

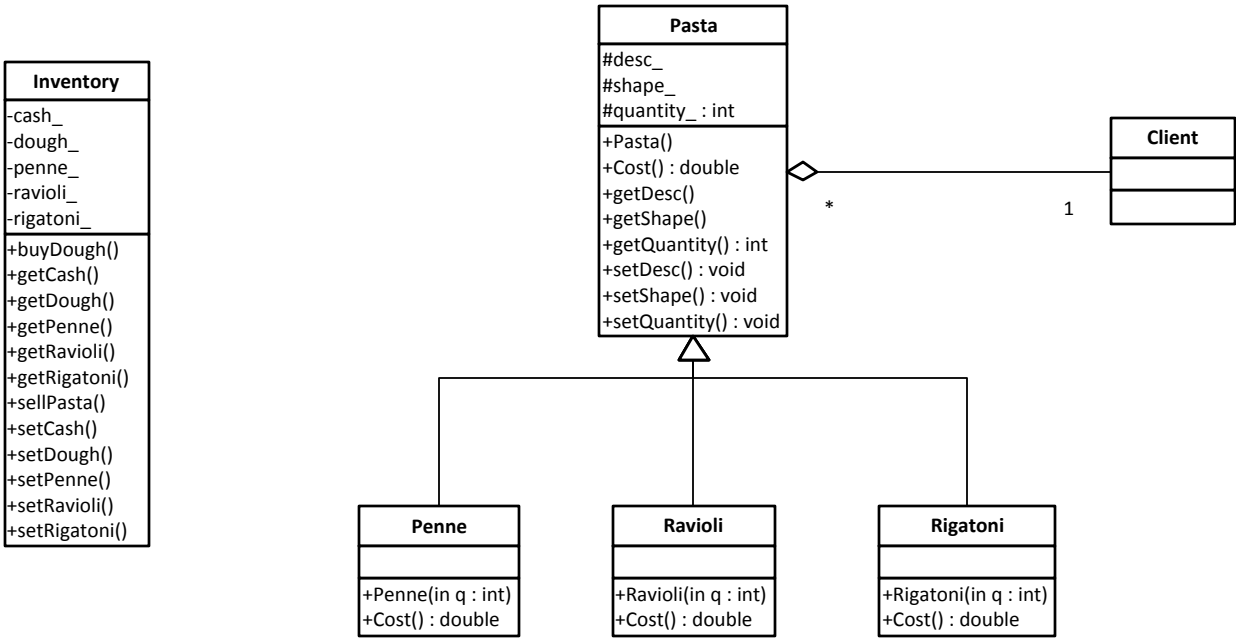
Question 3:

a) The class diagram models the programing of a pasta factory which uses electronic pasta maker controlled via a computer interface. A pasta maker will produce different types of pasta, depending what kind of past the user inputs into the machine's system. All pasta should have certain properties in common, so that they will work with the pasta maker. The Pasta object entry has a description, a shape, a quantity (how much to produce), a money cost determined via a per box ratio ( for example a box of Penne costs 2 dollars) and a dough cost. Dough is the material all pasta is made with and each kind of pasta has a dough cost that should be normally proportional to the selling price of that particular pasta, as when a price for a product is determined the things that are considered are the prime materials used, the cost of the process and the profit margin. For the simplicity of the moodel we assumed that only the prime material is considered and as a result of the fact that all pasta is made from the same prime material - according to our model- each price is directly proportional to the cost of the dough for that particular pasta so that it also includes a profit margin.

The inventory object keeps track of the amount of money available as well as the amount of prime material(dough) as pasta cannot be produced without it. It allows the user to purchase dough as well as allowing him to sell the pasta that he has produced using the dough. As with a real business the factory first needs an initial sum of money which can be multiplied by purchasing dough, producing and selling pasta. The class allows the programmer set the starting amount of money and dough.

The user inputs the amount of pasta and the kind of pasta to produce and the machine produces the said amount of pasta and it updates the factory inventory records of the newly produced amount of pasta in storage if the inventory contains enough dough to produce that said amount of pasta. Also the inventory allows the user to sell the pasta in exchange for money- money which can be used to purchase more dough, produce more pasta and thus gain profit.

The inventory system keeps track of how much pasta is stored, by type of pasta.



*To solve this problem, we will use the Factory design pattern*

b)

