REPUBLIC POLYTECHNIC

C208 Object Oriented Programming

Assignment

Notice on Plagiarism

Plagiarism is broadly defined as knowingly presenting another person's ideas, findings, or work as one's own. This also means copying or reproducing the work without due acknowledgement of the source. Work submitted for assessment may be regarded as plagiarized where significant portions of the work has been reproduced from the work of another student(s), since this exceeds the boundaries of collaborative learning.

Within the discipline of IT, the following activities are frequently associated with plagiarism and are therefore treated as evidence of academic dishonesty except when carried out legitimately within a declared group project:

   i) making files associated with assessed work available to others, by any means (making such files available is always beyond the boundaries of collaborative learning);

   ii) attempting to view files owned by another student without permission, even when those files have been made accessible to others;

   iii) encouraging other students to carry out operations which have the effect of making files accessible;

   iv) using another student's computer while that student is temporarily absent; taking other students' work from a printer;

   v) using any quantity of material from one or more web sites or other published sources without acknowledgement and attempting to pass it off as one's own work, is also plagiarism with intent to deceive.

Other forms of academic dishonesty include:

   vi) recycling (the submission for assessment of one's own work, or of work which is substantially the same, which has previously been counted towards the satisfactory completion of another unit of study, and credited towards a polytechnic diploma, and where the assessor has not been informed);

   vii) fabrication of data;

   viii) the engagement of another person to complete an assessment or examination in place of the student, whether for payment or otherwise;

   ix) communication, whether by speaking or some other means, to other students during an examination;

   x) bringing into an examination and concealing forbidden material such as text books, notes, calculators, mobile phones or computers;

   xi) attempts to read other students' work during an examination; and

   xii) writing an examination or test paper, or consulting with another person about the examination or test, outside the confines of the examination room without permission.

Students submitting work for assessment in SOI will be required to sign a declaration stating that, except where specifically acknowledged, the work contained in the assignment / project is their own work, has not been copied from other sources and has not been previously submitted for award or assessment.

SOI is opposed to and will not tolerate Plagiarism. It is the responsibility of all students to:
• ensure that they do not commit or collude with another person to commit Plagiarism;
• report possible instances of Plagiarism; and
• comply with this guideline on Academic Dishonesty and Plagiarism.

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Overview

HotelManagement is a program that allows hotel administrator to manage hotel

rooms, members and reservations.

The administrators are able to:

- View all rooms
- Update room price
- Add a new member
- Cancel reservation for a member
- Calculate revenue by year
- Conduct lucky draw

Sample Rooms

number	type	price
101	Premier	638.0
102	Deluxe	858.0
201	Premier	718.8
202	Deluxe	938.8
301	Family	1058.88
302	Family	1058.88

Note that there are **only** 3 tiers:
- Premier
- Deluxe
- Family

Sample Members

id	name	tier
1001	Jack	B
1002	Mary	G
1003	Tim	G
1004	Jim	S

Note that there are **only** 3 tiers:
- B – Basic
- S – Silver
- G – Gold

Sample Reservations

id	arrival date	departure date	room number	member id	paid amount	status
1	09/12/2021	11/12/2021	101	1002	1276.0	confirmed
2	31/12/2021	01/01/2022	202	1004	938.8	confirmed
3	11/02/2022	12/02/2022	302	1004	1058.88	confirmed
4	24/12/2021	26/12/2021	102	1003	1716.0	confirmed

Note that there are **only** 2 statuses:
- confirmed
- cancelled

Date is in **DD/MM/YYYY** format.

