

PFI Re-exam

23 August 2019

Answers

Question 1

- a) True
- b) False
- c) True
- d) False
- e) True
- f) False
- g) True
- h) True
- i) True
- j) False

[1 mark for each correct part]

Question 2

- a) Overload [2 marks]
- b)

- a(int): float	No, cannot reduce visibility
+ a(int): double	No, incompatible return type
+ a(float): int	Yes
- a(int, int): float	Yes

[4 marks]

- c)

- a(int): int	No, duplicate signature
+ a(float, float): double	Yes
- a(int, double): int	Yes
+ a(): int	Yes

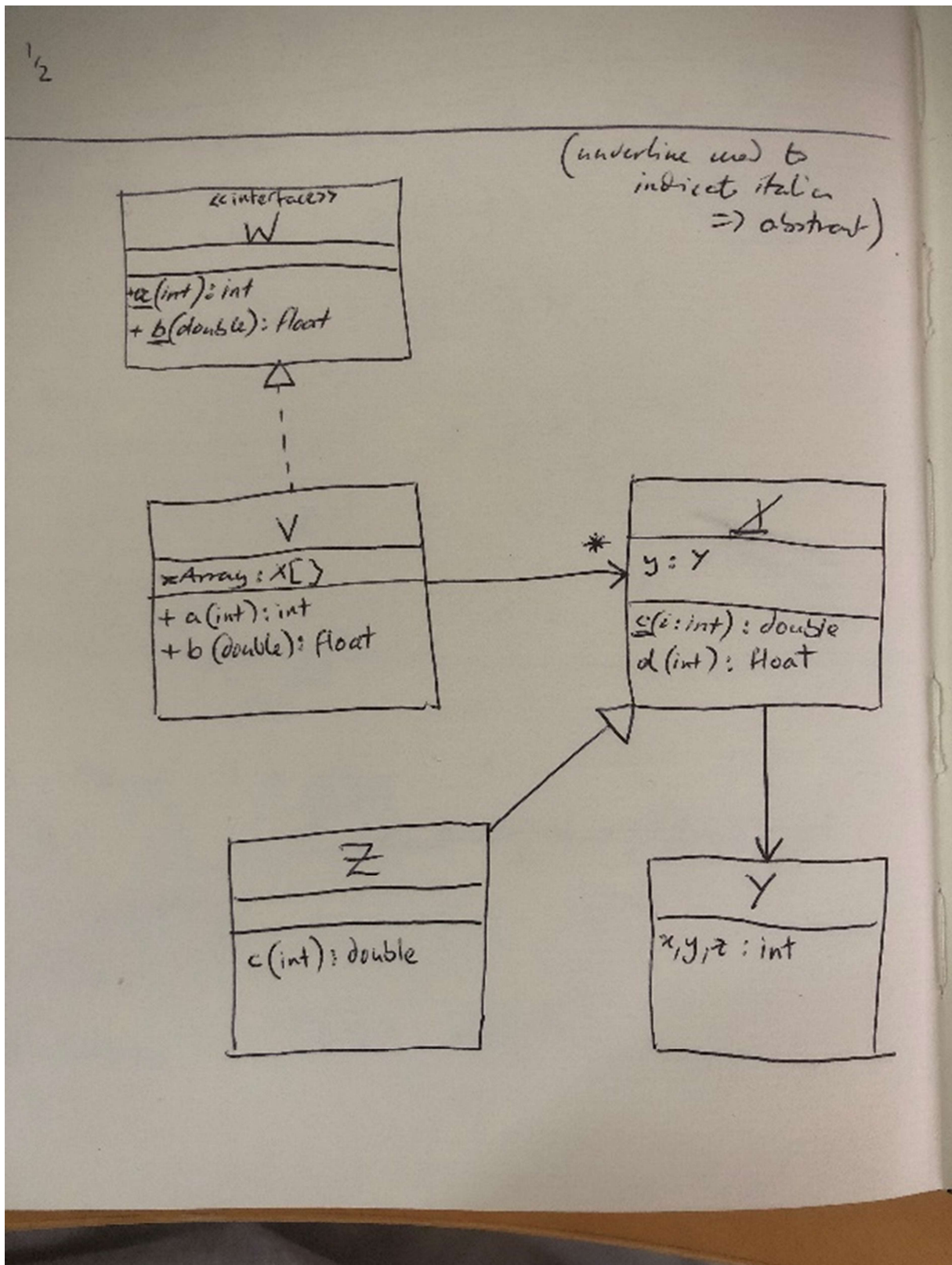
[4 marks]

Question 3

```
0 1 1 2
0.5 1.0 1.5 2.0
1.0 2.0
```

[10 marks]

Question 4



[10 marks]

