

Answer to the quiz:

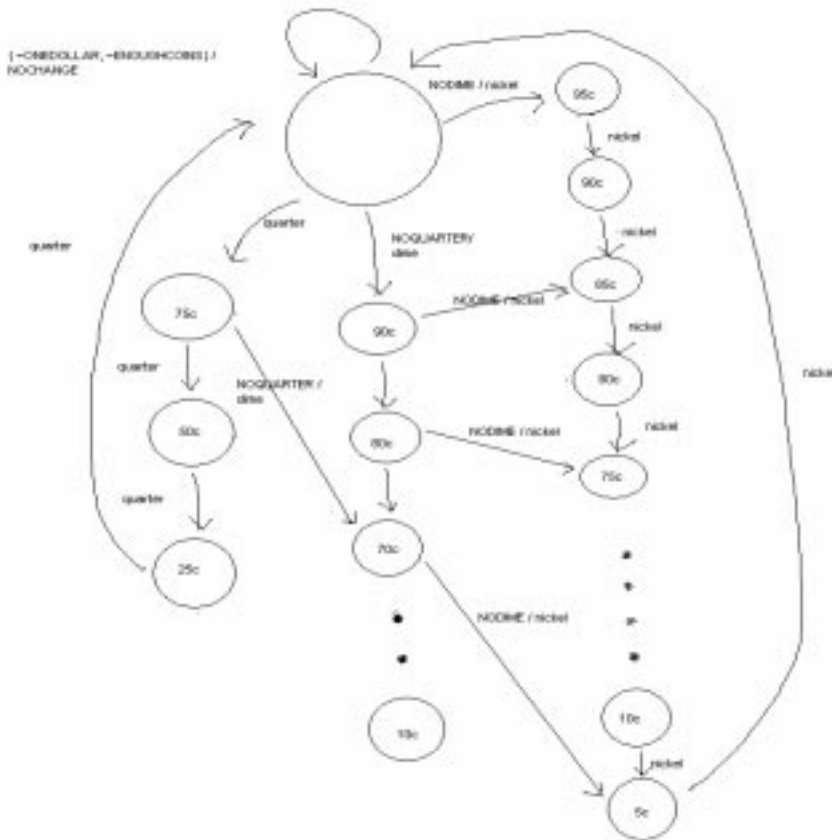
No definite answer. Depends on one's definition, it can be either a sequential or a combinational system, although it seems that a sequential system WITH MEMORY makes more sense, at least simpler to design.

Sequential machine:

Assumption:

1. priority: bigger coins are preferred rather than smaller coins. That means even though we have different sets of possible combination of coins output, setting priority gives only one possible output. For instance, given all coins are more than enough, 4 quarters will be given. If all quarters are used up, 3 quarters, 2 dimes and one nickel will be given, etc.
2. If all options are out, display "no change" message, and the bill will be ejected.
3. Only one dollar bill is accepted. One bill at a time.
4. This means input signals include: ONEDOLLAR, ENOUGHCOIN
Output signals include: NOCHANGE, NOQUARTER, NONICKEL, NODIME, quarter, dime, nickel

Here is the state diagram:



Cominbation can be correct, but it makes less sense – we can just assume that the machine allows the user to choose which combination of coins he/she wants. Then the logic will be simple: the machine will output the combination chosen by the user. No truth table is needed! But do you think this kind of machine exists?

If the machine were made to make decision based on what combination of coins to be output, it needs to know how many coins, and what kind of coins, are given to the user at any point of the process. In that case this machine will be a sequential system, since it has MEMORY.