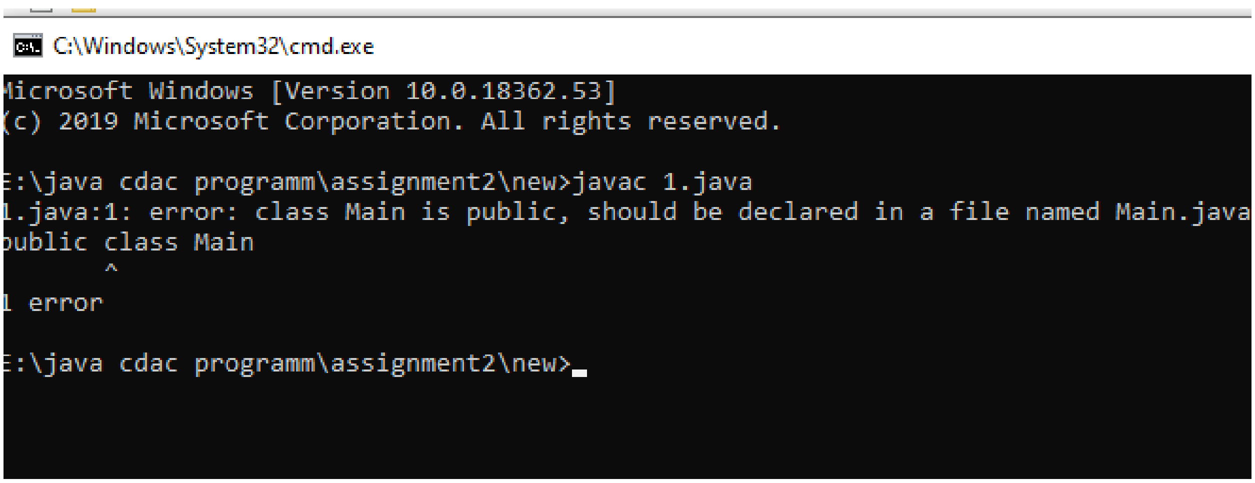
ASSIGNMENT NO 2(Logic building)

Snap 1:

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

Error



```
icrosoft Windows [Version 10.0.18362.53]
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:\java cdac programm\assignment2\new>javac 1.java
.java:1: error: class Main is public, should be declared in a file named Main.java
ublic class Main
       ^
 error

:\java cdac programm\assignment2\new>
```
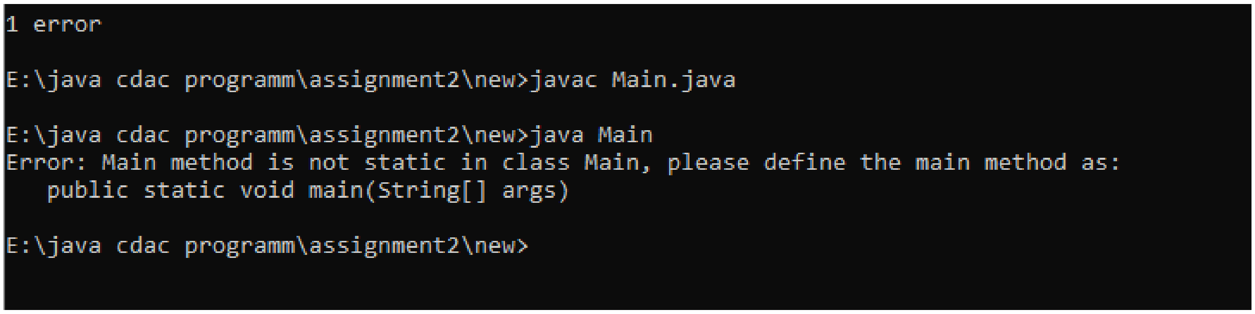

Solution

When any Class is Public the Class name and File name is write is same.

E.g. in our above program Class name is Main then I have to File save is same name.