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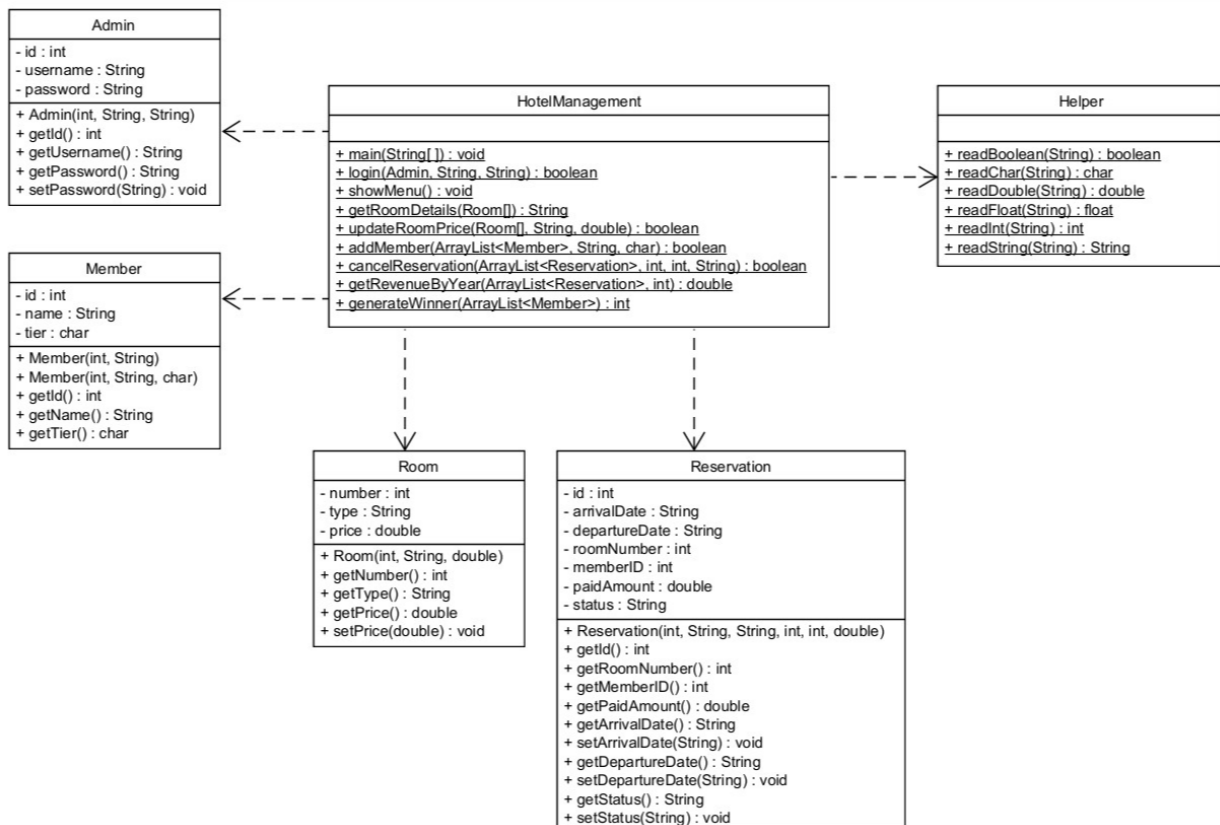
The incomplete **HotelManagement** class is given to you.

* Do NOT change the code or code structure that is provided to you. If you are unclear, please seek your lecturer's advice.

You are tasked to complete the **HotelManagement** program and related classes as shown in the class diagram below.

Class Diagram

Admin

- id : int
- username : String
- password : String

+ Admin(int, String, String)
+ getId() : int
+ getUsername() : String
+ getPassword() : String
+ setPassword(String) : void

HotelManagement

+ main(String[ ]) : void
+ login(Admin, String, String) : boolean
+ showMenu() : void
+ getRoomDetails(Room[]) : String
+ updateRoomPrice(Room[], String, double) : boolean
+ addMember(ArrayList<Member>, String, char) : boolean
+ cancelReservation(ArrayList<Reservation>, int, int, String) : boolean
+ getRevenueByYear(ArrayList<Reservation>, int) : double
+ generateWinner(ArrayList<Member>) : int

Helper

+ readBoolean(String) : boolean
+ readChar(String) : char
+ readDouble(String) : double
+ readFloat(String) : float
+ readInt(String) : int
+ readString(String) : String

Member

- id : int
- name : String
- tier : char

+ Member(int, String)
+ Member(int, String, char)
+ getId() : int
+ getName() : String
+ getTier() : char

Room

- number : int
- type : String
- price : double

+ Room(int, String, double)
+ getNumber() : int
+ getType() : String
+ getPrice() : double
+ setPrice(double) : void

