Section 1: Error-Driven Learning in Java

1.

Code:

```
public class Main{
public void main(String[] args){
System.out.println("Hello, World!");
}
}
```

Error:

1)Save file with name Main.java
2)Main method is not static in class Main, please define the main method as: public static void main(String[] args)

Corrected Code:

```
public class Main{
public static void main(String[] args){
System.out.println("Hello, World!");
}
}
```

2.

Code:

```
public class Main {
   static void main(String[] args) {
      System.out.println("Hello, World!");
   }
}
```

Error:

Main method not found in class Main, please define the main method as:
  public static void main(String[] args)
or a JavaFX application class must extend javafx.application.Application

Corrected Code:

```
public class Main {
   public static void main(String[] args) {
      System.out.println("Hello, World!");
```

```
  }
}
```

3.

Code:

```
public class Main {
  public static int main(String[] args) {
    System.out.println("Hello, World!");
    return 0;
  }

}
```

Error:

1) Main method must return a value of type void in class Main, please define the main method as:
  public static void main(String[] args)

2) incompatible types: unexpected return value
    return 0;

Corrected Code:

```
public class Main {
  public static void main(String[] args) {
    System.out.println("Hello, World!");
    return;
  }

}
```

4.

Code:

```
public class Main {
  public static void main() {
    System.out.println("Hello, World!");
  }
}
```

Error:
Main method not found in class Main, please define the main method as:
  public static void main(String[] args)
or a JavaFX application class must extend javafx.application.Application

Corrected Code:

```
public class Main {
   public static void main(String args[]) {
      System.out.println("Hello, World!");
   }
}
```

5.
Code:

```
public class Main {
   public static void main(String[] args) {
      System.out.println("Main method with String[] args");
   }
   public static void main(int[] args) {
      System.out.println("Overloaded main method with int[] args");
   }
}
```

Error:
Main method not found in class Main, please define the main method as:
  public static void main(String[] args)
or a JavaFX application class must extend javafx.application.Application

Corrected Code:

```
public class Main {
   public static void main(String[] args) {
      System.out.println("Main method with String[] args");
   }
   public static void main(String[] args) {
      System.out.println("Overloaded main method with int[] args");
   }
}
```

6.

Code:

```
public class Main {
   public static void main(String[] args) {
      int x = y + 10;
      System.out.println(x);
   }
}
```

Error:

```
cannot find symbol
      int x = y + 10;
            ^
 symbol:   variable y
 location: class Main
```

Corrected Code:

```
public class Main {
   public static void main(String[] args) {
int y = 20;
      int x = y + 10;
      System.out.println(x);
   }
}
```

7.

Code:

```
public class Main {
   public static void main(String[] args) {
      int x = "Hello";
      System.out.println(x);
   }
}
```

Error:

incompatible types: String cannot be converted to int
```
    int x = "Hello";
```

Corrected Code:

```
public class Main {
  public static void main(String[] args) {
    String x = "Hello";
    System.out.println(x);
  }
}
```

8.

Code:

```
public class Main {
  public static void main(String[] args) {
    System.out.println("Hello, World!"
  }
}
```

Error:

1) ')' expected
```
    System.out.println("Hello, World!"
```
2) ';' expected
```
    System.out.println("Hello, World!")
```

Corrected Code:

```
public class Main {
  public static void main(String[] args) {
    System.out.println("Hello, World!");
  }
}
```

9.

Code:

```
public class Main {
  public static void main(String[] args) {
```

```
    int class = 10;
    System.out.println(class);
  }
}
```

Error:

1) not a statement
```
    int class = 10;
```
2) ';' expected
```
    int class = 10;
```
3) Main.java:3: error: <identifier> expected
```
    int class = 10;
```
4) illegal start of expression
```
    System.out.println(class);
```
5) <identifier> expected
```
    System.out.println(class);
```

Corrected Code:

```
public class Main {
  public static void main(String[] args) {
    int num = 10;
    System.out.println(num);
  }
}
```

10.

