Introduction to problem solving

Introduction

- People make decisions every day to solve problems that affect their lives.
- The problems may be unimportant or important
- If a bad decision is made, time and resources are wasted, so it's important that people know how to make decisions well.





Steps in problem solving

- 1. Identify the problem
- 2. Understand the problem
- 3. Identify alternative ways to solve the problem
- 4. Select the best way to solve the problem from the list of alternative solutions
- 5. List instructions that enable you to solve the problem using the selected solution
- 6. Evaluate the solution

- 1. Identify the problem
 - make sure you identify the problem before you start solving the problem
- 2. Understand the problem
 - make sure you identify the problem before you start solving the problem
- 3. Identify alternative ways to solve the problem
 - the list should be as complete as possible
- 4. Select the best way to solve the problem from the list of alternative solutions
 - you need to identify and evaluate the pros and cons of each possible solution before selecting the best one

- 5. List instructions that enable you to solve the problem using the selected solution
 - this step-by-step instructions must fall within the knowledge base set up in step 2
- 6. Evaluate the solution
 - check its result to see if it is correct, and to see if it satisfies the needs of the person with the problem

Exercise

■ Try to solve the problem of what to do on this Saturday evening.

abhishek.verma@vitbhopal.ac.in

Types of Problems

- Problems do not always have straightforward solutions
- Some problems can be solved with a series of actions. This solutions are called **algorithmic solutions**. Eg., Baking cake, Balancing check book etc.
- once one has chosen the best among several methods, the solution can be reached by completing the actions in steps. These steps are called the algorithm.
- Solutions that cannot be reached through a direct set of steps are called heuristic solutions. Eg., how to buy the best stock or whether to expand the company
- **heuristic** solutions require reasoning built on knowledge and experience, and a process of trial and error.

Problem Solving with Computers

- Computer are built to dealt with algorithmic solutions
- The field of computers that deals with heuristic types of problems is called artificial intelligence.
- Artificial intelligence enables a computer to do things like build its own knowledge bank and speak in a human language.

Difficulty with problem solving

- Some have not been taught how to solve problems.
- Some are afraid to make a decision for fear it will be the wrong one
- Often, when people go through the problem solving process, they complete one or more of the steps inadequately
- When solving problems on the computer, one of the most difficult tasks for the problem solver is writing the instructions.