

Algorithms & Programming

Kotlin - Loops tasks



Yevhen Berkunskyi, NUoS
eugeny.berkunsky@gmail.com
<http://www.berkut.mk.ua>

Task №1

Calculate this:

$$\underbrace{\left(\left(\dots \left((x+a)^2 + a \right)^2 + \dots + a \right)^2 + a \right)^2 + a}_n$$



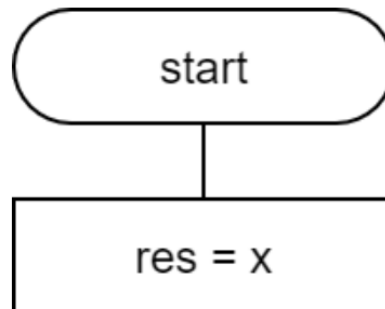


But before we start...

Task №1

Calculate

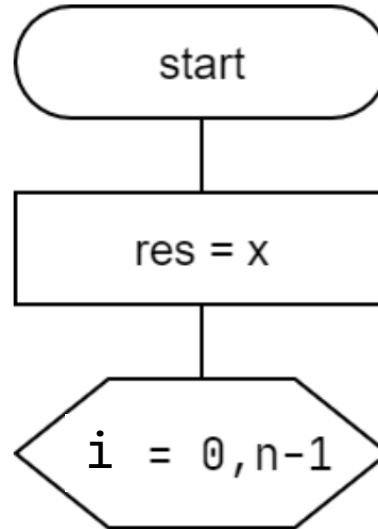
$$\underbrace{\left(\left(\dots \left((x+a)^2 + a \right)^2 + \dots + a \right)^2 + a \right)^2 + a}_n$$



Task №1

Calculate

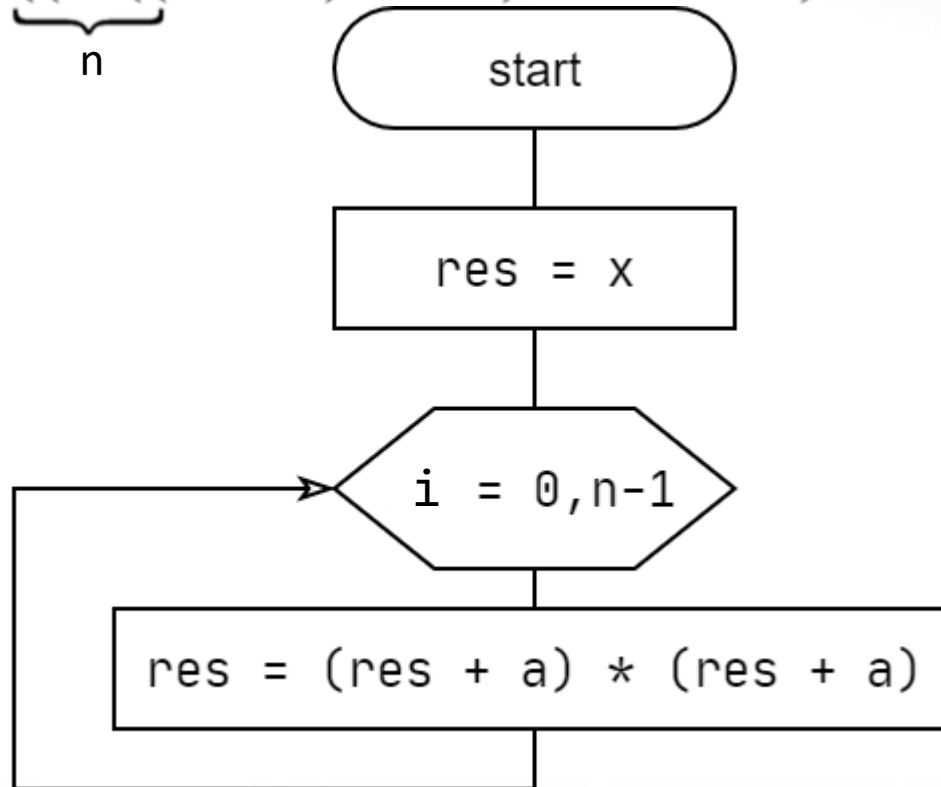
$$\underbrace{\left(\left(\dots \left((x+a)^2 + a \right)^2 + \dots + a \right)^2 + a \right)^2 + a}_n$$



