COLLEGE OF BUSINESS, PEACE, LEADERSHIP AND GOVERNANCE

NCSE103: OBJECT-ORIENTED SOFTWARE DEVELOPMENT

END OF SECOND SEMESTER EXAMINATIONS

MAY 2021

LECTURER: MR MUKHALELA

DURATION: 7 HOURS

INSTRUCTIONS

Answer any **ONE** question**.** Submit answer to parts (a) as code(s) and output as screenshots via **email**: mukhalelab@africau.edu and part (b) (only applies for some questions) as essay type answers via **Moodle.**

The marks allocated to **each** question are shown at the end of the section. Include citations where possible in your essay type answers.

Credit will be awarded for logical, systematic and neat presentations.

Question One

(a) As a junior Software Engineer who had just joined a team working on an OOP based program, you were told that, 'one of the differences between an analysis class diagram and a design class diagram is the amount of detail shown in the models'. Required: Using a modeling tool like Argo UML, design both analysis and design class diagrams for the proposed AU-Rabbitry system. [25]

(b) Using your Apache NetBeans IDE, illustrate how both inheritance and polymorphism concepts can be harnessed in the proposed AU-Rabbitry system. [25]

Question Two

Imagine you have just joined an IoT- Agri-Solutions concern as a Precision Programmer/Analyst and your very first job was to design and implement an Automatic Computer Control Incubator for a client. You were hinted of some of the following requirements for the program you are to implement in java:

_Has a Temperature Sensor that measures the temperature in the Incubator.

_Has a Humidity Sensor that measures the humidity in the Incubator.

_Has an Egg-Turner-Motor that turns Egg-Trays after every 90 minutes' cycle.

_Has a continuous running Fan

_Has a Heating-Element for raising the internal temperature in the Incubator.

_If Temperature is below 37.5, the Incubator Alarm is set ON.

_If Humidity if below set 60, it activates the Rear Fan

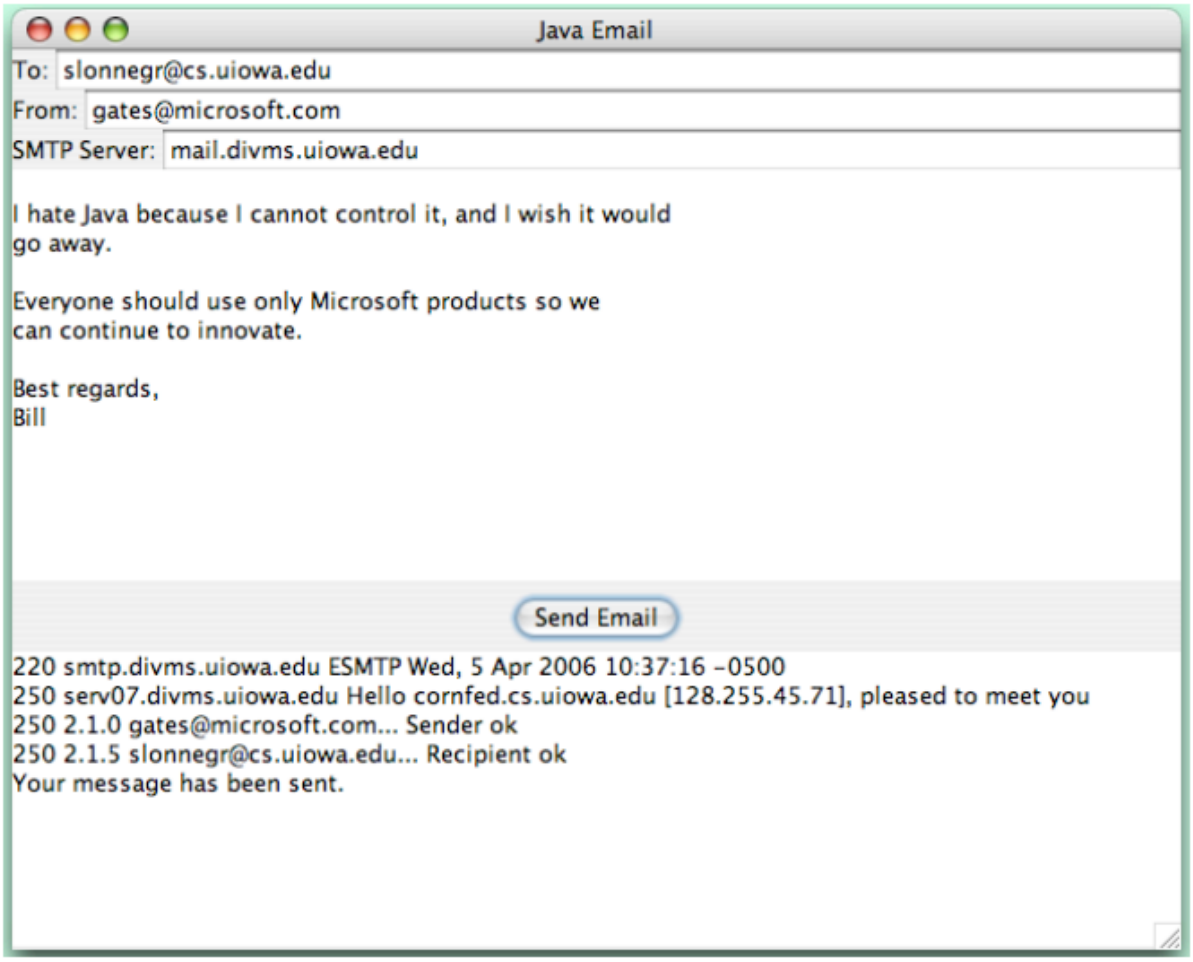
_If Temperature reading if within range of 37.5 – 37.8 the machine operates at optimal condition, no Alarm

Required: Implement the Automatic Computer Controlled Incubator program using java. [50]

Question Three

(a) 'Software systems based on functional decomposition were still being delivered with errors in the code; they were perceived as unreliable and not sufficiently well tested'. Write a comprehensive report to your Director of ICT, arguing why you want the future systems be developed and tested the OO way. [25]

(b) Design a GUI for a proposed system as given below. [25]



END OF EXAMINATION