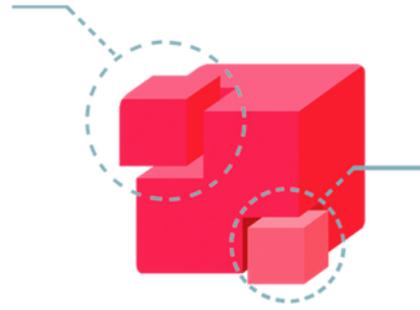


Computational Thinking

Computational Thinking is a system of understanding and solving problems in a logical way that people and computers can understand. It is the ability to integrate human creativity and insight with machine computing

Decomposition



- Before computers can solve a problem, the problem and the ways in which it can be resolved must be understood. Decomposition helps by breaking down complex problems into more manageable parts. It involves breaking down a complex problem or system into smaller parts that are more manageable and easier to understand. The smaller parts can then be examined and solved, or designed individually, as they are simpler to work with.

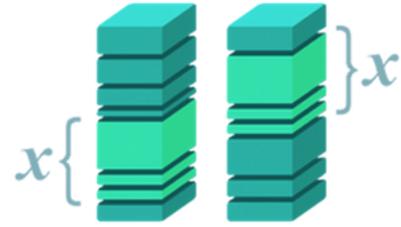
FACTORS OF 64



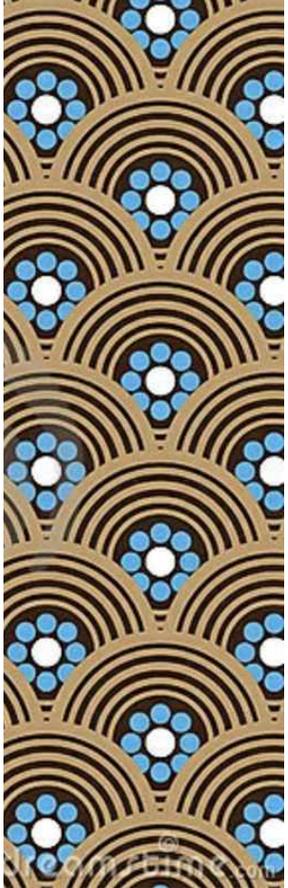
1, 2, 4, 8, 16, 32, 64

Pair Factors	Prime Factorization
1 x 64	$2 \times 2 \times 2 \times 2 \times 2 \times 2$
2 x 32	2^6
4 x 16	
8 x 8	

Pattern Recognition



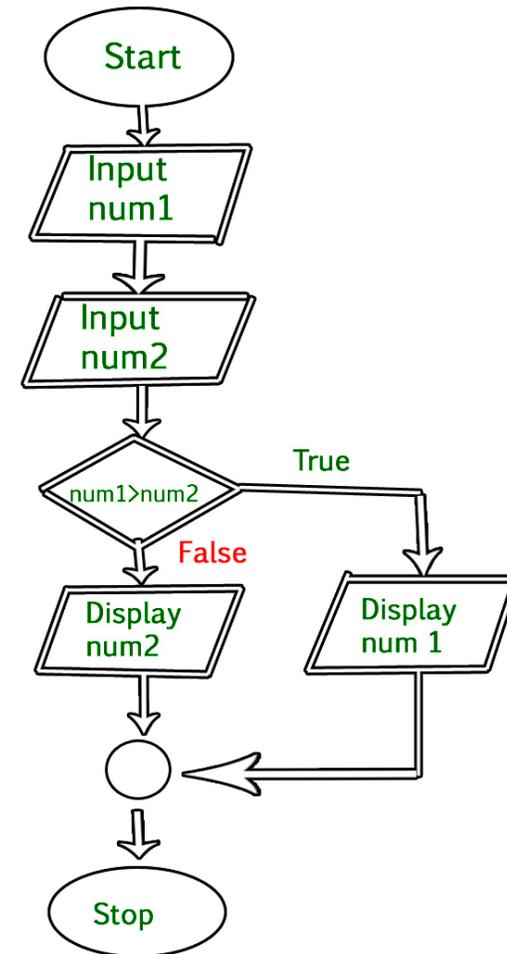
- When we decompose a complex problem we often find patterns among the smaller problems we create. The patterns are similarities or characteristics that some of the problems share.
- Pattern recognition is one of the four cornerstones of Computer Science. It involves finding the similarities or patterns among small, decomposed problems that can help us solve more complex problems more efficiently.



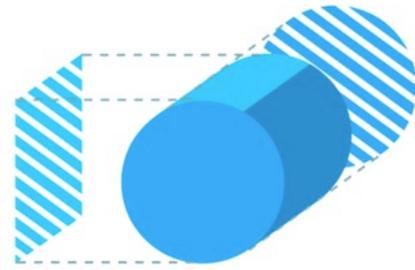
Algorithmic Thinking



- An algorithm is a step-by-step instructions to solve a problem. If you can tie shoelaces, make a cup of tea or prepare a meal then you already know how to follow an algorithm..
- In an algorithm, each instruction is identified and the order in which they should be carried out is planned. Algorithms are often used as a starting point for creating a computer program, and they are sometimes written as a flowchart or in pseudocode.
- If we want to tell a computer to do something, we have to write a computer program that will tell the computer, step-by-step, exactly what we want it to do and how we want it to do it. This step-by-step program will need planning, and to do this we use an algorithm.



Abstraction



- Abstraction involves identifying and extracting the relevant information to define the main idea, by filtering out – the characteristics that we don't need in order to focus on those that we do, so as to solve the problem.
- In Computational Thinking, when we Decompose problems, we then look for patterns among and within the smaller problems that make up the complex problem.

