



Sri Lanka Institute of Information Technology  
B. Sc (Hons). Degree in IT  
Year 1 – Semester 1 – 2020 – September Intake  
Introduction To Programming ( IT1010)  
Online 2  
Version A

Time : 1 hour 15 min

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- 1) Write a C program that uses nested loops to print the following figure.

```
a
bb
ccc
dddd
eeee
```

Note that ASCII value of 'a' is 97

(10 marks)

Save your program as *ITXXXXXXa.c*

- 2) You are asked to write a C program to calculate the increment given for the employees.

Write a function called **calcIncrement()** to calculate and return the increment given for the employees. The increment amount is 10% of the salary. Increment is given only to the employees who worked more than 2 years . Function prototype is given below.

```
float calcIncrement(float salary, int noofYearsWorked);
```

Write a function called **calcTotSalary()** to calculate the total salary.  
(total salary = salary + increment ).

```
float calcTotSalary(float salary, float increment);
```

In your main function enter the salary of an employee and the number of years worked from the keyboard. Display the increment and total salary as follows using the functions created above.

```
Enter Salary : .....
Enter no of years worked: .....
Increment: .....
Total Salary :.....
```

(10 marks)

Save your program as *ITXXXXXXb.c*



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**Online 2**  
**Version B**

**Time : 1 hour 15 min**

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- 1) Write a C program that uses nested loops to print the following figure.

```
aaaaa
bbbb
ccc
dd
e
```

Note that ASCII value of 'a' is 97

(10 marks)

Save your program as **ITXXXXXXa.c**

- 2) A hotel has decided to offer 10% discounts from hotel charge for the wedding packages during the festive season. Discount is valid only if the no of guests is more than 200.  
(Hotel charge = no of guests \* charge per guest)

You are asked to write a C program to calculate the discount given for wedding packages.

Write a function called **getDiscountPrice()** to get the discount for the wedding package by considering no of guests. Function should return the discount. Function prototype is given below.

```
float getDiscountPrice(int noOfGuests, float chargePerGuest);
```

Write a function called **getAmount()** to calculate and return the amount to be paid. Function prototype is given below.

Amount to be paid = (no of guests \* charge per guest )- discount

```
float getAmount(int noOfGuests, float chargePerGuest, float discount);
```

In your main function read the number of guests and the charge per guest from the keyboard and display the discount and the amount to be paid for the wedding package using the functions created above in the following format.

Enter no of guests: .....

Enter charge per guest: .....

Discount: .....

Amount to be paid: .....

Save your program as **ITXXXXXXb.c**

(10 marks)



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**Version C**

**Time : 1 hour 15min**

- 1) Write a C program that uses nested loops to print the following;

```
[ 1 1 1 ]
[ 1 1 2 ]
[ 1 2 1 ]
[ 1 2 2 ]
[ 2 1 1 ]
[ 2 1 2 ]
[ 2 2 1 ]
[ 2 2 2 ]
```

( 10 marks)

Save your program as **ITXXXXXXa.c**

- 2) A security firm has categorized their employees into 3 grades and an hourly rate is paid based on the grade as follows.

Grade	Hourly Rate (Rs)
1	100.00
2	200.00
3	300.00

Implement a function called **calculateWeeklySalary()** of an employee to find and return the weekly salary. Total no of hours worked during the week and the grade of the employee should be passed as a parameter. Function prototype is given below.

```
float calculateWeeklySalary(int grade, float hrsWorked)
```

Weekly salary = no of hours worked for the week \* hourly rate.

Implement a function called **printDetails()** to print the grade, hrs worked and the weekly salary of the employee. Function prototype is given below.

```
void printDetails(int grade, float hrsWorked, float salary)
```

In your main function, input the grade and the total no of hours worked during the week from the keyboard. Call **printDetails()** function and display the details.

Save your program as **ITXXXXXXb.c**

(10 marks)



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**Version D**

**Time : 1 hour 15 min**

- 1) Write a C program that uses nested loops to print the following;

```
[ 2 2 2 ]
[ 2 2 1 ]
[ 2 1 2 ]
[ 2 1 1 ]
[ 1 2 2 ]
[ 1 2 1 ]
[ 1 1 2 ]
[ 1 1 1 ]
```

( 10 marks)

Save your program as **ITXXXXXXa.c**

- 2) Unit price of 3 items are listed below

Item	Unit Price (Rs)
1	100.00
2	200.00
3	300.00

Implement a function called `calculateTotalCost()` to calculate and return the total cost.

Item no and the quantity purchased from that item should be entered as parameters.

Total cost = unit price \* quantity

Function prototype is given below.

```
float calculateTotalCost(int itemNo, int quantity)
```

Implement a function called `printDetails()` to print the item no, quantity and the total cost

Function prototype is given below.

```
void printDetails(int item no, int quantity, float  
totalCost)
```

In your main function, input item no and the quantity purchased from the keyboard. Call `printDetails()` function and display the details.

Save your program as **ITXXXXXXb.c**

(10 marks)



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**Version E**

**Time : 1 hour 15 min**

- 1) Write a C program to input a series of marks terminated by -99. If the marks are invalid (>100 or <0) you should print an error message and reenter the marks. Calculate the minimum mark and maximum mark entered.

(10 marks)

Save your program as **ITXXXXXXa.c**

- 2) Write a C program to convert the angle given in degrees to radians.  
Implement a function called `findRadianValue()` to convert the angle given in degrees to radians.  
Function prototype is given below.

```
float findRadianValue(float angleInDegrees);
```

Use the below formula to convert degrees to radians.

$\text{radian} = \pi/180 * \text{degrees}$       where  $\pi = 22/7$

Implement another function called `printRadianValues()` to print the radian of the given angles in degrees by using `findRadianValue()` function.

Function prototype is given below

```
void printRadianValues(void);
```

Display your answer in the below format.

Angle(degrees)	Angle(radians)
100	.....
120	.....
140	.....
160	.....
180	.....
200	.....

In your main function call `printRadianValues()` function to display the result.

Save your program as **ITXXXXXXb.c**

(10 marks)



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**Time : 1 hour**

**20 Marks**

A bank offers three types of saving accounts for their customers. The account types and annual interest is given below.

Type	Annual Interest rate
1	4%
2	7%
3	10%

- a) Implement a function called `calculateAmount()` to calculate and return the balance of the account at the end of the year. The account type and the balance at the beginning of the year should be passed as parameters.

Interest = Initial amount \* Annual interest rate / 100

Balance at the end of the year = Initial Amount + Interest

Function prototype is given below.

```
double calculateAmount(int type, double initial);
```

- b) Implement a function called `printDetails()` to print the amount of the account at the end of the year.

Function prototype is given below.

```
void printDetails(int type, double initial, double balance);
```

- c) Implement a function called `checkEligibility()` to return the customer eligibility (Eligible – 1, Not eligible - 2) for the raffle draw that organized by the bank at the end of the year. The account holders who have minimum of 5000/= in the account at the end of the year are eligible for the raffle draw. The account balance as at end of the year will be passed as parameter for this function.

Function prototype is given below.

```
int checkEligibility(double balance);
```

- d) In your main program,
1. Write two assert statements to test `checkEligibility()` function.
  2. Input account type and the initial amount of **five account holders** and display the calculated amount of each account holder using `printDetails()` function with their eligibility. To display their eligibility for the raffle draw, use `checkEligibility()` function.
- Save your program as **ITXXXXXX.c**