

ESS111: Programming in C

LAB - 1

(Due by: 25/11/2020 before 11:59 pm)

(Note: only Part A will be evaluated)

PART A

Problem 1: Write a program that takes a temperature reading in the centigrade scale and outputs its equivalent value in the fahrenheit scale (give output up to 2 decimal places).

Input	Output
0	32.00
-10	14.00

(Sample Input/Output for Problem 1)

Problem 2: You are given three floats a b c as inputs which represent the length, the breadth of a rectangle and the radius of a circle, respectively. Write a program which gives the output: area of the rectangle, perimeter of the rectangle, area of the circle and circumference of the circle, respectively. (Make sure that output sequence is as mentioned above). (Assume $\pi = 3.14$) (Give output up to 2 decimal places)

Input	Output
9 6 1	54.00 30.00 3.14 6.28
8 12 10	96.00 40.00 314.00 62.8

(Sample Input/Output for Problem 2)

Problem 3: Write a program that takes n as input and gives the average of the squares of the first n natural numbers. (Give output up to 2 decimal places)

Input	Output
4	7.50
9	31.67

(Sample Input/Output for Problem 3)

Problem 4: Given two positive integers (read from the input), write a program to print the remainder and the quotient, respectively, when the first integer is divided by the second integer.

Input	Output
23 5	3 4
41 8	1 5

(Sample Input/Output for Problem 4)

PART B

[A] Which of the following are invalid C constants and why?

- | | | |
|--------------|---------------------|--------------|
| 1) '3.15' ✓ | 4) 35,550 ✓ | 7) 3.25e2 ✓ |
| 2) 2e-3 | 5) 'eLearning' ✓ | 8) "show" ✓ |
| 3) 'Quest' ✓ | 6) 2 ³ ✓ | 9) 4 6 5 2 ✓ |

[B] Which of the following are invalid variable names and why?

- | | | |
|--------------------|---------------|-------------------|
| 1) B'day | 6) int ✓ | 11) \$hello |
| 2) #HASH ✓ | 7) dot. ✓ | 12) number |
| 3) totalArea | 8) _main() ✓ | 13) temp_in_Deg |
| 4) total% ✓ | 9) 1st ✓ | 14) stack-queue ✓ |
| 5) variable name ✓ | 10) %name% ✓ | 15) salary |

[C] State whether the following statements are True or False:

1. C language was developed by Dennis Ritchie. ✓ T
2. Operating systems like Windows, UNIX, Linux and Android are written in C. ✓ T
3. C language programs can easily interact with hardware of a PC / Laptop. ✓ T
4. A real constant in C can be expressed in both Fractional and Exponential forms. ✓ T
5. A character variable can at a time store only one character. ✓ T
6. The maximum value that an integer constant can have varies from one compiler to another. ✓ T
7. Usually all C statements are written in small case letters. ✓ T
8. Spaces may be inserted between two words in a C statement. ✓ T
9. Spaces cannot be present within a variable name. ✓ T
10. C programs are converted into machine language with the help of a program called Editor. ✓ F
11. Most development environments provide an Editor to type a C program and a Compiler to convert it into machine language. ✓ T
12. int, char, float, real, integer, character, char, main, printf and scanf all are keywords. ✓ F

[D] Match the following pairs:

- | | |
|----------------|--------------------------|
| (a) \n | (1) Literal |
| (b) 3.145 | (2) Statement terminator |
| (c) -6513 | (3) Character constant |
| (d) 'D' | (4) Escape sequence |
| (e) 4.25e-3 | (5) Input function |
| (f) main() | (6) Function |
| (g) %f, %d, %c | (7) Integer constant |
| (h) ; | (8) Address of operator |
| (i) Constant | (9) Output function |
| (j) Variable | (10) Format specifier |
| (k) & | (11) Exponential form |
| (l) printf() | (12) Real constant |
| (m) scanf() | (13) Identifier |

[E] Point out the errors, if any, in the following programs:

(a)

```
int main( )  
{  
    int a ; float b ; int c ;  
  
    a = 25 ; b = 3.24 ; c = a + b * b - 35 ;  
}
```

(b)

```
#include <stdio.h>  
  
int main( )  
{  
  
    int a = 35 ; float b = 3.24 ;  
  
    printf ( "%d %f %d", a, b + 1.5, 235 ) ;  
}
```

no errors

(c)

```
#include <stdio.h>
```

```
int main( )
```

```
{
```

```
    int a, b, c ;
```

```
    scanf ( "%d %d %d", a, b, c ) ;
```

```
}
```

garbage value

(d)

```
#include <stdio.h>
```

```
int main( )
```

```
{
```

```
    int m1, m2, m3
```

```
    printf ( "Enter values of marks in 3 subjects" )
```

```
    scanf ( "%d %d %d", &m1, &m2, &m3 )
```

```
    printf ( "You entered %d %d %d", m1, m2, m3 )
```

```
}
```