## Output devices/channels

|  |  |  |  |
| --- | --- | --- | --- |
| **Movement (device/channel 1)** | | | http://www.livescience.com/images/i/000/060/089/original/PF2411_turtle_h.jpg?interpolation=lanczos-none&fit=around%7C300:200&crop=300:200;*,* |
| If Accumulator value is 0  0 = **move forward** | Send the value in **Accumulator** to Output device/channel 1.  OUT 1 |  | |
| If Accumulator value is 1  1 = **move backward** | Send the value in **Accumulator** to Output device/channel 1.  OUT 1 |  | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Steering (device/channel 2)** | | | http://www.turtleturns.com/wp-content/uploads/2012/03/turtle-turned.jpg |
| If Accumulator value is 0  0 = **face north** | Send the value in **Accumulator** to Output device/channel 2.  OUT 2 |  | |
| If Accumulator value is 2  2 = **face east** | Send the value in **Accumulator** to Output device/channel 2.  OUT 2 |  | |
| If Accumulator value is 4  4 = **face south** | Send the value in **Accumulator** to Output device/channel 2.  OUT 2 |  | |
| If Accumulator value is 6  6 = **face west** | Send the value in **Accumulator** to Output device/channel 2.  OUT 2 |  | |

# Commands Battle Tank understands (Instruction set)

## Data labels (variables)

These are like variables in Scratch / Python. Using them will make your programs more understandable!

The line below creates a data label (variable) called Forward and stores 0 in it (ready for moving forward!).

Forward DAT 0

This line creates another data label called Backward and stores 1 in it (again, ready for moving backward).

Backward DAT 1

Q) How would you create **data labels** for the **4 steering directions**?

|  |  |
| --- | --- |
| **Steering direction** | **Data label command** |
| North |  |
| East |  |
| South |  |
| West |  |

## Instructions

|  |  |
| --- | --- |
| LDA Forward | LDA ???? 🡪 load the value (data label) into the **Accumulator**. |
| OUT 1 | OUT ? 🡪 output the value in the Accumulator to the specified output device/channel. |
| HLT | HLT 🡪 stops the program |

## First program

|  |  |
| --- | --- |
| LDA Forward  OUT 1  HLT  Forward DAT 0 | Load the value stored in data label Forward into Accumulator  Output value in Accumulator to output device 1 (movement). Move forward 1 cell.  Stop the program  Create a data label called Forward and store the value 0 in it |

Q) Explain what these instructions do

|  |  |
| --- | --- |
| LDA Backward  OUT 1  LDA Forward  OUT 1  HLT  Forward DAT 0  Backward DAT 1 |  |