

National University of Computer and Emerging Sciences

Practice Questions

Exercise No 2

LOOPS

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Programming Fundamentals

(CS002)

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| * Course Instructor | Mr. Yousaf |
| * Semester | Spring 2023 |

# Instructions:

1. Make a word document with the convention “SECTION\_ ROLLNO\_P1”.
2. Plagiarism is strictly prohibited, if you take a code snippet off the internet, mention its reference.
3. Do not discuss solutions with one another.
4. Submit word file on GOOLE CLASSROOM.

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| **EXAMPLE** |

**C++ Program to print hello world 10 times using different loops.**

#include<iostream>

using namespace std;

int main()

{

int count = 0;

while (count < 10)

{

cout << "hello world";

count++;

}

cout << endl;

count = 0;

do

{

cout << "hello world";

count++;

} while (count < 10);

cout << endl;

for (int i = 0;i < 10;i++)

{

cout << "hello world";

}

}

**Note:** All the questions must be solved with all three types of loops (i.e., While, Do-While and FOR).

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| **PROBLEM 1 |** |

**GOAL:** Write a C++ program to print first ‘n’ odd numbers and ‘m’ even numbers.

Where values of ‘n’ and ‘m’ is entered by the user.

**EXAMPLE**

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**Input**

oddN = 6;

evenN = 3;

**Output:**

1, 2, 3, 4, 5, 6, 7, 9, 11

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| **PROBLEM 2 |** |

**GOAL:** Write a C++ program to print all digits of a number “N”;

Where ‘N’ is entered by the user. The number ‘N’ can of any length.

**EXAMPLE**

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**Input**

N = 1978

**Output:**

1, 9, 7, 8

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| **PROBLEM 3 |** |

**GOAL:** Write a program that prints the numbers from 1 to 100, but replaces multiples of 3

with "**FAST**", multiples of 5 with "**NUCES**", and multiples of both 3 and 5 with "**FAST-NUCES**".

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| **PROBLEM 4 |** |

**GOAL:** **Find the Fibonacci series till “n”**

Where ‘N’ is entered by the user.

**EXAMPLE**

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**Input**

N = 7

**Output:**

0, 1, 1, 2, 3, 5, 8

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| **PROBLEM 5 |** |

**GOAL:** Write a program that calculates the sum of the numbers until the user enters a number with a single digit.

**EXAMPLE**

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**Input**

N = 123

N = 3480

N = 92

N = 6

**Output:**

3695

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| **PROBLEM 6 |** |

**GOAL:** Hey FASTIAN Can you help me solve a problem. We are four players, I want “n” number of turns passing the ball in a cycle. Player no. 1 holds the ball, then passes the ball to player no. 2. After turn 3 the 4th player holds the ball. After “n” number of turns which player holds the ball? Use loops to implement the question.

Where ‘N’ is entered by the user.

**EXAMPLE**

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**Input**

n = 6

**Output:**

Player “3” holds the ball.

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| **PROBLEM 7 |** |

Write a program that takes a number and checks if it is a perfect number or an abundant number.

**EXAMPLE**

**\_\_\_\_\_\_\_\_\_\_**

Perfect number is a number whose factors add up to itself. Abundant number is a number whose factors add up to more than itself.

**Input**

N = 6

**Output:**

Yes, 6 is a perfect number (as 1 + 2 + 3 = 6)

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| **PROBLEM 8 |** |

**GOAL:** **Print multiplication table of an entered alphabet character.**

**EXAMPLE**

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**Input**

c = ‘A’

**Output:**

A x 1 = 65

A x 2 = 130

.

.

.

A x 10 = 650

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| **PROBLEM 9 |** |

**GOAL:** Write a C++ program to display all the prime numbers between “n” and “m”.

**EXAMPLE**

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**Input**

m = 5;

n = 17;

**Output:**

5, 7, 11, 13, 17

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| **PROBLEM 10 |** |

**GOAL:** **Find the largest among seven different numbers entered by the user. You cannot store the numbers in separate variables.**

Where numbers are entered by the user.

**EXAMPLE**

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**Input**

1, 5, 3, 4, 6, 2, 0

**Output:**

Number “6” is the largest among the seven.

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| **PROBLEM 11 |** |

**GOAL:** A mathematician is trying to destroy the basic logics. He hires you to do the job for him.

**The job is:**

The user enters 10 numbers and asks to calculate their sum. You have to take the inverse of the even numbers so that when they add up, they give a different answer.

**EXAMPLE**

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**Input**

N1 = 2, N2 = 7

(Answer should not be 9)

**Output:**

5 (i.e., -2+7, **as inverse of 2 is -2**)

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| **PROBLEM 12 |** |

**GOAL:** Write a program that takes a number and prints out its binary representation in 4 bits using a loop.

**EXAMPLE**

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**Input**

N = 5

**Output:**

0101

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| **PROBLEM 13 |** |

**GOAL:** Covert “**FAST-NUCES**” into a number, sum of all its characters using a loop. Use ASCII values. Make a loop run from 0 till 127 and match them, whether the current number is one of the characters of **FAST-NUCES** or not, and then simply add that to the sum.

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| **PROBLEM 14 |** |

**GOAL:** Write a C++ program to check where a number is palindrome or not, the number can be of any length.

**EXAMPLE**

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A palindrome number is a number that remains the same when its digits are reversed.

**Input**

23432

**Output:**

Yes, 23432 is a palindrome number.

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| **PROBLEM 15 |** |

**GOAL:** Write a program that prints all the strong numbers till n.

Where n is entered by the user.

**EXAMPLE**

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Strong number is a number whose factorial of digits sum up to itself.

**Input**

N= 500

**Output:**

1, 2, 145

(**145** as 1! + 4! + 5! = 145)

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| **PROBLEM 16 |** |

**GOAL:** **The user enters two numbers. Your task is to print the number of days in the month of February of every year between the two numbers. (Remember to check whether the year is a leap year or not).**

**Hint: All years which are perfectly divisible by 4 are leap years except for century years (years ending**

**with 00), which are leap years only if they are perfectly divisible by 400.**

**Leap years: 2020, 1600, 2004 etc.**

**Non-Leap years: 1700, 1983, 2001 etc.**

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| **PROBLEM 17 |** |

Solve for parts (a, b, c, d)

* Repeatedly print the value of the variable xValue, decreasing it by 0.5 each time, as long as xValue remains positive.
* Print the square roots of the first 25 odd positive integers.
* Repeats a block of code as long as the user indicates they want it to.
* Drive the user crazy by insisting they re-enter a particular input no matter what they enter. Be creative.

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| **PROBLEM 18 |** |

**GOAL:** Write a program in C++ to Check Whether a Number can be Express as a Sum of Two Prime Numbers.

**EXAMPLE**

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**Input**

7

**Output:**

Yes (as 2 and 5 are two prime numbers which sum up to **7**)

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| **PROBLEM 19 |** |

**GOAL:** Write a program in C++ to find the sum of the series **1 + 1/2^2 + 1/3^3 + ... + 1/n^n.**

**EXAMPLE**

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**Input**

Input the value for nth term: **5**

**Output:**

1/1^1 = 1  
1/2^2 = 0.25  
1/3^3 = 0.037037  
1/4^4 = 0.00390625  
1/5^5 = 0.00032  
The sum of the above series is: **1.29126**

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| **PROBLEM 20 |** |

**GOAL:** Make the following triangle with asterisk. Also, the size of the triangle

will be determined by the user.

**EXAMPLE**

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**Input**

5

**Output:**

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*“Optimism is an occupational hazard of programming: feedback is the*treatment*. “****Kent Beck***