Reservation

- id : int
- arrivalDate : String
- departureDate : String
- roomNumber : int
- memberID : int
- paidAmount : double
- status : String

+ Reservation(int, String, String, int, int, double)
+ getId() : int
+ getRoomNumber() : int
+ getMemberID() : int
+ getPaidAmount() : double
+ getArrivalDate() : String
+ setArrivalDate(String) : void
+ getDepartureDate() : String
+ setDepartureDate(String) : void
+ getStatus() : String
+ setStatus(String) : void

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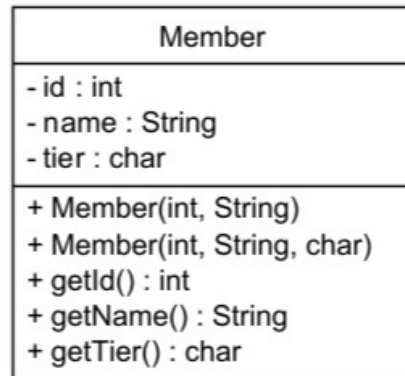C208 Object Oriented Programming
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Section A (8 marks)

Before starting on the **HotelManagement** program, you will first need to create the **Member** class and the **Reservation** class.

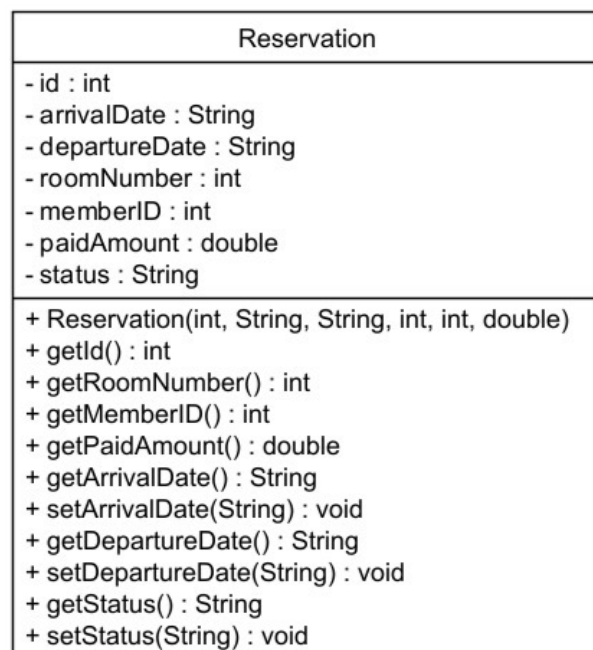*Note: The **Admin** class and the **Room** class are provided.*

Member class

Member
- id : int - name : String - tier : char
+ Member(int, String) + Member(int, String, char) + getId() : int + getName() : String + getTier() : char

Note that there are 2 constructors in this class. The first constructor sets the tier to **'B'** by default. The second constructor initializes all fields with the details passed to it.

Create the **Member** class based on the diagram and the requirement.

Reservation class

Reservation
- id : int - arrivalDate : String - departureDate : String - roomNumber : int - memberID : int - paidAmount : double - status : String
+ Reservation(int, String, String, int, int, double) + getId() : int + getRoomNumber() : int + getMemberID() : int + getPaidAmount() : double + getArrivalDate() : String + setArrivalDate(String) : void + getDepartureDate() : String + setDepartureDate(String) : void + getStatus() : String + setStatus(String) : void

Note that the constructor sets the status to **"confirmed"** by default.

Create the **Reservation** class based on the diagram and the requirement.

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HotelManagement class

HotelManagement
+ main(String[ ]) : void
+ login(Admin, String, String) : boolean
+ showMenu() : void
+ getRoomDetails(Room[]) : String
+ updateRoomPrice(Room[], String, double) : boolean
+ addMember(ArrayList<Member>, String, char) : boolean
+ cancelReservation(ArrayList<Reservation>, int, int, String) : boolean
+ getRevenueByYear(ArrayList<Reservation>, int) : double
+ generateWinner(ArrayList<Member>) : int

A partially completed **HotelManagement.java** is provided to you.