2nd Error is



```
1 error

E:\java cdac programm\assignment2\new>javac Main.java

E:\java cdac programm\assignment2\new>java Main
Error: Main method is not static in class Main, please define the main method as:
   public static void main(String[] args)

E:\java cdac programm\assignment2\new>
```

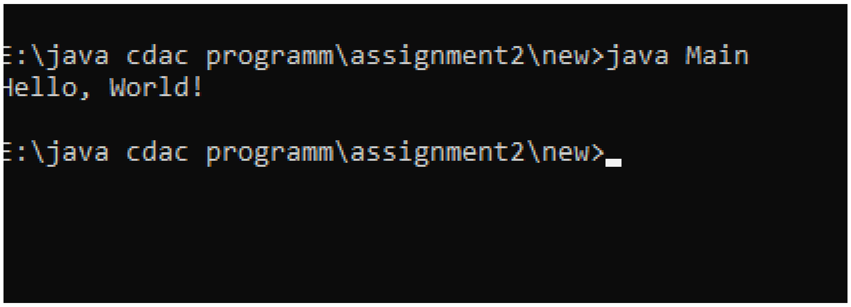
Solution of 2nd error is

Write proper syntax

Correct code:

```
public class Main {

    public static void main(String[] args) {

        System.out.println("Hello, World!");

   }

}
```

Output:

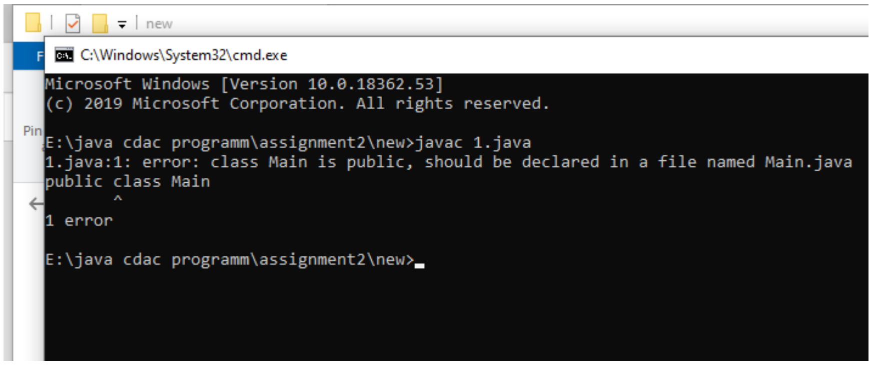


```
E:\java cdac programm\assignment2\new>java Main
Hello, World!

E:\java cdac programm\assignment2\new>_
```

2.

```
public class Main {

   static void main(String[] args) {

        System.out.println("Hello, World!");

   }

}
```

Error:



```
Microsoft Windows [Version 10.0.18362.53]
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E:\java cdac programm\assignment2\new>javac 1.java
1.java:1: error: class Main is public, should be declared in a file named Main.java
public class Main
       ^
1 error

E:\java cdac programm\assignment2\new>_
```
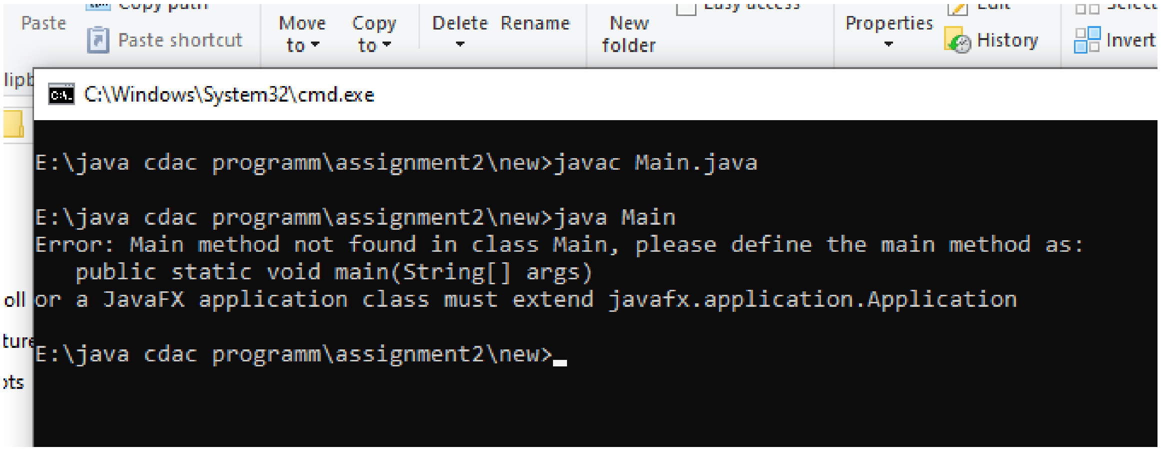

Solution:

any Class is Public the Class name and File name is write is same.