Task №1

Calculate

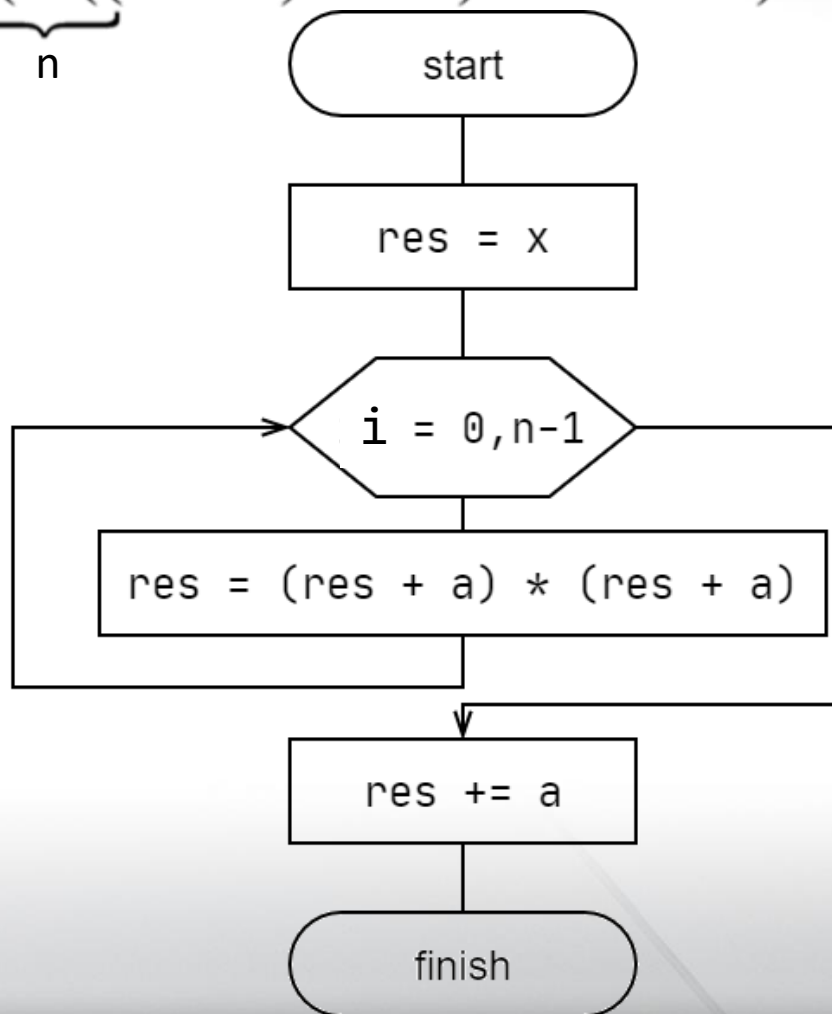
$$\underbrace{\left(\left(\dots \left((x+a)^2 + a \right)^2 + \dots + a \right)^2 + a \right)^2 + a}_n$$