Question 5

a) 00 [3 marks]

- b) Won't run because there is no noargs constructor. Either define a no-args constructor, in which case the output will be 0 2; or add a numerical argument, x, to the constructor call in line 6, in which case the output is
x 2
[3 marks]
- c) 1 2
1 2 3
[4 marks]

Question 6

- a) Line 4 generates an error because it is attempting to access a non-static variable, c, from a static context. [3 marks]
- b) Line 4 generates an error because it is attempting to modify the value of d which is final. [3 marks]
- c) Lines 12 generates an error because it is attempting to instantiate an abstract class. [4 marks]

Question 7

Two sequences of integers, starting with 6 ending either with "10 Red thread won!" or "0 Green thread won!". Each number must be one different from the previous one.

6 7 6 7 6 5 6 5 4 3 2 3 2 1 0 Green thread won!

6 5 6 7 8 7 8 7 6 7 6 7 6 7 6 5 6 5 4 5 4 3 2 3 4 3 4 3 4 5 4 3 4 5 6 5 4 5 4 5 6
5 4 5 6 5 6 5 6 5 6 7 6 7 8 7 8 7 8 7 8 9 8 7 8 7 8 9 8 9 10 Red thread won!

6 5 6 7 6 5 6 5 6 7 6 7 6 7 8 9 8 7 8 9 8 9 8 9 10 Red thread won!

6 5 6 5 6 5 6 5 6 5 4 5 6 5 4 5 4 5 4 5 6 5 6 7 6 7 6 7 8 9 8 9 8 9 10 Red thread won!

6 7 6 7 6 7 6 7 6 5 6 5 6 7 8 7 8 7 8 7 6 7 8 7 8 7 8 7 8 7 6 5 6 5 4 5 4 5 6 5 4
5 4 3 4 5 4 3 4 5 4 5 4 3 4 5 4 5 4 3 4 3 2 3 2 3 2 3 2 1 2 3 2 1 0 Green thread won!

[10 marks for two correct sequences]

Question 8

- a) Question8Server prints the following to its console:
This line has 28 characters.
Question8Client prints the following to its console:
28
[4 marks]

b)

```
java.net.ConnectException: Connection refused: connect
    at java.base/java.net.PlainSocketImpl.connect0(Native Method)
    at java.base/java.net.PlainSocketImpl.socketConnect(PlainSocketImpl.java:101)
    at java.base/java.net.AbstractPlainSocketImpl.doConnect(AbstractPlainSocketImpl.java:399)
    at java.base/java.net.AbstractPlainSocketImpl.connectToAddress(AbstractPlainSocketImpl.java:242)
    at java.base/java.net.AbstractPlainSocketImpl.connect(AbstractPlainSocketImpl.java:224)
    at java.base/java.net.SocksSocketImpl.connect(SocksSocketImpl.java:403)
    at java.base/java.net.Socket.connect(Socket.java:591)
    at java.base/java.net.Socket.connect(Socket.java:540)
    at java.base/java.net.Socket.<init>(Socket.java:436)
    at java.base/java.net.Socket.<init>(Socket.java:213)
    at com.chromamorph.pfiReExam2019.Question8Client.main(Question8Client.java:13)
```

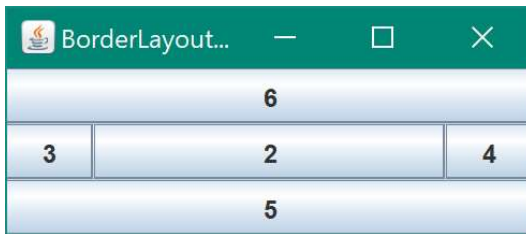
An exception is thrown because the client program attempts to connect to a server at a port on which nothing is running. [2 marks]

c) 40000 [2 marks]

d) Question8Server continues to run until it is manually stopped. It blocks at line 18 and never advances beyond this. [2 marks]

Question 9

a)



[4 marks]

b) It causes the program to terminate when the close button is pressed. [2 marks]

c) The event dispatch thread. [2 marks]

d) It finalises the dimensions and positions of all the elements in the GUI in accordance with the layout manager. [2 marks]

Question 10

a) onPause, onResume, onCreate. [2 marks]

b) Streaming sensor because the sensor delay is set to normal (SensorManager.SENSOR_DELAY_NORMAL). [2 marks]

c) It unregisters the light sensor so that it stops sending signals when the Activity is in the paused state. This saves resources and also makes sure that resources are freed up if the Activity is killed while it is in the paused state. [3 marks]

d) this SensorActivity object serves as the SensorEventListener. the onSensorChanged callback runs when an sensor event is emitted. If the accuracy of the sensor is changed, then the onAccuracyChanged callback is run. [3 marks]