2nd error



```
E:\java cdac programm\assignment2\new>javac Main.java

E:\java cdac programm\assignment2\new>java Main
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

E:\java cdac programm\assignment2\new>_
```

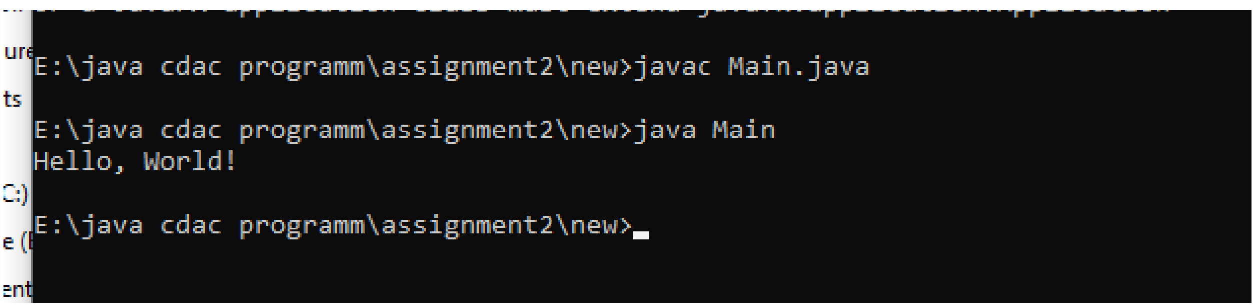
Solution of 2nd error is

Write proper syntax

Correct Code:

```
public class Main {

    public static void main(String[] args) {

        System.out.println("Hello, World!");

   }

}
```

Output

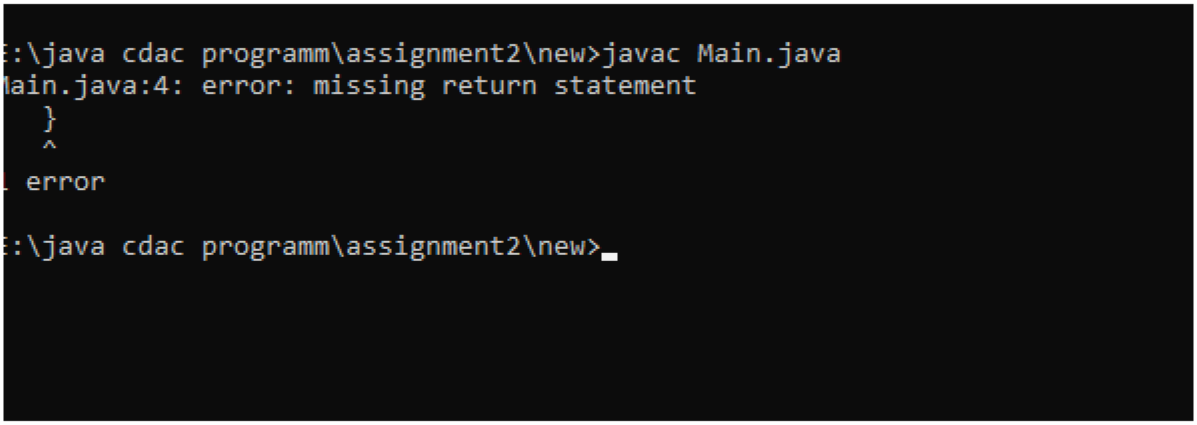


```
E:\java cdac programm\assignment2\new>javac Main.java

E:\java cdac programm\assignment2\new>java Main
Hello, World!

E:\java cdac programm\assignment2\new>_
```