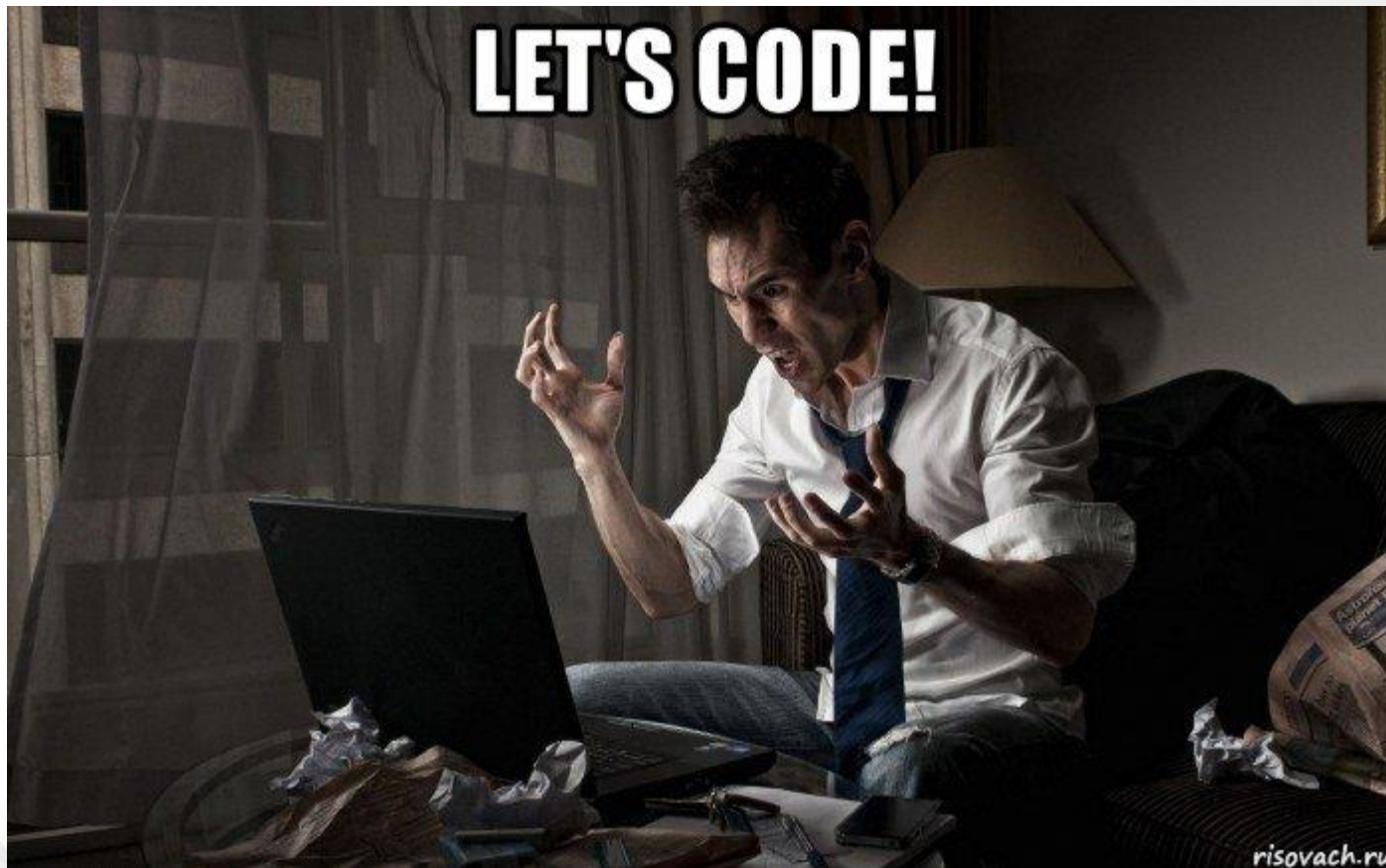


Задача №1

Calculate

$$\underbrace{\left(\left(\dots \left((x+a)^2 + a \right)^2 + \dots + a \right)^2 + a \right)^2 + a}_n$$





