

# 45 Lecture - CS402

## Important Subjective

1. **What is the purpose of a Turing machine?**

Answer: The purpose of a Turing machine is to simulate any computer algorithm given enough time and memory.

**What is the tape in a Turing machine?**

Answer: The tape is a linear sequence of cells that can hold symbols. It can be infinite in length and is used to store input data and intermediate results.

**What is the read/write head in a Turing machine?**

Answer: The read/write head is a device that can move along the tape and read or write symbols.

**What is the finite control in a Turing machine?**

Answer: The finite control is a set of rules that determines the next action based on the current state and the symbol being read.

**Can a Turing machine solve any problem that can be solved algorithmically?**

Answer: Yes, a Turing machine can solve any problem that can be solved algorithmically.

**Are there any problems that cannot be solved by a Turing machine?**

Answer: Yes, there are problems that cannot be solved by a Turing machine. An example is the halting problem.

**What is the significance of the halting problem in the context of Turing machines?**

Answer: The halting problem demonstrates the limitations of computing machines and shows that there are some problems that cannot be solved algorithmically.

**What is the Church-Turing thesis?**

Answer: The Church-Turing thesis states that any problem that can be solved algorithmically can be solved by a Turing machine.

**What is the difference between a deterministic and non-deterministic Turing machine?**

Answer: A deterministic Turing machine always produces the same output for a given input, while a non-deterministic Turing machine may have multiple possible outputs for a given input.

**What is the time complexity of a Turing machine?**

Answer: The time complexity of a Turing machine is the number of steps it takes to solve a problem, and it is used to analyze the efficiency of algorithms.