* Do NOT change the code or code structure that is provided to you. If you are unclear, please seek your lecturer's advice.

You should only complete the code in the sections with the comment as below:

```
// TODO complete the code here
```

Remember to fill in the declaration details in the **HotelManagement.java** and any java files that you created.

```
/*
 *
 * I declare that this code was written by me.
 * I will not copy or allow others to copy my code.
 * I understand that copying code is considered as plagiarism.
 *
 * Student Name:
 * Student ID:
 * Class:
 * Date/Time Last modified:
 *
 */
```

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> **NOTE:**
> - **All screenshots shown are sample output.**
> - **You should avoid hardcoding in your solution where possible.**
> - **You MUST follow the structure of the code provided.**

Section B (3 marks)

Admin Login

Hotel administrators are able to login and perform the following tasks:

- View all rooms
- Update room price
- Add a new member
- Cancel reservation for a member
- Calculate revenue by year
- Conduct lucky draw

When the program is executed, the administrator will be asked to enter his/her username and password.

```
=============================
HOTEL MANAGEMENT - LOGIN
=============================
Enter username > jay_chew
Enter password > 654abc
```

If the **username or password** is incorrect, the program will display the output as shown:

```
=============================
HOTEL MANAGEMENT - LOGIN
=============================
Enter username > jay_chew
Enter password > 654321
Your username or password was incorrect. Try again!
```

If both are correct, the following menu will be shown to the administrator:

```
=============================
HOTEL MANAGEMENT - LOGIN
=============================
Enter username > jay_chew
Enter password > 654abc
=============================
MENU
=============================
1. View all rooms
2. Update room price
3. Add a new member
4. Cancel reservation for a member
5. Calculate revenue by year
6. Conduct lucky draw
7. Log out
Enter option >
```

If the administrator entered option 7, he/she will be logged out and prompted to login again.

```
7. Log out
Enter option > 7
See you!
=============================
HOTEL MANAGEMENT - LOGIN
=============================
Enter username >
```

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Section C (6 marks)

View all rooms

When the administrator enters option 1, all room details will be displayed as shown:

```
==============================
MENU
==============================
1. View all rooms
2. Update room price
3. Add a new member
4. Cancel reservation for a member
5. Calculate revenue by year
6. Conduct lucky draw
7. Log out
Enter option > 1
NUMBER      TYPE        PRICE
101         Premier     638.00
102         Deluxe      858.00
201         Premier     718.80
202         Deluxe      938.80
301         Family      1058.88
302         Family      1058.88
```

Update room price

When the administrator enters option 2, he/she will be prompted to update the price **for certain type** of rooms.

As shown below, the administrator would be prompted to enter one of the room types (**case insensitive**).

The administrator would also be prompted to enter the percentage of the price change.
- If the percentage is **positive**, **increase** the price by it for the type of room entered.
- If the percentage is **negative**, **decrease** the price by it for the type of room entered.
- The percentage **should NOT be smaller than -100**.

```
==============================
MENU
==============================
1. View all rooms
2. Update room price
3. Add a new member
4. Cancel reservation for a member
5. Calculate revenue by year
6. Conduct lucky draw
7. Log out
Enter option > 2
Enter room type > deluxe
Enter the percentage > 20
```

Once updated, the new price should be shown immediately.

```
==============================
MENU
==============================
1. View all rooms
2. Update room price
3. Add a new member
4. Cancel reservation for a member
5. Calculate revenue by year
6. Conduct lucky draw
7. Log out
Enter option > 2
Enter room type > deluxe
Enter the percentage > 20
NUMBER      TYPE       PRICE
101         Premier    638.00
102         Deluxe     1029.60
201         Premier    718.80
202         Deluxe     1126.56
301         Family     1058.88
302         Family     1058.88


==============================
MENU
==============================
1. View all rooms
2. Update room price
3. Add a new member
4. Cancel reservation for a member
5. Calculate revenue by year
6. Conduct lucky draw
7. Log out
Enter option > 2
Enter room type > premier
Enter the percentage > -10
NUMBER      TYPE       PRICE
101         Premier    574.20
102         Deluxe     1029.60
201         Premier    646.92
202         Deluxe     1126.56
301         Family     1058.88
302         Family     1058.88
```