Task №2

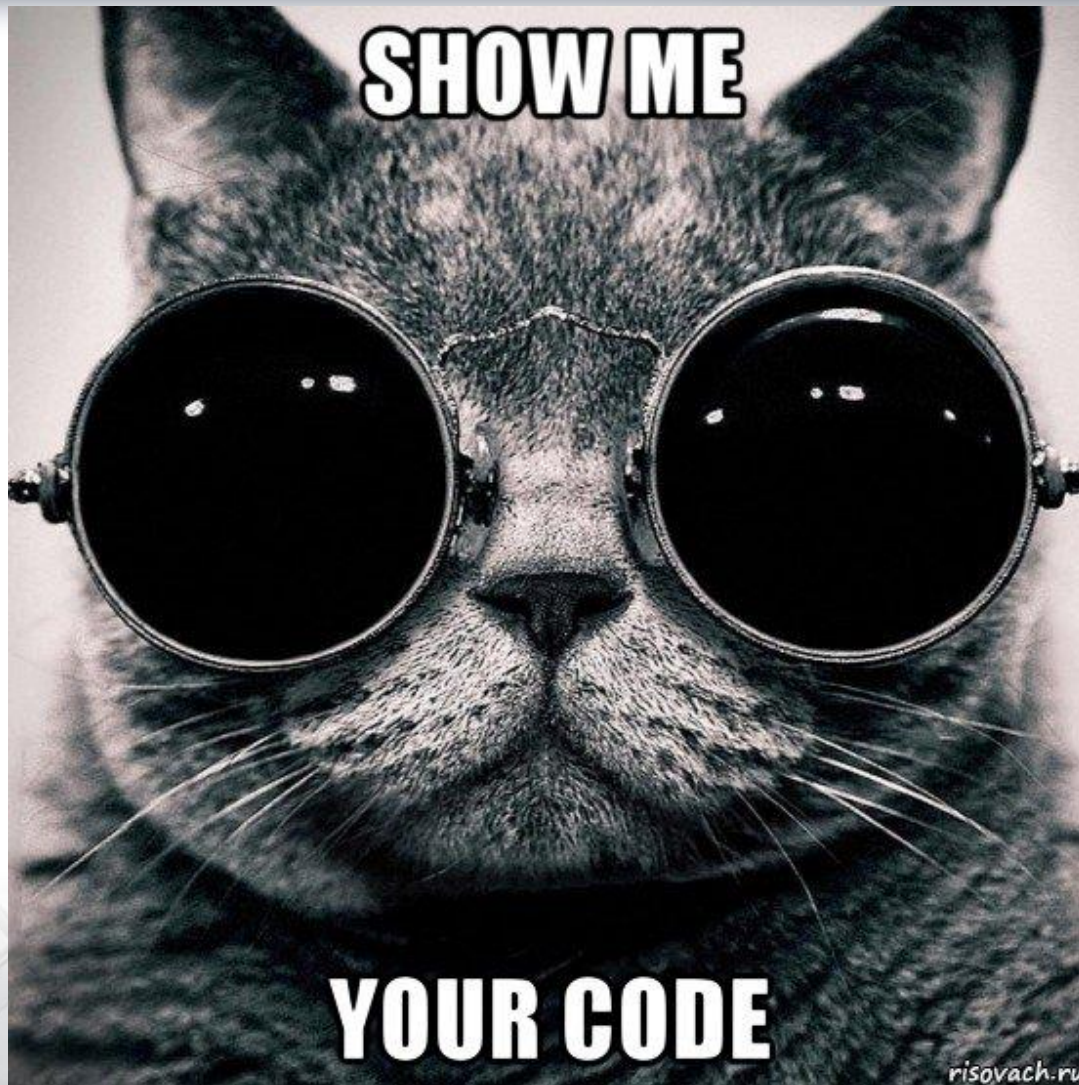
Calculate

$$x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \frac{x^9}{9!} - \frac{x^{11}}{11!} + \frac{x^{13}}{13!}.$$





