Candidate 1

ENTER NUMBER OF QUESTION | DO NOT WRITE IN THIS MARGIN

1) First run:

~~Sycamore = Oak (FALSE)~~

~~Sycamore > Oak (TRUE)~~

~~Second run:~~

1. Sycamore > Oak
2. Sycamore < Willow
3. Sycamore = Sycamore

2a) 519

b)

	Node	Contents	Pointer
blue	523	Purple	514
green	517	green	523
purple	519	blue	517
red	514	red	null

3a) puzzle = [[0 for _ in range(9)] for _ in range(9)]

b) puzzle[3][4] = 9

4a) ~~Erying would attempt to use the system to book the appointment for Marjorie Wheeler's dog Whisker~~ the

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4a) Usability testing would be performed with the persona of Greig. The developers would take notes and observe how the persona interacts with and navigates the system to perform the specific task, in this case booking an appointment for Marketa Jabour's dog at 10am, 23 June 2024. Having observed how easily the persona found the experience the developers can make informed decisions about the ease of use. The persona will describe what he is doing and thinking aloud to help the developer understand his experience.

b) Perfective because a new feature is being added

5a) Triangle, Rectangle and Circle all override the calcArea method, this means that these classes have a specific implementation of calcArea that is different to the super class Shape. This is an example of polymorphism. This is needed because each shape's area must be calculated differently

ENTER NUMBER OF QUESTION		DO NOT WRITE IN THIS MARGIN
	b)(i) This statement instantiates a new instance of the Rectangle class. It sets the fill colour to "White", line colour to "black", length to 20 and breadth to 16. area is initially set to 0 in the constructor	
	(ii) The area is 0 The area is 320	
	c) (i) The fillColour property is set to "red" by using the setFillColour method from the Shape super-class that Rectangle inherits from. This makes the door red	
	ii) The program ~~system~~ printing does not know that list[8] is an instance of wheel since polymorphism has been used to create an array of Shape. This causes an error to be generated since the getCircumference method exists on Wheel and not Shape	

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5d) (i) While Swapped == True:

(ii) if array[i] < array[i+1]:

(iii) temp = array[i]

~~array[i+1] = array[i]~~

~~array[i+1] = temp~~

array[i] = array[i+1]

array[i+1] = temp

6a) Open connection to database (from database Connection)

Set data to result of querying all mammal data

Close database connection

Start loop for i = 0 to i = length of data - 1:

Set animal to data[i]

Set animalList[i] to new Animal(

mammal from animal data,

numberRemain from animal data,

readingNumber from animal data,

readingDate from animal data

)

End for Loop

ENTER NUMBER OF QUESTION		DO NOT WRITE IN THIS MARGIN
	b) (i)	
	3.3.5 Set value to list[n]	
	3.3.6 Set index to n	
	3.3.7 While index > 0 and list[index - 1] < value, reading Number; • reading Number	
	3.3.8 Set list[index] to list[index - 1]	
	3.3.9 Set index to index - 1	
	3.3.10 End conditional loop	
	3.3.11 Set list[index] to value	
	ii) ~~For i = 0 to length of temp - 1:~~ ~~For n = 0 to length of animalList - 1:~~ ~~DECLARE previous As initially null~~ ~~for n = 0 to length of animalList - 1:~~	
	for i = length of animalList - 1 down to 0:	
	set newPos to i + length of temp	
	if newPos > length of animalList - 1:	
	Continue loop at next iteration	
	End if	
	Set animalList[newPos] to animalList[i]	
	Set animalList[i] to null	
	End for loop	