Sample of **invalid** cases:

```
==============================
MENU
==============================
1. View all rooms
2. Update room price
3. Add a new member
4. Cancel reservation for a member
5. Calculate revenue by year
6. Conduct lucky draw
7. Log out
Enter option > 2
Enter room type > family
Enter the percentage > -150
Failed to update. Check the room type or the percentage entered.
==============================
MENU
==============================
1. View all rooms
2. Update room price
3. Add a new member
4. Cancel reservation for a member
5. Calculate revenue by year
6. Conduct lucky draw
7. Log out
Enter option > 2
Enter room type > standard
Enter the percentage > -30
Failed to update. Check the room type or the percentage entered.
```

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Section D (9 marks)

Add a new member

When the administrator enters option 3, he/she will be prompted to add a new member by entering the new member's name and tier.

The member ID is a running number starting from 1001. Hence, for instance, if there are 4 existing members (1001 ~ 1004), the ID of the new member should be 1005.

```
==============================
MENU
==============================
1. View all rooms
2. Update room price
3. Add a new member
4. Cancel reservation for a member
5. Calculate revenue by year
6. Conduct lucky draw
7. Log out
Enter option > 3
Enter member name > Peter
Enter member tier > G
New member added.
```

If the name is empty or the tier is invalid (other than the 3 tiers described above), the new member should NOT be added. Instead, an error message will be displayed as shown:

```
==============================
MENU
==============================
1. View all rooms
2. Update room price
3. Add a new member
4. Cancel reservation for a member
5. Calculate revenue by year
6. Conduct lucky draw
7. Log out
Enter option > 3
Enter member name >
Enter member tier > G
Failed to add. Check the name and tier entered.
==============================
MENU
==============================
1. View all rooms
2. Update room price
3. Add a new member
4. Cancel reservation for a member
5. Calculate revenue by year
6. Conduct lucky draw
7. Log out
Enter option > 3
Enter member name > Jerry
Enter member tier > A
Failed to add. Check the name and tier entered.
```

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Cancel reservation for a member

When the administrator enters option 4, he/she will be prompted to cancel reservation for a member by entering the member ID, the room number and the arrival date (DD/MM/YYYY).

If such reservation exists based on the information entered, the status of the reservation should be changed from "confirmed" to "cancelled" to indicate the reservation is cancelled.

If such reservation does NOT exist based on the information entered or the reservation has already been cancelled, an error message will be displayed as shown below.

*Note that the paid amount is **non-refundable** even if the reservation is cancelled.*

```
==============================
MENU
==============================
1. View all rooms
2. Update room price
3. Add a new member
4. Cancel reservation for a member
5. Calculate revenue by year
6. Conduct lucky draw
7. Log out
Enter option > 4
Enter member ID > 1004
Enter room number > 202
Enter arrival date (DD/MM/YYYY) > 31/12/2021
The reservation has been cancelled successfully.
==============================
MENU
==============================
1. View all rooms
2. Update room price
3. Add a new member
4. Cancel reservation for a member
5. Calculate revenue by year
6. Conduct lucky draw
7. Log out
Enter option > 4
Enter member ID > 1004
Enter room number > 202
Enter arrival date (DD/MM/YYYY) > 31/12/2021
Failed to cancel. The reservation may not exist or have been cancelled.
==============================
MENU
==============================
1. View all rooms
2. Update room price
3. Add a new member
4. Cancel reservation for a member
5. Calculate revenue by year
6. Conduct lucky draw
7. Log out
Enter option > 4
Enter member ID > 1004
Enter room number > 201
Enter arrival date (DD/MM/YYYY) > 31/12/2021
Failed to cancel. The reservation may not exist or have been cancelled.
```

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Calculate revenue by year

When the administrator enters option 5, he/she will be prompted to enter a year. Then the program will calculate and display the total revenue for the year entered. The total revenue is equal to the sum of the paid amount for all the reservations made in the year.

