

CSE 102 - Computer Programming

Spring 2016

Homework #3

Due Date: March 10, 23:55

In this homework you will improve your skills in conditions, loops and functions in C programming. Submit your homework via KADI system.

You will write a program which asks users for an integer and checks if the number is an odd, a factorial or a narcissistic number, depending on the user choice. The program will keep running until the user wants to exit by entering y. Example run of the program should look like:

```
*****
*                               *
*           WELCOME!           *
* This program checks whether the given number      *
* is an odd, a factorial or a narcissistic number  *
*                               *
*****

Please enter a positive integer : -5
The entered number is not positive.
Do you want to continue (y/n)? y

Please enter a positive integer : 720
Which property would you like to check?
1)Odd number
2)Factorial number
3)Narcissistic number
Please enter(1/2/3): 2
720 is a factorial number !
Do you want to continue (y/n)? y

Please enter a positive integer : 24
Which property would you like to check?
1)Odd number
2)Factorial number
3)Narcissistic number
Please enter(1/2/3): 1
24 is not an odd number !
Do you want to continue (y/n)? y

Please enter a positive integer : 9
Which property would you like to check?
1)Odd number
2)Factorial number
3)Narcissistic number
Please enter(1/2/3): 3
9 is narcissistic number !
Do you want to continue (y/n)? n
Good bye !
```

ODD

Definition: A number is odd if it is not divisible by 2.

Numbers that are not odd are even. Compare with another pair -- evil and odious numbers.

First ten: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19

There are 5000 odd numbers below 10,000.

FACTORIAL

Definition: The n-th factorial is the product of the first n natural numbers.

The factorial deserved an exclamation mark for its notation: $k! = 1*2*3*...*k$.

First ten: 1, 2, 6, 24, 120, 720, 5040, 40320, 362880, 3628800

There are 7 factorials below 10,000.

NARCISSISTIC

Definition: A k-digit number n is called narcissistic if it is equal to the sum of k-th powers of its digits. They are also called Plus Perfect numbers.

First ten: 1, 2, 3, 4, 5, 6, 7, 8, 9, 153

There are 16 narcissistic numbers below 10,000.

NOTES:

- Submit a whole program, i.e. including your helper functions and the main function.
- There will be no automatic testing on KADI **for this homework**. Therefore, formatting details such as spaces and alignment are not important. However, your program should work exactly as the example run given above.
- Use the structures you learned such as loops, conditions and functions whenever needed. The usage of these structures is as important as the correct execution of your program.
- The assignment must be your original work. Duplicate or very similar assignments are both going to be considered as cheating.
- Ask your questions via moodle.