ENTER NUMBER OF QUESTION		DO NOT WRITE IN THIS MARGIN
	1) (iii) ~~DECLARE birdReadings AS [illegible]~~	
	~~for i = 0 to length of animalList:~~	
	~~for i = 0 to length of animalList -1:~~	
	DEFINE ~~[illegible]~~ checkedAnimals AS ~~[illegible]~~	
	array of Strings	
	for i = 0 to length of animalList -1:	
	~~IF animalList[i]. mammal~~ SET checked TO False	
	For j = 0 to length of checkedAnimals -1 :	
	IF checkedAnimal[j] = animalList[i]. mammal:	
	~~CONTINUE to next loop iteration~~	
	~~END IF~~ SET checked TO True	
	End IF	
	END FOR	
	IF checked IS False:	
	SET index to i	
	SET found TO False	
	WHILE found IS False	
	SET index TO index+1	
	IF animalList [index]. mammal~~[illegible]~~	
	IS animalList[i] mammal:	
	SET (percentage to animalList[i]. numberRemaining	
	/ animalList[index]. numberRepairs)	
	* 100	

ENTER NUMBER OF QUESTION		DO NOT WRITE IN THIS MARGIN
	IF percentage <= .95:	
	DISPLAY animalList[i].name +	
	"is at risk of extinction with a decrease of"	
	+ 100 - percentage + "%"	
	END IF	
	END WHILE	
	END IF	
	Append animalList[i].name TO	
	deadAnimals	
	END FOR LOOP	

Candidate 2

ENTER NUMBER OF QUESTION | DO NOT WRITE IN THIS MARGIN

1. The first mid point would be ~~position~~ index 3, "Oak". A comparison of the first letter would show 'Sycamore' is 'larger' than 'Oak'. Then Willow would be the midpoint and 'W' is larger than 'S', so sycamore would be the new midpoint and be found. (Oak < Sycamore, Willow > Sycamore) (Sycamore = Sycamore)

2.a) Head pointer would store the ~~address~~ memory of the next node, ~~and the first pointer to the first node is just HEAD~~ 519

2.b)

Node	Contents	Pointer
523	purple	517
517	green	519
519	blue	514
514	red	NULL

3.a)
```
grid = [[0] * 9 for i in range(9)]
```

3.b)
```
grid[3][4] = 9
```

4.a) This means the system should be tested on its usability, and Greig could provide feedback ~~while~~ while trying to make this appointment for developers to see how easy it was for him to use and also recieve user feedback from Greig.

ENTER NUMBER OF QUESTION		DO NOT WRITE IN THIS MARGIN
4.b)	Perfective:	
	Additional features ~~required~~ requested by the customer that were	
	not in the original system	
5.a)	Rectangle is a subclass of the superclass shape. Therefore it inherited the method calcArea(). Within the rectangle class it overwrote the calcArea() method so that the area of the rectangle could be worked out, and not the general message inherited from shape. This is a form of polymorphism and enables all the subclasses to have a method to work out the area for different shapes.	
b)(i)	Creates an object of the class 'Rectangle' called 'r1', which has a white fillcolour, black line colour, length 20, breadth 16. The area is initialised as 0 in the constructor method	
(ii)	The area is 0	
	The area is 320	
c)(i)	The object at index 4, t1, changes fillcolor to "red"	
(ii)	The list is an array of shapes, which does not contain the function getCircumference(), as that is only a method	

ENTER NUMBER OF QUESTION		DO NOT WRITE IN THIS MARGIN
	of the circle subclass, and ~~polymorphism made her~~ even though c2 is an circle, polymorphism means that it has become of the Shape class but was still allowed to be added to the array as a subclass of Shape.	
5.(d)	(i) while swapped = True and ~~[illegible]~~ n > 1 :	
	(ii) list[i].getArea() ~~[illegible]~~ list[i+1].getArea():	
	(iii) temp = list[i+1].~~getArea()~~ list[i+1] = list[i] list[i] = temp	
6.a)	OPEN CONNECTION TO DATABASE EXECUTE QUERY ("Select * from MammalData") ~~[illegible]~~ ~~[illegible]~~ store query results to 2Darray FROM X=0 TO <LENGTH OF RESULTS> ~~store 2Darray[X][0] into animalList[X].mammal~~ store each row of the 2Darray into corresponding animalList[X] fields END LOOP CLOSE DATABASE	