НАЦІОНАЛЬНИЙ
УНІВЕРСИТЕТ
КОРАБЛЕБУДУВАННЯ
ІМЕНІ АДМІРАЛА МАКАРОВА



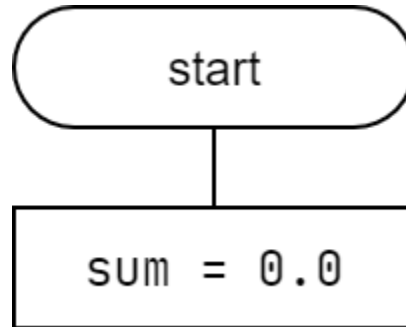
risovach.ru



Task №2

Calculate

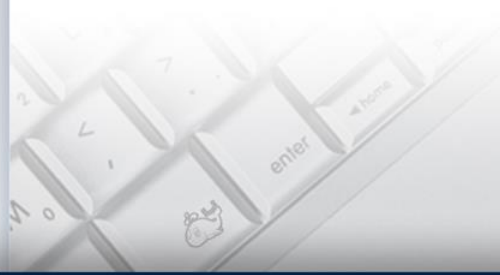
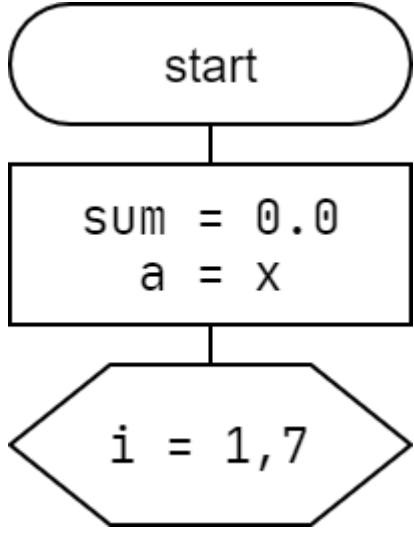
$$x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \frac{x^9}{9!} - \frac{x^{11}}{11!} + \frac{x^{13}}{13!} .$$



Task №2

Calculate

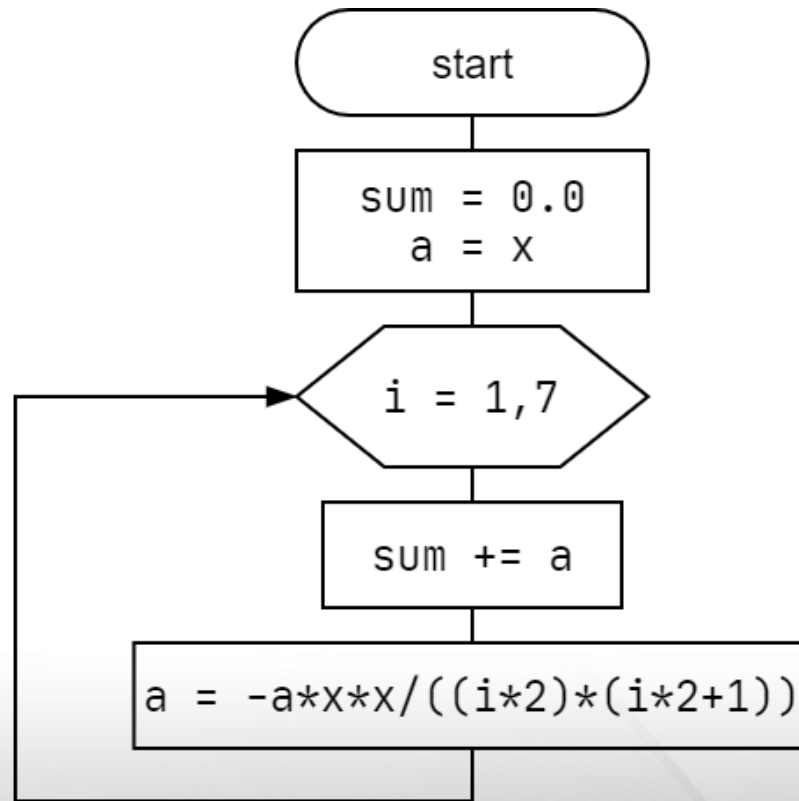
$$x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \frac{x^9}{9!} - \frac{x^{11}}{11!} + \frac{x^{13}}{13!} .$$



