ERC20 Tokens - allowed, transferFrom(...) and approve(...)

- transfer() function is used for sending tokens from one user to another, but it doesn’t work well when tokens are being used to pay for a function in a smart contract;

- ERC20 standard defines a mapping data structure named allowed and 2 functions approve(...) and transferFrom(...) that permit a token owner to **give another address approval to transfer up to a no. of tokens** known as allowance.

  Allowances for an address can only be set by the owner of that address, ensuring that no-one can use the allowance feature to steal tokens.

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Let's imagine there are 2 users **A** and **B. A has 1000 tokens and wants to give permission to B,** which in most cases is a contract, **to spend 100 of them** or in other words to give permission to B to transfer 100 tokens from A account to his account.

1. A, the owner, will call approve(address_of_B, 100). After that the allowed data structure will contain the following information: allowed[address_of_A][address_of_B] = 100

2. If B wants to later transfer 20 tokens from A to his account, B will execute the transferFrom() function in this way: transferFrom(address_of_A, address_of_B, 20).

After calling the transferFrom() function (by B) the balance of A decreased with 20 and the balance of B increased with 20 tokens and the allowed data structure will contain the following info: allowed[address_of_A][address_of_B] = 80