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6.b) (i)
```
set value = 0
set index = 0
loop from n=1 to length(list)-1
    value = temp[n]
    index = n
    while index >= 1 and (temp[index-1].readingNumber < value.readingNumber) do
        set temp[index] = temp[index-1]
        index = index - 1
    temp[index] = value
end loop
```

```
last = -1 / pos = 0
while last = -1 and pos < 1001 repeat
    if ky(animalList[pos].mammal) = 0
        set last = pos
    else do
        pos = pos + 1
    end if
end loop
```

NUMBER OF QUESTION | WRITE IN THIS MARGIN

6.b(ii)
```
H = len(temp)
from x = last to 0 repeat
    animalList[x+H] = animalList
end loop
from i=0 to 3 repeat
    set animalList[i] to null
end loop
```

ENTER NUMBER OF QUESTION | DO NOT WRITE IN THIS MARGIN

6. b)iii)

```
for names = list array of all mammal names
for i = 0 to length of names do
    set pos1 = -1
    set pos2 = -1
    set pos = 0
    while (pos1 = -1) or (pos2 = -1) do
        if animalList[pos].mammal = names[i] then
            if pos1 = -1 then
                pos1 = pos
            else
                pos2 = pos
            end if
        else
            pos = pos + 1
        end if
    end loop
    if ((animalList[pos2].numberRemaining - animalList[pos1].
    .numberRemaining) >= animalList[pos2] * 0.05) then
        display names[i]
        display percentage decrease
    end if
end loop
```

Candidate 3

ENTER NUMBER OF QUESTION		DO NOT WRITE IN THIS MARGIN
1)	if target = mid then	
2a	head = 523	
b	523 | purple | 517	
	517 | green | 519	
	519 | blue | 514	
	514 | red | Null	
~~8~~		
3		
9	Dim puzzle (8, 8) As Integer	
b	puzzle (~~3~~ 4, ~~4~~ 3) = 9	
4		
a	a member of the developer team would take on this persona and do the assigned task, inputs and results/outputs will be noted this test will show the ease of use of the program.	

ENTER NUMBER OF QUESTION		DO NOT WRITE IN THIS MARGIN
~~4~~		
4		
b	adaptive maintenance	
5		
a	This is an example of polymorfism the calcArea method in the Shape super class is overridden by the Triangle, Rectangle and Circle ~~clas~~ sub class this is because ~~calculating the area is~~ the formula for calculating the ~~area~~ of a shape is not the same for all shapes	
	~~b~~	
b		
i	an object is instanciated into the Rectangle class using a constructor method which ~~assigns~~ sets inital values to the instance variables	

ENTER NUMBER OF QUESTION		DO NOT WRITE IN THIS MARGIN
5		
b		
ii	The area is 0	
	The area is 320	
c		
i	the roof (of the house) will be	
	set to the colour red	
ii	.getCircumference() is not	
	a procedure	
	no procedure will be called	
	therefore resulting in an error	
d		
i	while swapped = true	
ii	if list(i) > list(i+1) then	
iii	temp = list(i)	
	list(i) = list(i+1)	
	list(i+1) = temp	

ENTER NUMBER OF QUESTION		DO NOT WRITE IN THIS MARGIN
6		
a	Get data from database	
	~~Set animalList(~~	
	For i = 0 to number of rows -1	
	~~set animalList(i) = datamammal~~	
	~~Set animalList(i) =~~	
	Set animalList(i).mammal to data mammal	
	Set animalList(i).numberRemaining to data remaining	
	Set animalList(i).readingNumber to data readingNum	
	Set animalList(i).readingDate to data readingdate	
	Next	
b		
i	~~If~~ temp = list(~~index~~)	
	index = n	
	if ~~list~~ index > 0 AndAlso ~~index~~ list(index-1	
	> temp) then	
	list(index) = list(index - 1)	
	index = index - 1	
	End If	
	~~End~~ list(index) = temp	

