

## Turing Machine Exercise

- 1) Why are Turing machines important in computing?

Because they help us understand that algorithms are computable.

- 2) What is a Universal Turing Machine?

A Universal Turing machine can simulate the behaviour of any Turing machine. The instructions of the Turing machine are stored on the tape.

- 3) Why is a Turing machine considered to be an interpreter?

A Turing machine reads one instruction at a time

- 4) Why is a Turing machine more powerful than a real computer?

A Turing machine has infinite memory (tape length)

- 5) What is the relation between an algorithm and a Turing machine?

If an algorithm exists that can solve a problem, then a Turing machine can be created to solve the problem.

- 6) Why can a Turing machine not solve the Halting problem?

The Halting problem itself cannot be solved.

- 7) What are the limitations of a Turing Machine?

Can only solve a single problem for which it was designed, because the instructions are not stored in memory.