As long as the year of the **departure date** is the same as the year entered, the reservation should be counted in the calculation. Reservation would NOT be counted if **only** the year of the arrival date is the same as the year entered. *Some samples are shown in the following table, assuming that the year entered is **2021**.*

Scenario	Arrival Date	Departure Date	Counted?
1	30/12/2021	31/12/**2021**	Yes
2	31/12/2021	01/01/**2022**	No

Note that the hotel opened in 2010. Hence, if the year entered is earlier than 2010, an error message will be displayed as shown below.

*Note that the paid amount is **non-refundable** even if the reservation is cancelled.*

```
==============================
MENU
==============================
1. View all rooms
2. Update room price
3. Add a new member
4. Cancel reservation for a member
5. Calculate revenue by year
6. Conduct lucky draw
7. Log out
Enter option > 5
Enter the year > 2021
The total revenue for Year 2021 is 2992.00
==============================
MENU
==============================
1. View all rooms
2. Update room price
3. Add a new member
4. Cancel reservation for a member
5. Calculate revenue by year
6. Conduct lucky draw
7. Log out
Enter option > 5
Enter the year > 2008
The year entered is invalid.
```

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Section E (2 marks)

Conduct lucky draw

When the administrator enters option 6, the program will conduct a lucky draw by **randomly** selecting a **silver or gold** tier member from all the members. The winner's member ID should be displayed as shown.

```
==============================
MENU
==============================
1. View all rooms
2. Update room price
3. Add a new member
4. Cancel reservation for a member
5. Calculate revenue by year
6. Conduct lucky draw
7. Log out
Enter option > 6
The winner is Member 1003
```

Section F (12 marks) - Interview

Now that you have completed the program, you are to present what you have completed.

You MUST be prepared to explain any part of the code submitted, the logic behind your code, and modify the program during the one to one interview.

Code quality and organization is also taken into consideration when awarding marks.

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Administrative Matters

If you find that certain important information about the requirements is missing or ambiguous, please approach your lecturer or Module Chair for clarification.

On Submission and Plagiarism:
- You MUST attend the interview session for the assignment to be considered.
- If a student is found to have copied, or allowed another student to copy his/her work, disciplinary action will be taken against all parties involved.
- If you are found outsourcing your work or involved in any forms of cheating, you will be deemed to have failed the assignment. You will also be referred to the Disciplinary Committee.
- All Java files submitted must have the following at the top of the file with their details filled in:

```
/*
 * I declare that this code was written by me.
 * I will not copy or allow others to copy my code.
 * I understand that copying code is considered as plagiarism.
 *
 * Student Name:
 * Student ID:
 * Class:
 * Date/Time Last modified:
 */
```

- Penalties will be applied for late submissions.
- In the event that your lecturer is not able to find your files, you will be deemed to have not submitted.
- If you fail to submit your files, you will not be granted an evaluation timeslot and will be deemed to have failed the assignment.
- If you have submitted your files but did not turn up for your allocated interview timeslot, you will be deemed to have failed the assignment, unless you have a valid LOA for that day. In such case, you are responsible to inform your lecturer to re-schedule the evaluation.
- The code that you present during the evaluation must be the same as the code you submitted.
- Marks will be deducted for any requirement or instruction that is not fulfilled by you.

Submission deadline: 06 February 2022, Sunday 11:59PM

Final Deliverables:

- HotelManagement.java
- Reservation.java
- Member.java

Submission

- Upload to SA 2.0

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Penalties apply for late submission:

Time after submission deadline	Between 0 and ≤ 24 hours	Between 24 and ≤ 48 hours	Between 48 and ≤ 72 hours	After 72 hours
Downgrading applied to submitted work	10% of the maximum score for the submitted work	20% of the maximum score for the submitted work	30% of the maximum score for the submitted work	100% of the maximum score for the submitted work, i.e. award zero marks

Recommendation:

- You may submit your work in progress at any time before the submission deadline for this assignment. It is recommended that you do so at least one week before the submission deadline.

- Do not wait till the last hour or minute to submit your work.

- It is your responsibility to make regular backups of your work both on SA and on your own HDD/thumb drives.

- Ensure that your code can be compiled and executed.

  - In the event that you are not able to get the code to execute, you should still submit whatever code you have written.