



امتحانات الدورة الأولى للفصل الثاني
من العام الجامعي 2021 - 2022

Object-oriented programming	المادة:	إجازة	المرحلة:
ساعة ونصف	المدة:	الأولى	السنة المهيجية:
د. جواد مكي	الأستاذ:	Data Science	الاختصاص:
(100)	العلامة من:		

Question # 1 (30 pts)

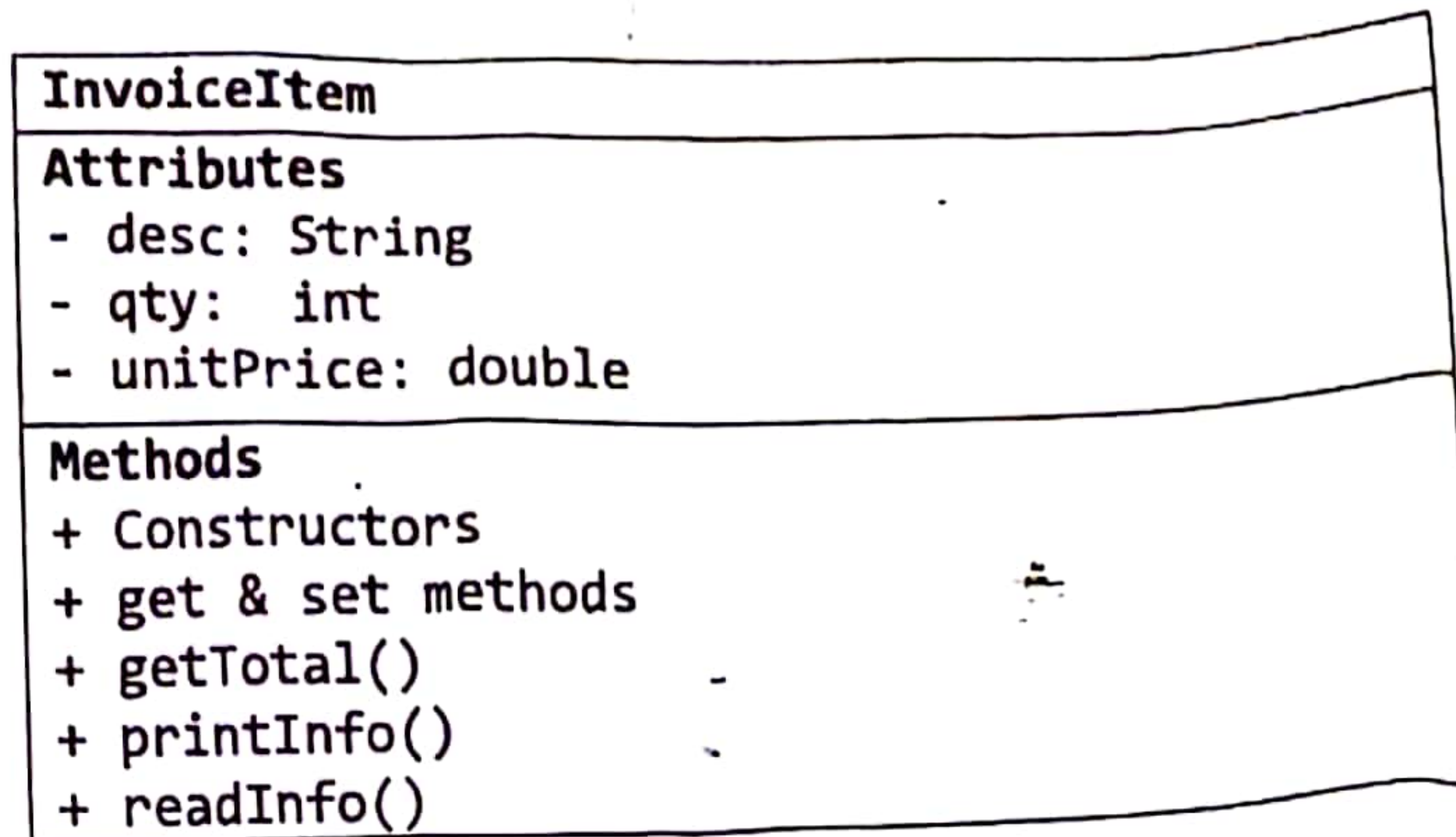
Write a Java program called SumProductMinMax that prompts user for three integers. The program shall read the inputs as `int` using the class `Scanner`; validate that all the three integers are positive otherwise keep prompt user again for new inputs until you have valid values. Compute the sum, product, minimum and maximum of the three integers; and print the results. For examples,

```
Enter 1st integer: 10
Enter 2nd integer: 0
Enter 3rd integer: -5
Warning! wrong values, all numbers must be positive
```

```
Enter 1st integer: 8
Enter 2nd integer: 2
Enter 3rd integer: 9
The sum is: 19
The product is: 144
The min is: 2
The max is: 9
```

Question # 2 (70 pts)

Consider the following class diagram called InvoiceItem, which models an item of an invoice, with description, quantity and unit price.



- the symbol '-' means 'private'
- the symbol '+' means 'public'

Below are more descriptions about the class:

- Constructors: Define the class constructors to accept and initialize instance data. Define two constructors
 1. the default constructor (no-argument)
 2. and the parameterized constructor (with all arguments).
- get & set methods for all attributes
- getTotal(): a method that calculates the total price (unitPrice x qty) and returns it as a double
- readInfo(): a void method that reads the needed item data entered by the user to the class attributes using the Class Scanner
- printInfo(): a void method to print a description of the InvoiceItem in this format
InvoiceItem [desc=Mug | qty=4 | unitPrice=2.50 | TotalPrice =10.00]

a) Write the class InvoiceItem.

b) Create a driver class called Test whose main method should perform the following tasks:

1) Create 2 InvoiceItem objects (item1 & item2) as the following

a) desc: Mug
qty: 4
unitPrice: 2.50

b) desc: marker
qty: 2
unitPrice: 3.20

2) Create a new InvoiceItem object (item3) and read the needed data of it using readInfo().

3) Change the unitPrice of the first object item1 from "2.50" to "2.80" and print it.

4) Calculate and print the total prices of all the objects (item1, item2, item3)

5) Print a full description of all the objects (item1, item2, item3)