

CSC107 2.0 Computer Programming - Laboratory I

Lab sheet 09

To understand and practice the use of **FOR** loop through simplified real-world scenarios.

1. Complete the below code to print 10 numbers and execute it.

```
#include <stdio.h>

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int main() {
    int i;
    .....(i = .....; i ..... 10; ..... ) {
        printf("%d ", .....);
    }
    return 0;
}
```

2. Below is a program in C to display the cube of the number up to a user request. Copy the code into IDE and complete the missing syntax. Sample output is given below.

```
#include <stdio.h>
int main()
{
    // declare integer variables i and intTerms
    int i,intTerms;
    // read user input
    printf("Enter intTerms");
    scanf("%d",&intTerms);

    // initialize the loop and continue up to intTerms

    for(i=0;i<=intTerms;i++)
        printf("%d\n",i);
    return 0;
}
```

3. Write a simple C program to print the odd numbers from 1 to 50. Then modify the program to ensure that only the even numbers from 1 to 50 are printed.

4. Consider the following C program

```
int main() {
```

```

    int i;
    for (i = 1; i >= 0; i++) {
        printf("%d ", i);
    }
    return 0;
}

```

- a) Identify the mistake in the loop condition that causes an infinite loop.
 - b) Modify the loop condition to ensure that the loop terminates after printing the numbers from 1 to a certain limit requested by the user.
5. Write a program that prompts the user to enter the number of students and each student's score, and finally displays the highest score.
 6. a. Write a program that displays the following table (note that 1 kilogram is 2.2 pounds):

Kilograms	Pounds
1	2.2
3	6.6
...	
197	433.4
199	437.8
 - b. Improve the above program to displays the following two tables side by side

Kilograms	Pounds		Pounds	Kilograms
1	2.2		20	9.09
3	6.6		25	11.36
...				
197	433.4		510	231.82
199	437.8		515	234.09
 7. Write a program that displays all the numbers from 100 to 1,000, ten per line, that are divisible by 5 and 6. Numbers are separated by exactly one space.
 8. Write a program that prints the characters in the ASCII character table from ! to ~. Display ten characters per line. Characters are separated by exactly one space.
 9. Suppose that the tuition for a university is Rs 250,000 this year and increases 5% every year. In one year, the tuition will be Rs 262 500. Write a program that computes the tuition in ten years and the total cost of four years' worth of tuition after the tenth year.

10. Write a program that lets the user enter the loan amount and loan period in number of years and displays the monthly and total payments for each interest rate starting from 5% to 8%, with an increment of 1/8 or a specific interest rate.

$$\text{monthlyPayment} = \frac{\text{loanAmount} * \text{monthlyInterestRate}}{\frac{1}{(1 + \text{monthlyInterestRate})^{\text{numberOfYears} * 12}}}$$
$$\text{totalPayment} = \text{monthlyPayment} * \text{numberOfYears} * 12$$

Here is a sample run

Loan Payment Calculator

1. Display payments for interest rates from 5% to 8% with an increment of 1/8%
 2. Enter a specific interest rate to calculate payments
- Enter your choice (1 or 2):

Option 1

Interest Rate	Monthly Payment	Total Payment
---------------	-----------------	---------------

5.000%	XXXX.XX	XXXXXXX.XX
5.125%	XXXX.XX	XXXXXXX.XX
...		
8.000%	XXXX.XX	XXXXXXX.XX

Option 2 -Input and then output

Enter the loan amount: 500000

Enter the loan period in number of years: 15

Enter the annual interest rate (e.g., 7.25 for 7.25%): 6.75

For an interest rate of 6.750%:

Monthly Payment: XXXX.XX

Total Payment: XXXXXX.XX