3.

```
   public class Main {

   public static int main(String[] args) {

       System.out.println("Hello, World!");

  }

}
```

Error



```
:\java cdac programm\assignment2\new>javac Main.java
ain.java:4: error: missing return statement
   }
   ^
 error

:\java cdac programm\assignment2\new>
```

Solution:

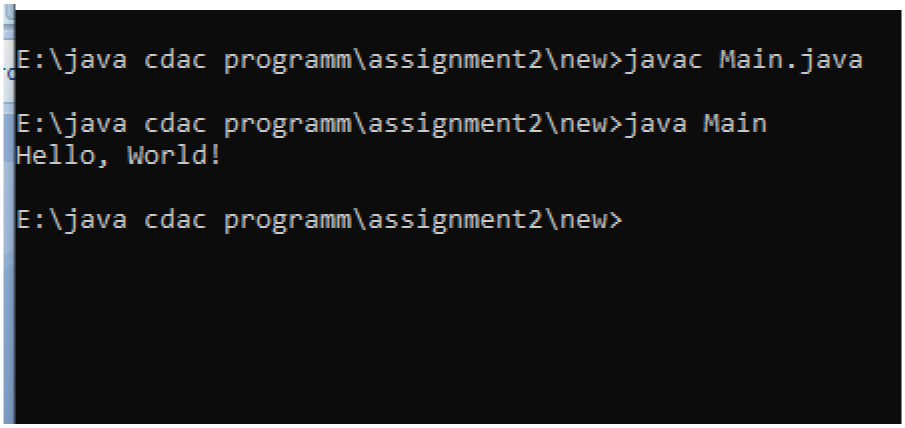
Write Proper syntax

And Main not return anything. That is why Void method is used for Main.

Correct Code:

```
public class Main {

   public static void main(String[] args) {

       System.out.println("Hello, World!");

  }

}
```

Output



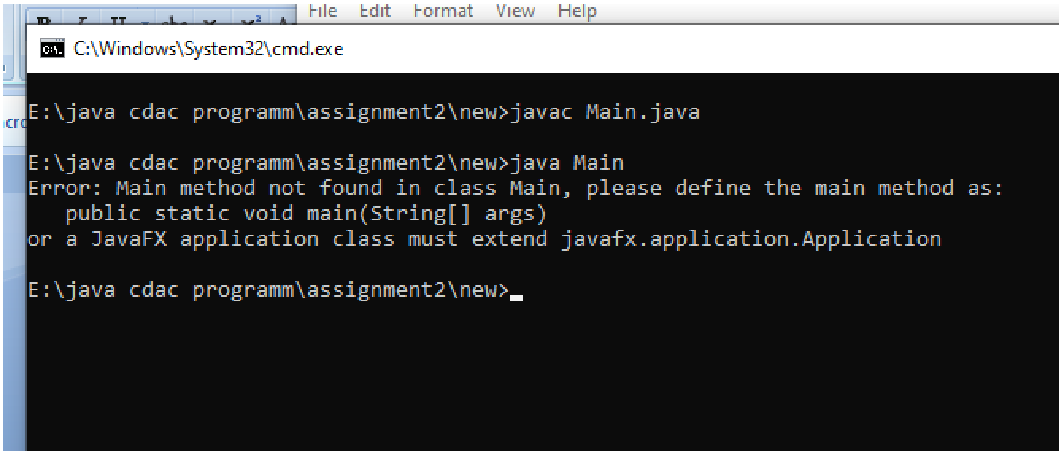
```
E:\java cdac programm\assignment2\new>javac Main.java

E:\java cdac programm\assignment2\new>java Main
Hello, World!

E:\java cdac programm\assignment2\new>
```

4.

```
public class Main {

  public static void main() {

     System.out.println("Hello, World!");

 }

}
```

Error

“String [] args is missing”