Task №2

Calculate

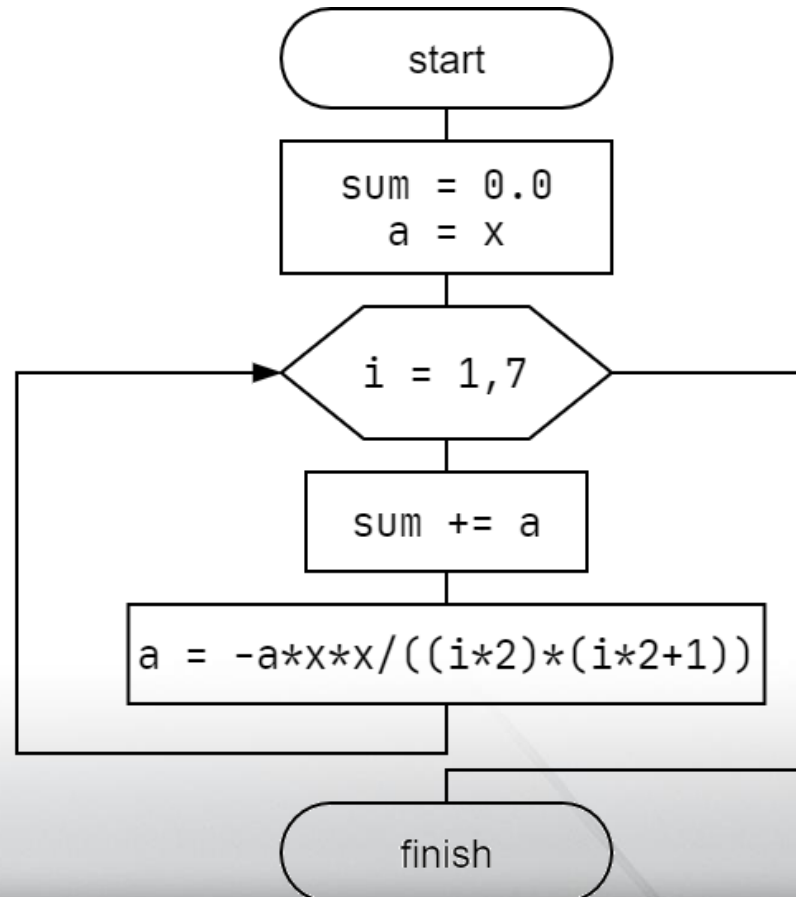
$$x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \frac{x^9}{9!} - \frac{x^{11}}{11!} + \frac{x^{13}}{13!}.$$



Задача №2

Calculate

$$x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \frac{x^9}{9!} - \frac{x^{11}}{11!} + \frac{x^{13}}{13!} .$$



