STUDENT NO: 30HA2409823

COURSE: HSYD100-1 FA3

QUESTION 1

1.1 import java.util.Scanner;

```
public class CharacterValidation {
   public static void main(String[] args) {
      // Create a Scanner object for user input
      Scanner scanner = new Scanner(System.in);

      // Prompt user for input
      System.out.print("Enter a character: ");
        inputChar = scanner.next().charAt(0);

      // Processing: Validate if the character is a letter or a digit
      if (Character.isLetter(inputChar)) {
         System.out.println("The character entered is a letter.");
      } else if (Character.isDigit(inputChar)) {
         System.out.println("The character entered is a digit.");
      } else {
         System.out.println("The character entered is neither a letter nor a digit.");

      // Close the scanner
      Scanner.close();
```

Code explanation

Input: The program starts by importing `Scanner`,encouraging the user to enter a character, and using `scanner.next().charAt(0)` to capture the first character of the input.

Processing: The `Character.isLetter` and `Character.isDigit` methods check if the entered character is a letter or digit.

Output: The program prints the result in the console,informing the user if the character is a letter,a digit or neither.

1.2 import java.util.Scanner;

```
public class PasswordAuthentication {
  public static void main(String[] args) {
    // Predefined password
    String storedPassword = "Secure123";

    // Create a Scanner object for user input
    Scanner scanner = new Scanner(System.in);

    // Prompt user for password
    System.out.print("Enter your password: ");
    String enteredPassword = scanner.nextLine();

    // Processing: Validate if entered password matches stored password
    if (enteredPassword.equals(storedPassword)) {
      // Output for correct password
```

```
            System.out.println("Welcome! The password is correct.");
        } else {
            // Output for incorrect password
            System.out.println("Access denied. Incorrect password.");
        }

        // Close the scanner
        scanner.close();
    }
}
```

Code explanation

Input: The program defines a `storedPassword` variable, then prompts the user to enter a password.

Processing: The program uses the `equals` method of the `String` class to compare the `enteredPassword` with the `storedPassword`.

Output: If the password matches, it displays a welcome message; otherwise, it displays "Access denied."

QUESTION 2

2.1

```
public class MembershipDetails {
    public static void main(String[] args) {
        // Array to store membership types
        String[] memberships = {
            "1. Basic Membership: Access to gym equipment and locker rooms.",
            "2. Silver Membership: Access to gym equipment, locker rooms, and group classes.",
            "3. Gold Membership: Access to gym equipment, locker rooms, group classes, and sauna.",
            "4. Platinum Membership: Access to all facilities including personal training sessions."
        };

        // Use a for loop to display each membership type
        System.out.println("Mo'Muscle Gym Membership Types:");
        for (int i = 0; i < memberships.length; i++) {
            System.out.println(memberships[i]);
        }
```

2.2
```
class MoMuscleGym {
    private String membershipType;
    private String details;

    // Constructor
```

```
    public MoMuscleGym(String membershipType, String details) {
        this.membershipType = membershipType;
        this.details = details;
    }

    // Getter for membershipType
    public String getMembershipType() {
        return membershipType;
    }

    // Getter for details
    public String getDetails() {
        return details;
    }

    // Static method to search for a specific membership type
    public static MoMuscleGym searchMembership(MoMuscleGym[] memberships,
String membershipType) {
        for (MoMuscleGym membership : memberships) {
            if (membership.getMembershipType().equalsIgnoreCase(membershipType)) {
                return membership;
            }
        }
        return null; // Return null if no match is found
    }
```