Knowledge-based systems

data, information, knowledge

purpose

    ill-structured problems: when the problem is impossible or
difficult to formalize

    an efficient algorithm in unknown, only rules

    input data are incomplete, inconsistent and/or **uncertain**

    knowledge may change

    and an intelligent solution is expected

examples

planning, diagnostics, robotics, games ...

how to solve it:

separate knowledge and computation

Knowledge-based systems

Knowledge-based system

knowledge base – knowledge for solving the problem, or class of problems

inference engine – reasoning

database – facts about the particular problem solved

user interface

explanation mechanism

Building a knowledge-based system

Design and implementation

    choose a knowledge representation

    and a suitable inference engine (IE)

    build an interface between IE and the knowledge base

    implement the inference engine

    and the suporting modules

Put general knowledge into the knowledge base

Build the application

Building a knowledge-based system: An example

choose a knowledge representation

prolog clauses; rules

and a suitable inference engine (IE)

Prolog inference engine; metainterpreter

build an interface between IE and the knowledge base

listing, trace; to implement

implement the inference engine

and the suporting modules

Put general knowledge into the knowledge base

Build the application