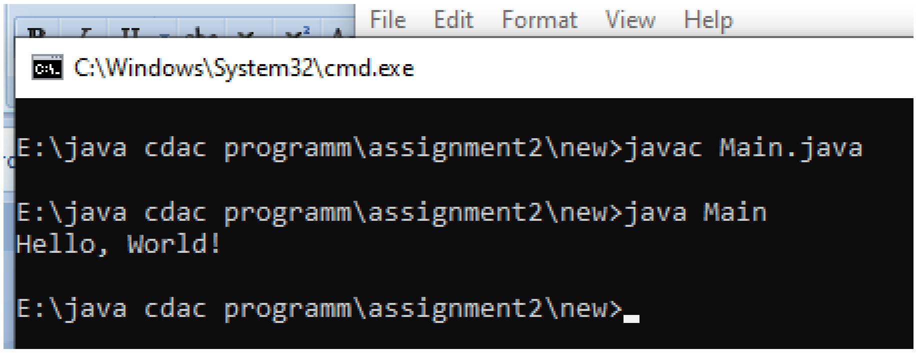


```
E:\java cdac programm\assignment2\new>javac Main.java

E:\java cdac programm\assignment2\new>java Main
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

E:\java cdac programm\assignment2\new>_
```

Correct code:

```
public class Main {

   public static void main(String[] args) {

       System.out.println("Hello, World!");

  }
}
```

Output:



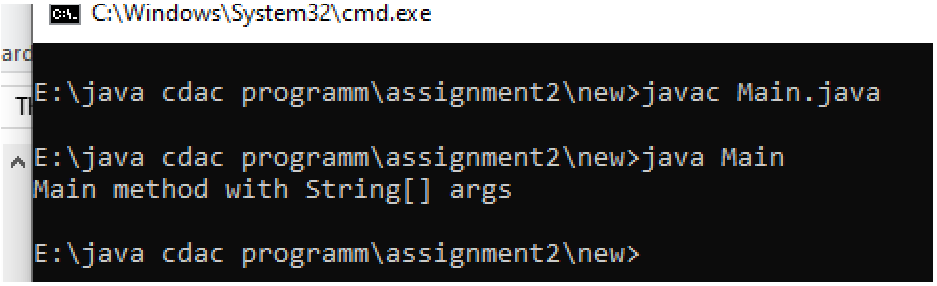
```
E:\java cdac programm\assignment2\new>javac Main.java

E:\java cdac programm\assignment2\new>java Main
Hello, World!

E:\java cdac programm\assignment2\new>_
```

5.

```
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 is not display but my observation is in any file is only one Main method is allowed and only this is executed. And write proper syntax.Correct syntax is **public static void main (String [] args)**

Output

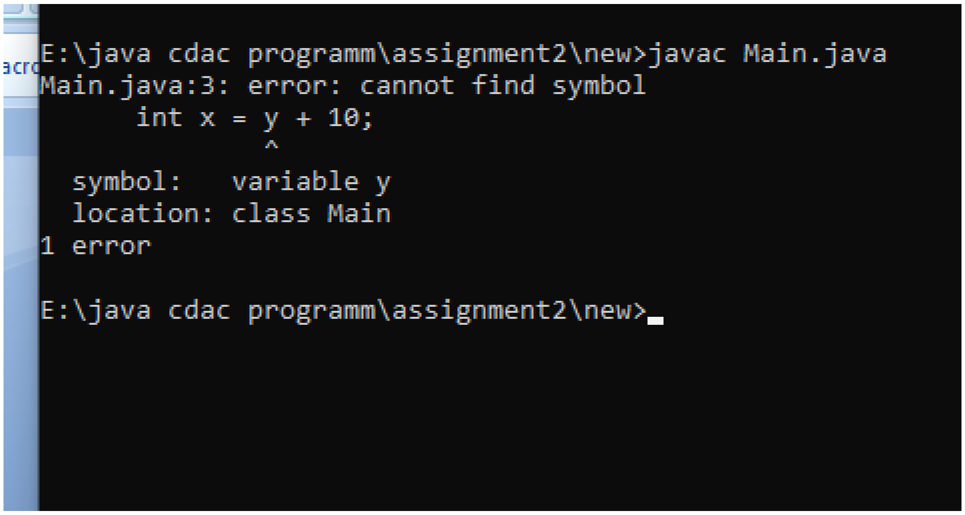


```
E:\java cdac programm\assignment2\new>javac Main.java

E:\java cdac programm\assignment2\new>java Main
Main method with String[] args

E:\java cdac programm\assignment2\new>
```

6.

