

# Computer Science

What is a computer?

- Information in, output out
- Database of information
- Electronic machine, do different tasks, <sup>Coded/programmed</sup>
- Solves problems

Computation : processing/transforming information.

Given a starting number  $n$  :

As long as  $n \geq 1$  :

Conditional

- If  $n$  is even, divide it by 2
- Otherwise, if  $n$  is odd, multiply it by 3 and add 1.

Example -

$n = 15 \rightarrow 46 \rightarrow 23 \rightarrow 70 \rightarrow 35 \rightarrow 106$

$4 \leftarrow 8 \leftarrow 16 \leftarrow 5 \leftarrow 10 \leftarrow 20 \leftarrow 40 \leftarrow 80 \leftarrow 160$

$2 \rightarrow 1$

$57 \xrightarrow{26 \text{ steps}} 1$

$25 \xrightarrow{20 \text{ steps}} 1$

$37 \xrightarrow{22 \text{ steps}}$

$157 \xrightarrow{7} 1$

$7 \xrightarrow{16 \text{ steps}} 1$