

National University of Computer and Emerging Sciences



Laboratory Manual
for
Programming Fundamentals

Course Instructor	Mr. Waqas Manzoor
Lab Instructor(s)	Miss Shazia Ahmed Mr. Adeel Qayyum
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Department of Computer Science
FAST-NU, Lahore, Pakistan

Arithmetic binary operator:

Operations	Answer
Int divided by int	int
Foat divided by float	Float
Double divided by double	Double
Int divided by float	float

Practice Questions.

1. Implement the following equations and check results.

int a, int b, float c, double d;

- a. a/b
- b. b/c
- c. c/d
- d. a/d

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Problem 1:

You have to develop a program which approximates salary of a candidate for a certain job. Salary depends upon its qualification and experience in related field. Only male candidates with age more than 25 years are preferred for this job. If candidate is a fresh graduate, salary will be in range of 25-40K, but if his qualifications are MS or PhD, then person with experience of more than 5 years will get salary 70k+ otherwise 40k to 70k.

Sample Output:

Enter age: 28

Enter experience in years: 3

Gender (M for male, F for female): M

Qualification (1 for BS, 2 for MS, 3 for PhD)

Your salary is: 75000

Problem 2:

Write a C++ program of a Body Mass Index (BMI) calculator application that reads the user's weight and height and then calculates and displays the user's body mass index. The formula for calculating BMI is: $BMI = (Weight \text{ in Kilograms} / (Height \text{ in Meters} \times Height \text{ in Meters}))$ Also, the program should display the following information from the scale provided below. For the calculated BMI VALUES Underweight: less than 18.5; Normal: between 18.5 and 24.9; Overweight: between 25 and 29.9; Obese: 30 or greater Note: Your program should check that the height and weight entered are not negative. If the entered data is incorrect display a message accordingly.

Example:

Height= 1.7

Weight in kilogram= 65

Output:

BMI=22.5

Normal on BMI scale

Height= 1.53

Weight in kilogram= 72

Output:

BMI=30.7

Obese on BMI scale

Problem 3: Use nested if.....else (Your solution without nested if will not be considered)

Write a program to find the price of the pizza per square inch. Equation to calculate area is

$$Area = \pi * (r * r)$$

The flavor, radius and their price is as follow:

Flavor	6 inches	9 inches	12 inches
Tikka	Rs:800/-	Rs:900/-	Rs:1000/-
Fajita	Rs:700/-	Rs:800/-	Rs:900/-
Supreme	Rs:1000/-	Rs:1200/-	Rs:1400/-

Ask if it's customer's birthday? If it is, then they get a 10% discount. (Do not use logical operators)

Sample output:

Select size (6, 9 or 12 inches): 9

Select Flavor (T: tikka, F: fajita, S: Supreme): F

isYour Birthday(Y: yes, N: no): N

Price per square inch: 0.3 rupees

Problem 4:

A box of cookies can hold 35 cookies, and a container can hold 150 boxes of cookies. Write a program that prompts the user to enter the total number of cookies, the number of cookies in a box, and the number of cookie boxes in a container. The program then outputs the number of boxes and the number of containers to ship the cookies. Note that each box must contain the specified number of cookies, and each container must contain the specified number of boxes. If the last box of cookies contains less than the number of specified cookies, you can discard it and output the number of leftover cookies. Similarly, if the last container contains less than the number of specified boxes, you can discard it and output the number of leftover boxes.

Sample Output:

Enter number of cookies: 1250

Enter cookies per box: 20

Enter boxes per container: 10

Number of boxes: 62 boxes and 10 cookies
Number of containers: 6 Containers and 2 boxes

Problem 6:

Write a C++ program that reads an 'n' number then finds and prints the sum of even and odd integers up to nth number. (Use While loop)

Sample Output:

Enter nth number: 10

Sum of evens = 30

Sum of odds = 25

Problem 7: (use While loop)

Print the Fibonacci sequence (0,1,1,2,3,5,8,13,21,34,...) till the N member. Take N from user input. Fibonacci sequence is given by formula: sum the last two numbers to get the current.

$$F_n = F_{n-1} + F_{n-2}$$

Sample Output:

Enter nth number: 10

0,1,1,2,3,5,8,13,21,34

Problem 8:

The factorial of a positive integer n is equal to $1*2*3*...n$. You will learn to calculate the factorial of a number using While loop.

Sample Output:

Enter nth number: 7

$1*2*3*4*5*6*7 = 5040$