```
public class Main {

 public static void main(String[] args) {

      int x = y + 10;

      System.out.println(x);

  }

}
```

Error



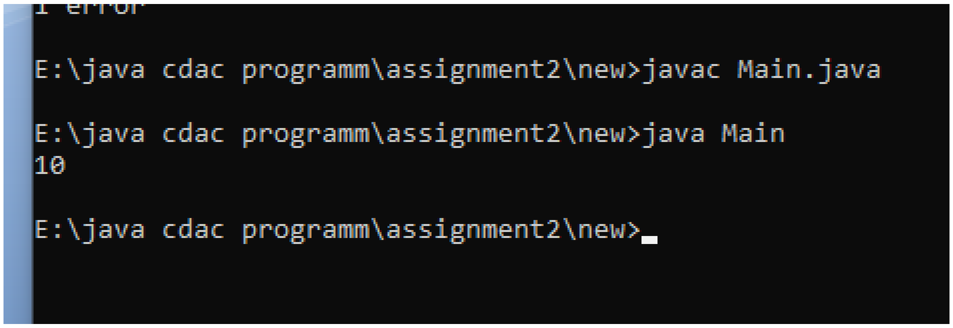
```
E:\java cdac programm\assignment2\new>javac Main.java
Main.java:3: error: cannot find symbol
      int x = y + 10;
              ^
  symbol:   variable y
  location: class Main
1 error

E:\java cdac programm\assignment2\new>
```

Variable declaration is imp in any programming languages because in java we don’t have default value of variables .

Correct code:

```
public class Main {

 public static void main(String[] args) {

      int y=0;

      int x = y + 10;

      System.out.println(x);

  }

}
```

Output:



```
1 error

E:\java cdac programm\assignment2\new>javac Main.java

E:\java cdac programm\assignment2\new>java Main
10

E:\java cdac programm\assignment2\new>_
```

7.

public class Main {

  public static void main(String[] args) {

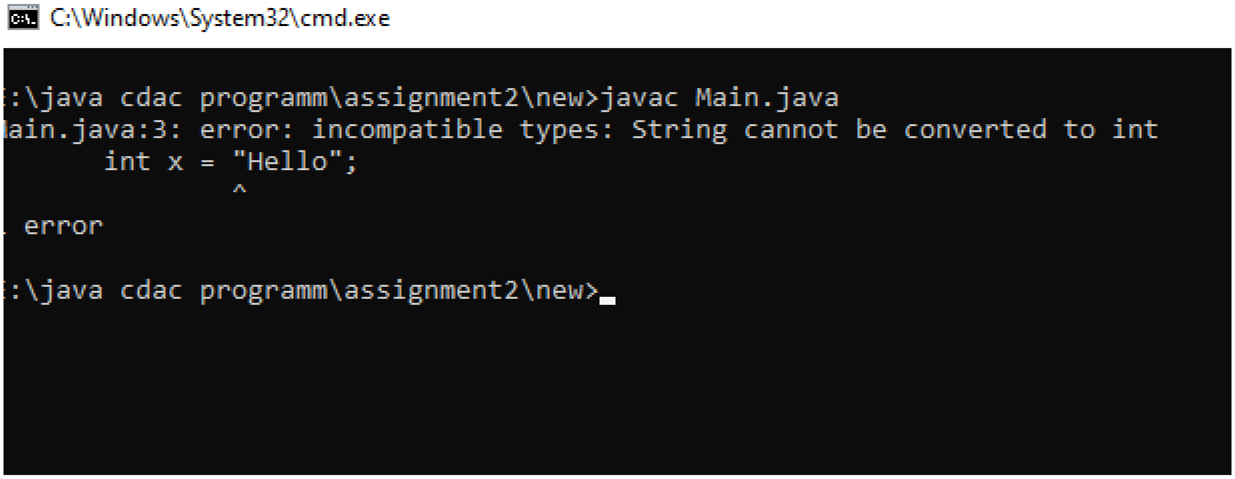
      int x = "Hello";

   System.out.println(x);

 }

 }

Error:



C:\Windows\System32\cmd.exe

