



Figure 10. Relation matrix for (a) list P of popes, (b) list of Roman emperors; ▲, duplicates.

immediately that the interval 1700–1950 A.D. contains no duplicates, whereas the interval 1600–1700 A.D. is comparatively weakly related to certain epochs after 100 A.D., the only stronger relation is to the interval 1180–1260 A.D.

The duplicate system list is given Table 1 in accordance with Fig. 10(a). The arrowheads denote relations with the (key) time interval which is first in each line, whereas the dotted ones denote comparatively weak relations. The interval time limits are accurate up to a century. The right-hand column contains the generated shifts.

The list of Roman emperors' names is now considered. It is constructed from the names of Roman emperors (after the separation of the western Roman Empire) from Romulus (753 B.C.) to Leopold I (approximately 1700 A.D.). The complete list (including different versions) was combined by summing the lists from Bickerman (1968), Blair (1882) and Gregorovius (1900–1909). If several names of one emperor are known, then they all are written out one by one. The ordering is made relative to the rule's middle years, the list contains no separation signs between the names of consecutive emperors, its length is 555, the number of different names 193, and the maximal name multiplicity 40 (see the essential relation matrix in Fig. 10(b)). Similarly to the previous item, we also list the distinguished duplicate systems and generated shifts.

Table 1
Statistical duplicate system for the popes' list

No.	Duplicate system (century)	Shifts (years)
1	II ← XV–XVI	1300–1400
2	II, III ← XII	1000
3	III, IV ← XI; ← XVI	700, 1200
4	VI, VII ← X	280–330
5	VI ₂ , VII ← XIII ₂ ; ← XIV, XV ₁	660, 760
6	XI ← XIII; ← XVII ₁	300, 600
7	XII, XIII ← XVII ₁	500
8	XIII ← XIV	170
9	XIV ← XVII ₁	330

Roman numeral indicates a century; subscript 1 and 2 denotes first or second half of century, respectively.