Code:

```
public class Main {
  public void display() {
    System.out.println("No parameters");
  }
  public void display(int num) {
    System.out.println("With parameter: " + num);
  }
```

```
  public static void main(String[] args) {
    display();
    display(5);
  }
}
```

Error:

1) non-static method display() cannot be referenced from a static context
    display();
2) non-static method display(int) cannot be referenced from a static context
    display(5);

Corrected Code:

```
public class Main {

  public void display() {
    System.out.println("No parameters");
  }

  public void display(int num) {
    System.out.println("With parameter: " + num);
  }

  public static void main(String[] args) {
    Main obj = new Main(); // we have to create an object
    obj.display();
    obj.display(5);
  }
}
```

11.

Code:

```
public class Main {
  public static void main(String[] args) {
    int[] arr = {1, 2, 3};
    System.out.println(arr[5]);
  }
```

```
}
```

Error:

```
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException:
Index 5 out of bounds for length 3
    at Main.main(Main.java:4)
```

Corrected Code:

```
public class Main {
  public static void main(String[] args) {
    int[] arr = {1, 2, 3};
    System.out.println(arr[0]);
  }
}
```

12.

Code:

```
public class Main {
  public static void main(String[] args) {
    while (true) {
      System.out.println("Infinite Loop");
    }
  }
}
```

Error:

```
Infinite Loop
```

Corrected Code:

```
public class Main {
  public static void main(String[] args) {
    while (true) {
      System.out.println("Infinite Loop");
break;
    }
  }
}
```

13.

Code:

```
public class Main {
   public static void main(String[] args) {
      String str = null;
      System.out.println(str.length());
   }
}
```

Error:

```
Exception in thread "main" java.lang.NullPointerException: Cannot invoke
"String.length()" because "<local1>" is null
      at Main.main(Main.java:4)
```

Corrected Code:

```
public class Main {
   public static void main(String[] args) {
      String str = "null";
      System.out.println(str.length());
   }
}
```

14.

Code:

```
public class Main {
   public static void main(String[] args) {
      double num = "Hello";
      System.out.println(num);
   }
}
```

Error:

```
incompatible types: String cannot be converted to double
      double num = "Hello";
```

Corrected Code:

```
public class Main {
  public static void main(String[] args) {
    String num = "Hello";
    System.out.println(num);
  }
}
```

15.

Code:

```
public class Main {
  public static void main(String[] args) {
    int num1 = 10;
    double num2 = 5.5;
    int result = num1 + num2;
    System.out.println(result);
  }
}
```

Error:

```
incompatible types: possible lossy conversion from double to int
    int result = num1 + num2;
```

Corrected Code:

```
public class Main {
  public static void main(String[] args) {
    int num1 = 10;
    double num2 = 5.5;
    double result = num1 + num2;
    System.out.println(result);
  }
}
```

16.

Code:

```
public class Main {
  public static void main(String[] args) {
    int num = 10;
    double result = num / 4;
    System.out.println(result);
  }
}
```

Error:
Output got 2.0 but it should be 2.5

Corrected Code:

```
public class Main {
  public static void main(String[] args) {
    double num = 10;
    double result = num / 4;
    System.out.println(result);
  }
}
```

17.

Code:

```
public class Main {
  public static void main(String[] args) {
    int a = 10;
    int b = 5;
    int result = a ** b;
    System.out.println(result);
  }
}
```

Error:

illegal start of expression

```
    int result = a ** b;
```

Corrected Code:

```
public class Main {
   public static void main(String[] args) {
      int a = 10;
      int b = 5;
      int result = a * b;
      System.out.println(result);
   }
}
```

18.

Code:

```
public class Main {
   public static void main(String[] args) {
      int a = 10;
      int b = 5;
      int result = a + b * 2;
      System.out.println(result);
   }
}
```

Error:

There is no error in this code and getting output as 20.
If addition should done first then we have to use parenthesis.
(a+b)*2

Corrected Code:

```
public class Main {
   public static void main(String[] args) {
      int a = 10;
      int b = 5;
      int result = (a + b) * 2;
      System.out.println(result);
   }
}
```

19.

