§ 9.2 n-ary relations and their applications

1. Introduction

(1) n-ary relations

Definition 1 (page 583)

Let $A_1, A_2, \ldots, A_n$ be sets . An n-ary relation on these sets is a subset of $A_1 \times A_2 \times \ldots \times A_n$.

The sets $A_1, A_2, \ldots, A_n$ are called the domains of the relation.

n is called its degree.

(2) Example 1

Let R be the relation on $N \times N \times N$ consisting of triples (a,b,c) where a,b and c are integers with $a<b<c$.

The $(1,2,3) \in R$, but (2,4,3) not in R.

(3) Example 4 (page 584)

Let R be the relation consisting of 5-tuples (A,N,S,D,T) representing airplane flights, where A is the airline, N is the flight number, S is the starting point, D is the destination, and T is the departure time.

For instance, if Nadir Express Airlines has flight 963 from Newark to Bangor at 15:00, then (Nadir, 963, Newark, Bangor, 15:00) belongs to R.