1.8 **Ethereum Turing Completeness**

1. Ethereum can compute any algorithm that can be computed by any Turing Machine, given the limitations of the finite memory.
2. Groundbreaking innovation is to combine the general-purpose computing architecture of a stored programmed computer with a decentralize blockchain, thereby creating a distributed single-state(singleton) computer.
3. Ethereum program run everywhere, yet a common state that is secured by rules of consensus.
4. The fact that Ethereum is Turing complete means that any program of any complexity can be computed by Ethereum.
5. Flexibility of computing any complexity brings some security and resource management problems.
6. Turing proved that you cannot predict whether a program will terminate by simulating it on a computer.
7. Turing complete system can run in infinite loop a term used (in oversimplification) to describe a program that does not terminate and the whole blockchain system will be hanged.