

**University of Cape Town**  
**Department of Computer Science**

**Computer Science CSC1010H**

**Class Test 3**

**Wednesday, 1 October 2014**

---

Marks: 35	• Approximate marks per question are shown in brackets
Time: 40 minutes	• The use of calculators is permitted

---

	Surname	Initials
NAME:	<input type="text"/>	

STUDENT NO:	<input type="text"/>	COURSE CODE:	<input type="text" value="CSC"/>
-------------	----------------------	--------------	----------------------------------

This paper consists of 5 questions and 5 pages (including this cover page).

Mark Allocation							
Question	Marks	Internal	External	Question	Marks	Internal	External
1	3			5	5		
2	12						
3	5						
4	10						
Total				Total			
Grand Total							
						Final Mark	
Internal Examiner:				External Examiner:			

**Question 1. [3 marks]**

- a) Which Python keyword is used to specify a code block which should be executed in an exception, whether an exception occurs or not. [1]

finally

- b) Which Python exception is generated when trying to index a sequence out of range. [1]

IndexError

- c) Write a line of code which goes at the top of the code block which handles the exception mentioned in b) and putting that exception in a variable *ie*. [1]

except IndexError as ie

**Question 2. [12 marks]**

- a) Considering the sorting algorithms Selection Sort and Merge Sort:

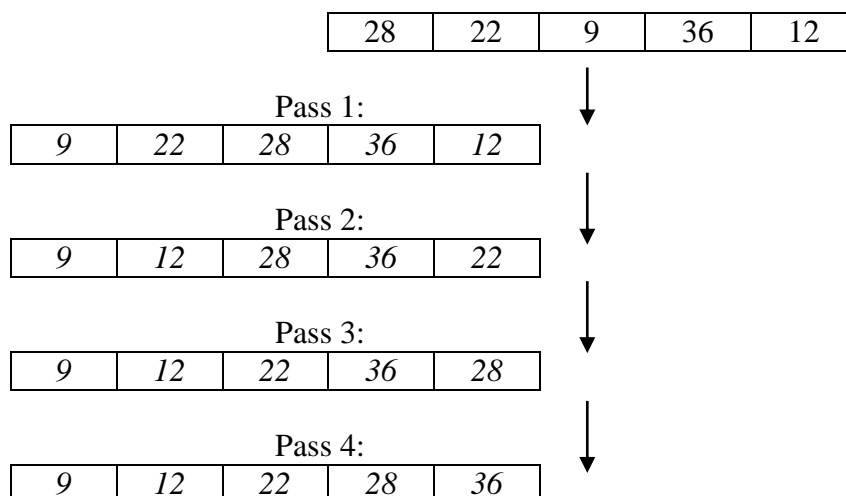
- i. Which algorithm is more efficient? [1]

Merge

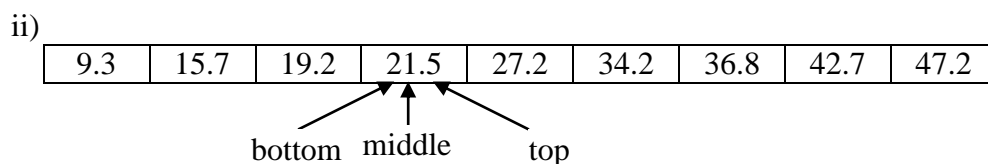
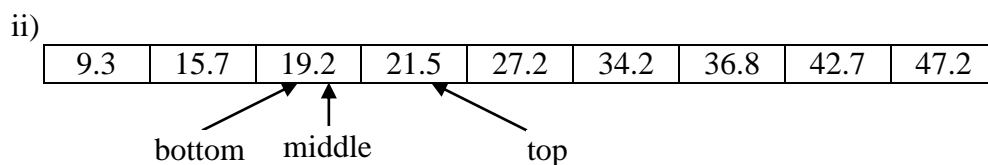
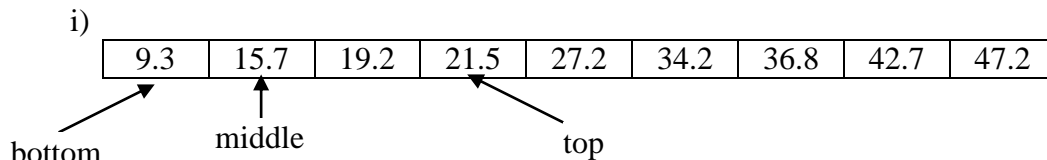
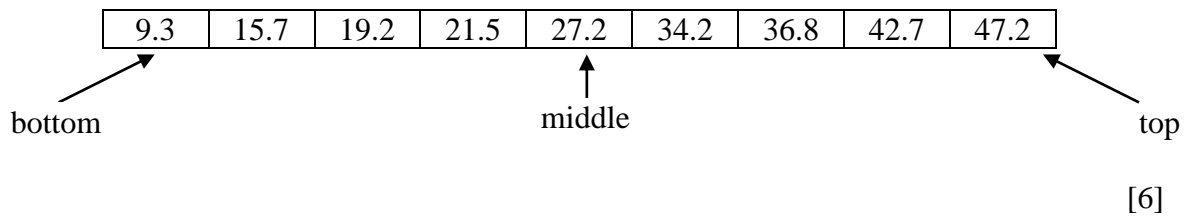
- ii. Which is algorithm is simpler to code? [1]

Selection

- b) Show how the following array changes after each pass of an ascending-order selection sort. [4]



c) Use Binary Search to find the value 21.5 in the following sorted array. Show how the indices *bottom*, *middle* and *top* will change for each step of the Binary Search (do this by drawing the arrows with labels, as shown above).



**Question 3. [5 marks]**

a) Fill in the two missing elements from the process used for the Scientific Method. [2]

---



---

b) Name two ways to present data from an experiment in an organized and visual way. [2]

Table

---

Graph

---

c) What is the Python Epoch reference date? [1]

1 January 1970

---

**Question 4.** [10 marks]

- a) Create a class called Triangle which has object variables for sides a, b and c. The Triangle class should have a constructor and a string conversion method. It should also have a method which returns the perimeter of the triangle. [7]

---

```
class Triangle: #1

    def __init__(self,a,b,c): #1
        self.side_a = a
        self.side_b = b    #1 for all assignments
        self.side_c = c

    def __str__(self): #1
        return str(self.side_a) + "," + str(self.side_b) + "," + str(self.side_c) #1

    def perimeter(self): #1
        return self.side_a + self.side_b + self.side_c #1
```

---

- b) Using the class defined above, write a short code fragment which creates a triangle object with sides 3, 4 and 5, prints out the object perimeter and prints out the object itself. [3]

---

```
tri = Triangle(3,4,5) #1
print(tri.perimeter()) #1
print(tri) #1
```

---

**Question 5.** [5 marks]

- a) Consider the following written question, and do a task analysis on the question.

*Considering Python loops, contrast for loops and while loops, specifically looking at keywords and their use, i.e. when to use which loop.* [3]

---

Broad topic: Loops #1

Specific details: for loops, while loops, keywords, use #1

Question/Instruction word: contrast #1

---

---

---

- b) In the formal writing process, indicate why referencing is important? [1]

- To acknowledge the work of others
- To share resources
- To place authors in a field of knowledge
- To show where we got our information from so that it can be verified
- To support our claims with evidence

(any one)

---

Indicate if the following statements are true or false:

- c) In academic writing, personal pronouns like “I”, “me” and “we” are frequently used. [1]

False

---