

The second issue itself forces us to look for languages that allow succinct representations of valuations. We will call them bidding languages. to be used in practice

Here we face expressiveness v.s. simplicity issues.  
 express succinctly as many naturally occurring simple both for humans to express and for programs to work

E.g. we can use combination of atomic bids with OR & XOR  
 atomic bid is an offer of  $P$  for bundle  $S$  of items of any  $T \supseteq S$  and  $(S, P)$  val. for other

Then we have  $\{(\{a, b\}, 3) \text{ XOR } (\{c, d\}, 5)\}$  then  $V(\{a, c\}) = 0, V(\{a, b, c, d\}) = 5$   
 e.g.  $\{(\{a, b\}, 3) \text{ OR } (\{c, d\}, 5)\}$   $V(\{a, c\}) = 0, V(\{a, b, c, d\}) = 8$   
~~the~~  $(\{a, b\}, 3) \text{ OR } (\{a, c\}, 5)$   $V(\{a, b, c\}) = 5$  since we can satisfy only one.

This is a natural approach see more details of bidding languages in the book AGT, sec 11.4. This is an active research e.g. for Google