Programming Lab Report

Vivid Padungkiatsakul 6601023620026[1]

[1]Robotic Engineering and Automation System, Faculty of Engineering, King Mongkut's University of Technology North Bangkok

[010243107] C Programming 2023

Lab Week 1

Flowchart, printf and scanf

Topic

- Introduction
- Problem analysis
- Flowchart
- Compilation and running a program
- printf/scanf

Experiment I

1 Problem description

- Write a program to show message

- "Hello xxxxxxxxx on screen, where xxxxxxxxx is your name.

2 Program design

- use printf; function to output text in terminal.

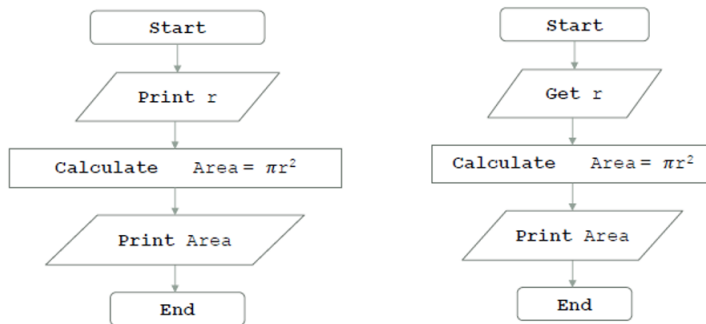## 3 Program text

```c
#include <stdio.h>

int main() {
  printf("Hello Vivid");
  return 0;
}
```

Experiment II

1 Problem description

- According to flowcharts below, write program for each of them.

2 Problem Flowchart

```
      Start                          Start
        |                              |
     Print r                        Get r
        |                              |
  Calculate  Area = πr²        Calculate  Area = πr²
        |                              |
    Print Area                    Print Area
        |                              |
       End                           End
```

3 Program design

- First, include math.h for use Pi.

- For Left flowchart r variable is fix. so we can set r in any number.

- For Right flowchart r variable is from user input. so, we use scanf; to get user input from terminal.

4 Program Text

```c
#include <stdio.h>
#include <math.h>
#define M_PI 3.14159265358979323846

int main(){
    float r = 20;
    float area;
    area = M_PI*r*r;
    printf("%.6f\n",r);
    printf("%.6f",area);
    return 0;
}
```

```c
#include <stdio.h>
#include <math.h>
#define M_PI 3.14159265358979323846

float r,area;

int main(){
    printf("INSERT R: ");
    scanf("%f",&r);
    area = M_PI * r * r;
    printf("%f\n",r);
    printf("%f",area);
}
```

Ex2-1.c   **Ex2-2.c**

Experiment III

1 Problem description

- Answer following questions..

Q 3.1: Run lab1-1.c and observe result. What is the effect of \n and \t?

Q 3.2: Try adding \n after double quote in lab1-1.c as shown below.

```
printf("He lives in Bangkok \n);
```

Save, compile, run and observe the result. What is error message? How to correct it?

2 Problem program text

```
#include <stdio.h>
int main (void)
{
    printf("Somchai\n is very handsome.");
    printf("He is 20 years \nold.");
    printf("He lives\tin Bangkok .");
}
```

3 Program design

- \n use to enter new line in terminal.
- \t use to add tab space in terminal.

4 Answer

Ans 3.1: \n use to enter the new line and \t use to add space like [tab]

Ans 3.2: In this case the error will get is:

```
        main.c:6:33: error: stray '\' in program
    6 |     printf("He lives in Bangkok" \n);
      |                                   ^
main.c:6:32: error: expected ')' before 'n'
    6 |     printf("He lives in Bangkok" \n);
      |            ~                       ^ ~
      |                                   )
```

So, to fix this Error. We have to move \n before double quote (")

Experiment IV

1 Problem description

- Answer following questions..

Q4.1: What values are shown correctly as an integer, a floating point, and a character?

Q4.2: Compare the result of %d and %5d. What is the effect of 'n' in %nd?

Q4.3: Compare the result of %f and %.4f. What is the effect of '.4' in %.4f?

Q4.4: Compare the result of %5.2f and %10.3f. What is the effect of 'n' and 'm' in %n.mf?

Q4.5: Compare the result of %17.4f and %-17.4f. What is the different between having and having no negative sign?

2 Problem program text

```c
#include <stdio.h>
int main(void)
{

    printf("-------------Question 1-------------------------------------\n");
    printf("Test output values\n");
    printf("an integer  :%d %d %d %d\n", 10,    -8, 0.5, 'a');
    printf("a float     :%f %f %f %f\n", 9.5,1.54,   7, 'd');
    printf("a character :%c %c %c %c\n", 'b', 'c',  70, 2.5);
    printf("-------------Question 2-------------------------------------\n");
    printf("%d\n", -71);
    printf("%5d\n", -71);
    printf("%d\n", 8800);
    printf("%5d\n", 8800);
    printf("%d\n", 123);
    printf("%5d\n", 123);
    printf("-------------Question 3-------------------------------------\n");
    printf("%f\n", 1.23456);
    printf("%.4f\n", 1.23456);
    printf("-------------Question 4 -----------------------------------\n");
    printf("%5.2f\n", 2.58321);
    printf("%5.2f\n", 2.5);

    printf("%10.3f\n", -9.6357);
    printf("%10.3f\n", -9.6);
    printf("-------------Question 5-----------------------------------\n");
    printf("%17.4f\n", -8.05715557);
    printf("%-17.4f\n", -8.05715557);

    return 0;
}
```

3 Answer

Ans4.1: Except the Character because there are Float and ASCII can't convert Float to Character. So the result will be:

Integer: [10 -8 0 97], Floating-Point: [9.500000 1.540000 0.000000 0.000000], and Character: [b c F]

If we want to show all output in Character, we have to change 2.5 to other value that doesn't be Float

Ans4.2: The effect of n (5) is the output of int in n width.

Ans4.3: The effect of .4 in %.4f is use only 4 digits of float and round the last digit.

Ans4.4: The effect between n (10) and m (.3) is the n is output a floating-point of n width. The m is how many digits of float.

Ans4.5: The effect on - and no - is what place to place the space. In (-) is place on the left (after the float).

End of Lab Experiment Week 1