Code:

```
public class Main {
   public static void main(String[] args) {
      int a = 10;
      int b = 0;
      int result = a / b;
      System.out.println(result);
   }
}
```

Error:

Cant divide by Zero.

We can also use exception handling but we have not covered that topic yet.

Corrected Code:

```
public class Main {
   public static void main(String[] args) {
      int a = 10;
      int b = 0;
      int result = b/a;
      System.out.println(result);
   }
}
```

20.

Code:

```
public class Main {
   public static void main(String[] args) {
      System.out.println("Hello, World")
   }
}
```

Error:

; expected

Corrected Code:

```
public class Main {
```

```
  public static void main(String[] args) {
    System.out.println("Hello, World");
  }
}
```

21.

Code:

```
public class Main {
  public static void main(String[] args) {
    System.out.println("Hello, World!");
  // Missing closing brace here
}
```

Error:

```
reached end of file while parsing
}
```

Corrected Code:

```
public class Main {
  public static void main(String[] args) {
    System.out.println("Hello, World!");
}
}
```

22.

Code:

```
public class Main {
  public static void main(String[] args) {
    static void displayMessage() {
      System.out.println("Message");
    }
  }
}
```

Error:
Can not declare method inside another method.

Corrected Code:

```
public class Main {

  public static void main(String[] args) {
    displayMessage();
    System.out.println("Message");
  }
}
```

23.
Code:

```
public class Confusion {
  public static void main(String[] args) {
    int value = 2;
    switch(value) {
      case 1:
        System.out.println("Value is 1");
      case 2:
        System.out.println("Value is 2");
      case 3:
        System.out.println("Value is 3");
      default:
        System.out.println("Default case");
    }
  }
}
```

Error:
Save file with name Confusion.java
Break statements are not used.

Corrected Code:

```
public class Confusion {
```

```
  public static void main(String[] args) {
    int value = 2;
    switch(value) {
      case 1:
        System.out.println("Value is 1");
break;
      case 2:
        System.out.println("Value is 2");
break;
      case 3:
        System.out.println("Value is 3");
break;
      default:
        System.out.println("Default case");
    }
  }
}
```

24.

Code:

```
public class MissingBreakCase {
  public static void main(String[] args) {
    int level = 1;
    switch(level) {
      case 1:
        System.out.println("Level 1");
      case 2:
        System.out.println("Level 2");
      case 3:
        System.out.println("Level 3");
      default:
        System.out.println("Unknown level");
    }
  }
}
```

Error:
1)Save file with name MissingBreakCase.java
2)Use break statements.

Corrected Code:

```
public class MissingBreakCase {
   public static void main(String[] args) {
      int level = 1;
      switch(level) {
         case 1:
            System.out.println("Level 1");
break;
         case 2:
            System.out.println("Level 2");
break;
         case 3:
            System.out.println("Level 3");
break;
         default:
            System.out.println("Unknown level");
      }
   }
}
```

25.
Code:

```
public class Switch {
   public static void main(String[] args) {
      double score = 85.0;
      switch(score) {
         case 100:
            System.out.println("Perfect score!");
            break;
         case 85:
            System.out.println("Great job!");
            break;
         default:
```

```
            System.out.println("Keep trying!");
        }
    }
}
```

Error:

1)Save file with name Switch.java

2) Use type casting to convert double into int

Corrected Code:

```
public class Switch {
    public static void main(String[] args) {
        double score = 85.0;
        switch((int)score) {
            case 100:
                System.out.println("Perfect score!");
                break;
            case 85:
                System.out.println("Great job!");
                break;
            default:
                System.out.println("Keep trying!");
        }
    }
}
```

26.

Code:

```
public class Switch {
    public static void main(String[] args) {
        int number = 5;
        switch(number) {
            case 5:
                System.out.println("Number is 5");
```

```
            break;
        case 5:
            System.out.println("This is another case 5");
            break;
        default:
            System.out.println("This is the default case");
    }
  }
}
```

Error:

Duplicate cases are not allowed to use that's why we have to change one case.