Task №3

Calculate

$$\sin x + \sin^2 x + \dots + \sin^n x ;$$

$$\sin x + \sin x^2 + \dots + \sin x^n ;$$

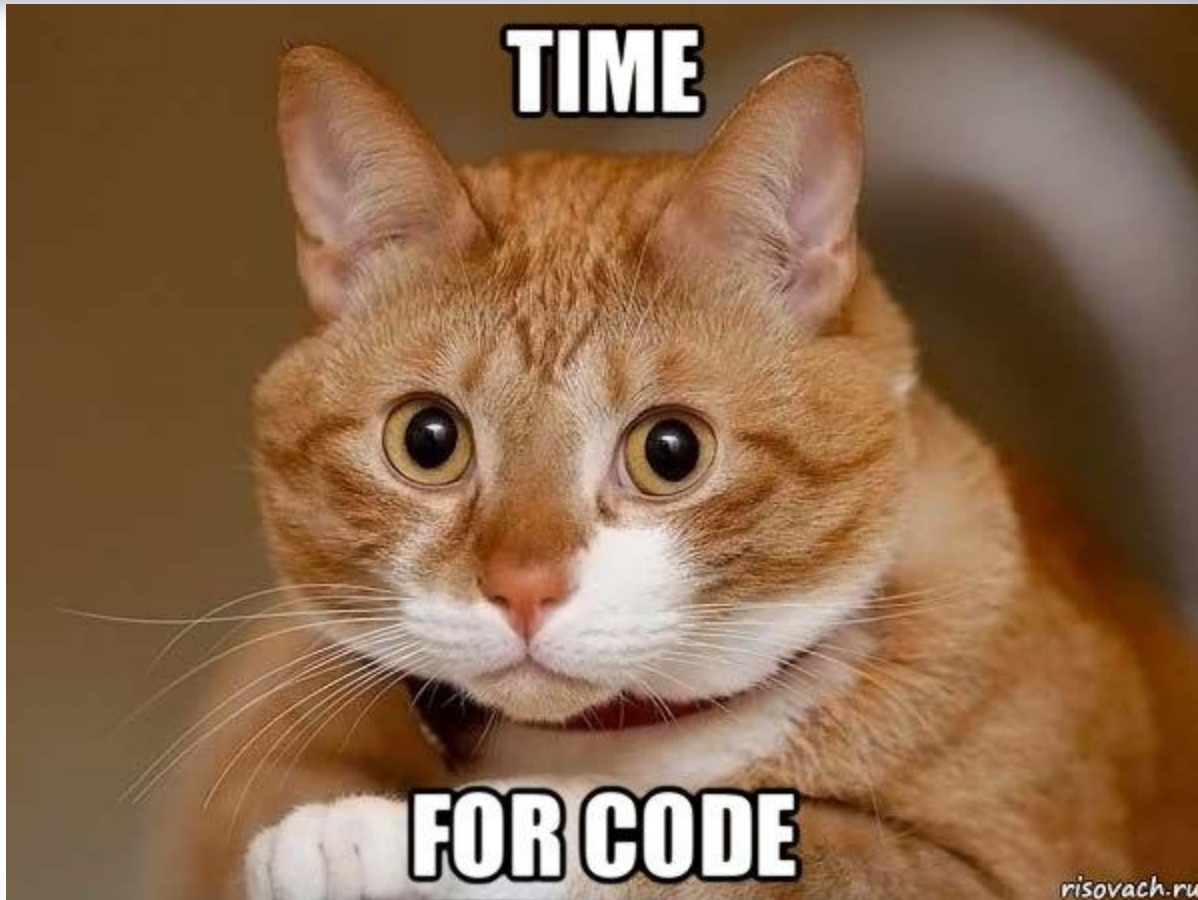
$$\sin x + \sin \sin x + \dots + \underbrace{\sin \sin \dots \sin x}_n$$

A natural number n is given:

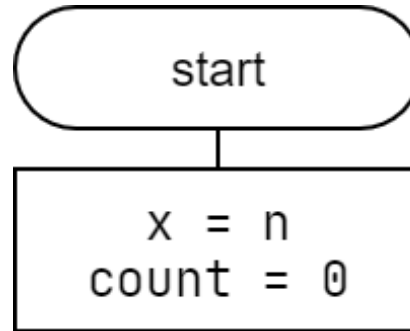
- a) Count digits in this number.*
- b) Calculate the sum of its digits.*
- c) Find the first digit of a number*