ENTER NUMBER OF QUESTION		DO NOT WRITE IN THIS MARGIN
6		
b		
ii	For index = 0 to rowsrequired	
	~~Temp(i) = animalList(i)~~	
	~~animalList(i) = animalList(i+1)~~	
	~~animalList(i+1) = Temp~~	
	~~For i = 0 to length of animalList~~	
	~~Temp2() = animalList(i)~~	
	~~animalList(i+1) = animalList(i)~~	
	~~next = temp2~~	
	nextT() = " "	
	For ~~every row~~ i = 0 to ~~every~~ number of rows	
	~~ADD~~ Temp2() = animalList(i)	
	animalList(i) = nextT()	
	nextT() = Temp2()	
	Next	

ENTER NUMBER OF QUESTION		DO NOT WRITE IN THIS MARGIN
6		
b		
iii	For i = 0 to length of array	
	if animalList(i).readingNumber > 1 then	
	numRem = animalList(i).numberRemaining	
	Loop until animalList(i).mammal = mammal	
	For index = 1 to remaining rows	
	if animalList(i) = animalList(i + index) then	
	mammal = animalList(i + index)	
	row = i + index	
	End if	
	Next	
	Loop	
	if numReg - numReg/20 <=	
	animalList(row).numberremaining then	
	msgbox(mammal & percentage	
	reduction of mamal)	

Candidate 4 (selected questions)

5 a) Overriding is an example of polymorphism. In the UML diagram, the Triangle, Rectangle and Circle classes are all subclasses that inherit and override the calcArea() method from the Shape superclass. Each subclass changes the method upon overriding so they all give a different output when called. It is faster for these subclasses to inherit and override the method than to rewrite the code for the method for each class.

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b) i) An object called r1 is instantiated from the Rectangle class. The values "white", "black", 20 and 16 are passed in for the first four instance variables fillcolour, linecolour, length and breadth. The last instance variable, area is initially set to 0 inside the constructor method

200 [20]

d i) While swapped == True

ii) if list[i].getArea() > list[i+1].getArea():

iii) temp = list[i]
list[i] = list[i+1]
list[i+1] = temp

6 a) ~~Run SQL Query~~ to

Run SQL SELECT query to store all data from the database into a variable

use the mysqli_fetch_arrays statemen to format the data in the variable into an array

Loop for length of the array
animalList[index] = array[index]

Candidate 5 (selected questions)

4. a) This description would be used as a persona for one of the developers during Giving testing. They would assume the role of Greig and use the program like he would, testing all required use cases & end user requirements. This would show how intuitive and easy to use the system would be for someone

ENTER NUMBER OF QUESTION		DO NOT WRITE IN THIS MARGIN
	like Greig.	
	b) Perfective maintenance, as an additional feature is being added that was not originally in the specifications.	
5.	a) Overriding, also known as polymorphism is used to change the behaviour of a method that a subclass has inherited from a superclass without changing its name. In this program it is used to change the behaviour of the calcArea() method that the Triangle, Rectangle, and Circle subclasses have inherited from the Shape superclass, in order to change the equation for area for each shape to the correct one i.e. 3.14 × radius² for circle, length × breadth for rectangle, and base × height / 2 for triangle.	

5 c) ii) list is an array of shape objects, which don't have the getCircumferance() method. Although list[8], c2 is an object of the circle subclass, which has the getCircumference method, only

6. a) connect to database
run query to return all records in MammalData table
assign results to array.
for item in array:
create animal record and
insert data from current array item into record.
add animal record to animalList.

6. b) ii)

```
places = len(temp)

for x in range(len(animallist), 0, -1):
    set animallist[x+places] to
    animallist[x]
    clear animallist[x]
```