76 9 2345 |
| (B) 23 9 76 45 | (D) No output |

Answer with reason:

26. Predict the output of the given code snippet;

```
int main()
{
    int num1=0,num2=0,num3=0;
    printf("Enter a number:");
}
```

```
scanf ("%2d%3d%4d", &num1, &num2, &num3);  
printf ("%d %d %d", num1, num2, num3);  
return 0;  
}
```

State the output in exact form

Choose the output, if inputs are (i) 2345 (ii) 9 (iii) 76 (iv) 456 on different runs.

- | | |
|-------------------|-------------------|
| (A) 2345 9 76 456 | (C) 456 76 9 2345 |
| (B) 23 9 76 45 | (D) No output |

Answer with reason:

27. Choose the output of the code snippet;

```
int main()  
{  
    int num1=0,num2=0,num3=0;  
    printf("Enter the number as <345678>:");  
    scanf ("%1d%2d%3d", &num1, &num2, &num3);  
    num1=num1+num2+num3;  
    printf ("%d\n", num1);  
    return 0;  
}
```

State the output in exact form

- | | |
|------------|---------------|
| (A) 87654 | (C) 726 |
| (B) 345678 | (D) No output |

Answer with reason:

28. Choose the output of the code snippet;

```
int main()  
{  
    int i=10,m=10;  
    printf ("%d",printf ("%d %d ",i,m));  
    return 0;  
}
```

State the output in exact form

(A) 10 10 6

(C) 6 6 6

(B) 10 10 10

(D) No output

Answer with reason:

29. A C program contains the following form; Suppose that the following string has been assigned to text
Programming with C cab be a challenging creative activity. Show the output resulting from the following printf statements

```
int main()
{
    chat text[100];
    :::::::::::
    printf("%s\n",text);
    printf("%18s\n",text);
    printf("%.18s\n",text);
    printf("%18.7s\n",text);
    printf("%-18.7s\n",text);
    return 0;
}
```

State the output in exact form

30. A C program contains the following statements. Write an appropriate **scanf** function to enter numerical values of **i**, **j** and **k** assuming
- (i) The values for **i**, **j** and **k** will be decimal numbers. Display the values.
 - (ii) The value of **i** will be decimal integer, **j** an octal integer and **k** a hexadecimal integer. Display the values.
 - (iii) The value of **i** and **j** will be hexadecimal number and **k** an octal integer. Display the values.

State the output in exact form

Code for (i)

State the output in exact form

Code for (ii)

State the output in exact form

Code for (ii)

31. Describe the output of the code snippet;

```
int main() {
    int a, b, c;
    printf("Enter in decimal format:");
    scanf("%d", &a);
    printf("Enter in octal format: ");
    scanf("%d", &b);
    printf("Enter in hexadecimal format: ");
    scanf("%d", &c);
    printf("a = %d, b = %d, c = %d", a, b, c);
    printf("Enter in decimal format:");
    scanf("%i", &b);
    printf("Enter in octal format: ");
    scanf("%i", &b);
    printf("Enter in hexadecimal format: ");
    scanf("%i", &c);
    printf("a = %i, b = %i, c = %i\n", a, b, c);
    return 0;}
```

Run the code & Conclude the difference of %d and %i