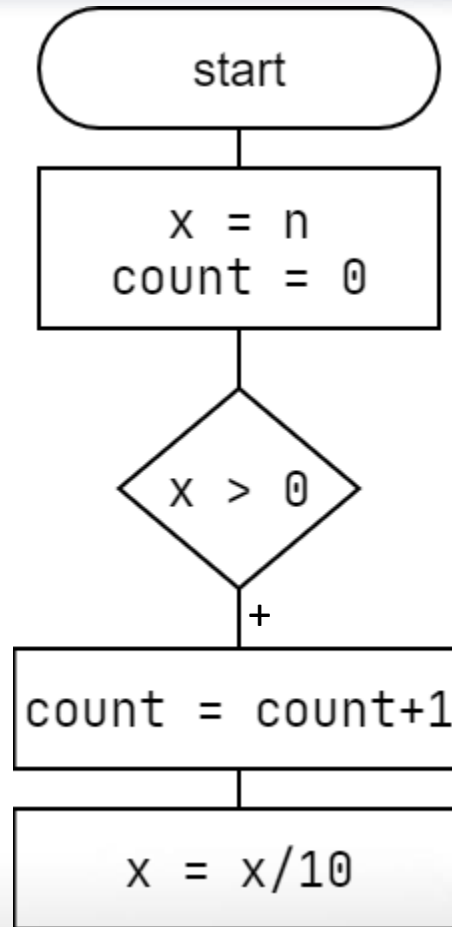
НАЦІОНАЛЬНИЙ
УНІВЕРСИТЕТ
КОРАБЛЕБУДУВАННЯ
ІМЕНІ АДМІРАЛА МАКАРОВА



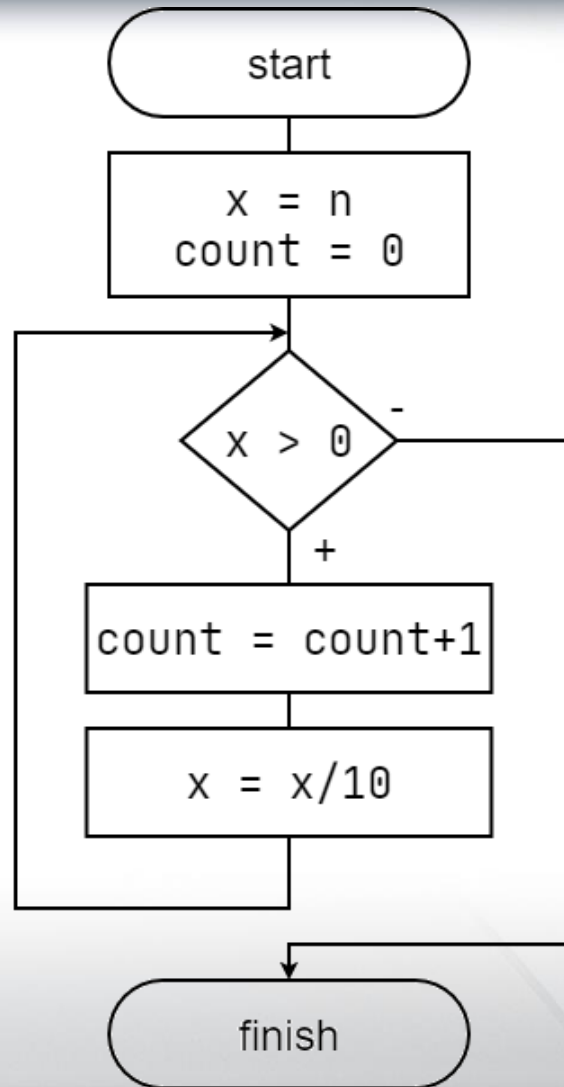
Count digits in the number n



Count digits in the number n



Count digits in the number n



Task №5

A natural number n is given. Calculate:

$$\sum_{k=1}^n \frac{1}{(2k+1)^2}$$

$$\sum_{k=1}^n \frac{(-1)^k}{(2k+1)k};$$

$$\sum_{k=1}^n \frac{(-1)^{k+1}}{k(k+1)}$$

$$\sum_{k=0}^n \frac{(-1)^k (k+1)}{k!}$$

$$\sum_{k=m}^n f_k = f_m + \dots + f_n \text{ (with } n \geq m)$$

Task №6

- 2 natural numbers are given.
- Calculate greatest common divisor of them.



НАЦІОНАЛЬНИЙ
УНІВЕРСИТЕТ
КОРАБЛЕБУДУВАННЯ
ІМЕНІ АДМІРАЛА МАКАРОВА



QUESTIONS

& ANSWERS

Algorithms & Programming

Kotlin - Loops tasks



Yevhen Berkunskyi, NUoS
eugeny.berkunsky@gmail.com
<http://www.berkut.mk.ua>