Or we have to combine these two statements like this:

```
case 5:
        System.out.println("Number is 5");
        System.out.println("This is another case 5");
        break;
```

Corrected Code:

```
public class Switch {
  public static void main(String[] args) {
    int number = 5;
    switch(number) {
      case 5:
        System.out.println("Number is 5");


        break;
      case 6:
        System.out.println("This is another case 5");
        break;
      default:
        System.out.println("This is the default case");
    }
  }
```

```
}
```

Section 2: Java Programming with Conditional Statements

Question 1: Grade Classification

```
class Grade_classification{
public static void main(String args[]){

int score = 70;

if (score >= 90){
System.out.println("Grade A");
}
else if(score>=80 && score<=89){
System.out.println("Grade B");
}
else if(score>=70 && score<=79){
System.out.println("Grade C");
}
else if(score>=60 && score<=69){
System.out.println("Grade D");
}
else{
System.out.println("Grade F");
}

}

}
```

Question 2: Days of the Week

```
class WeekDays{
public static void main(String args[]){

int week = 8;

switch(week){
case 1:
System.out.println("It is Monday");
System.out.println("It's a Weekday");
break;
case 2:
System.out.println("It is Tuesday");
System.out.println("It's a Weekday");
break;
case 3:
System.out.println("It is Wednesday");
System.out.println("It's a Weekday");
break;
case 4:
System.out.println("It is Thursday");
System.out.println("It's a Weekday");
break;
case 5:
System.out.println("It is Friday");
System.out.println("It's a Weekday");
break;
case 6:
System.out.println("It is Saturaday");
System.out.println("It's a Weekend");
break;
case 7:
System.out.println("It is Sunday");
System.out.println("It's a Weekend");
break;
default:
System.out.println("Invalid week");
```

```
break;

}


}

}
```

Question 3: Calculator

```
class Calculator{
public static void main(String args[]){

int num1 = 25;
int num2 = 3;
int operator = '/';

switch(operator){

case '+':
System.out.println("Addition : " + (num1+num2));
break;
case '-':
System.out.println("Subtraction : " + (num1-num2));
break;
case '*':
System.out.println("Multiplication : " + (num1*num2));
break;
case '/':
if (num2 == 0){
System.out.println("Can not divide by 0");
break;
}
else{
System.out.println("Division : " + ((float)num1/snum2));
break;
```

```
}
default:
System.out.println("Give correct operator");
}

}
}
```

Question 4: Discount Calculation

```
class Discount{
public static void main(String args[]){

int purchase = 700;
boolean membership = true;

if(membership == true){

if (purchase>= 1000){
int discount = (purchase * 25)/100;
System.out.println("Discount is " + discount);
}
else if (purchase>=500 && purchase<1000){
int discount = (purchase * 15)/100;
System.out.println("Discount is " + discount);
}
else
{
int discount = (purchase * 10)/100;
System.out.println("Discount is " + discount);

}
}
else{

if (purchase>= 1000){
int discount = (purchase * 20)/100;
```

```
System.out.println("Discount is " + discount);
}
else if (purchase>=500 && purchase<1000){
int discount = (purchase * 10)/100;
System.out.println("Discount is " + discount);
}
else
{
int discount = (purchase * 5)/100;
System.out.println("Discount is " + discount);

}
}

}
}
```

Question 5: Student Pass/Fail Status with Nested Switch

```
class StudentResult{
public static void main(String args[]){

int sub1=40;
int sub2=40;
int sub3=40;

int count = 0;

if (sub1>=40 && sub2>=40 && sub3>=40){
System.out.println("Pass in all subject");
}
else{
if (sub1<40){
count++;
}
if(sub2<40){
count++;
```

```
}
if(sub3<40){
count++;
}


switch(count){
case 1:
System.out.println("Fail in 1 subject");
break;
case 2:
System.out.println("Fail in 2 subject");
break;
case 3:
System.out.println("Fail in all subject");
break;
}
}


}
}
```