```
:\java cdac programm\assignment2\new>javac Main.java
lain.java:3: error: incompatible types: String cannot be converted to int
      int x = "Hello";
              ^
 error

:\java cdac programm\assignment2\new>_
```

Hellow is a String and X Variable data type is int so we cannot convered string into int.

Correct Code:

public class Main {

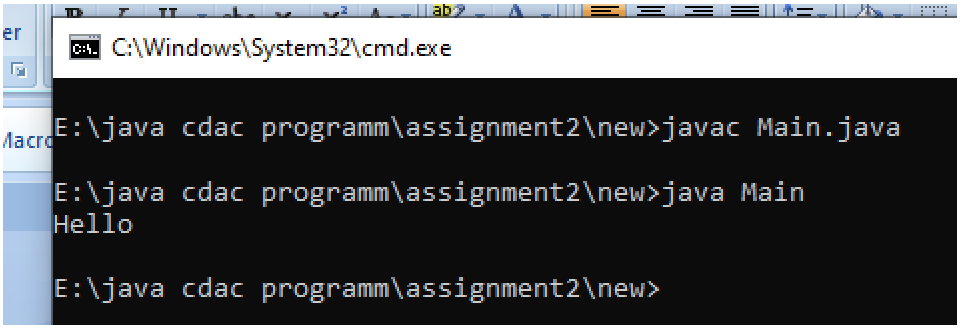
  public static void main(String[] args) {

      String x = "Hello";

   System.out.println(x);

```
 }

 }
```

Output:

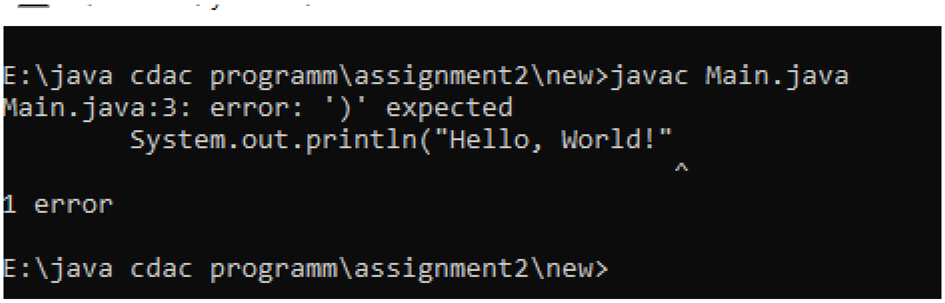


```
E:\java cdac programm\assignment2\new>javac Main.java

E:\java cdac programm\assignment2\new>java Main
Hello

E:\java cdac programm\assignment2\new>
```

8.

```
public class Main {

    public static void main(String[] args) {

        System.out.println("Hello, World!"

 }

}
```

Error:



```
E:\java cdac programm\assignment2\new>javac Main.java
Main.java:3: error: ')' expected
        System.out.println("Hello, World!"
                                          ^
1 error

E:\java cdac programm\assignment2\new>
```

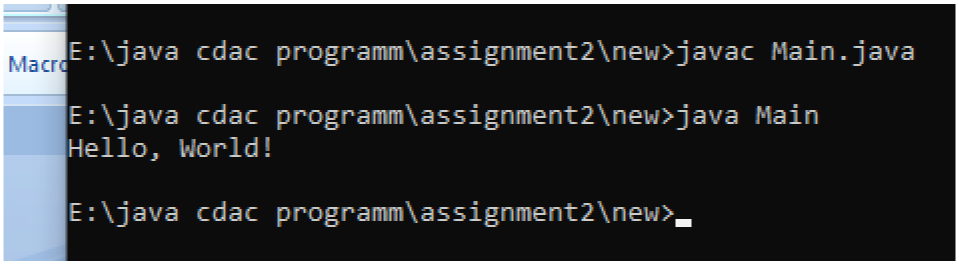
Solution Write proper syntax.

Correct code:

```
public class Main {

    public static void main(String[] args) {

        System.out.println("Hello, World!");

 }
```

}

Output:



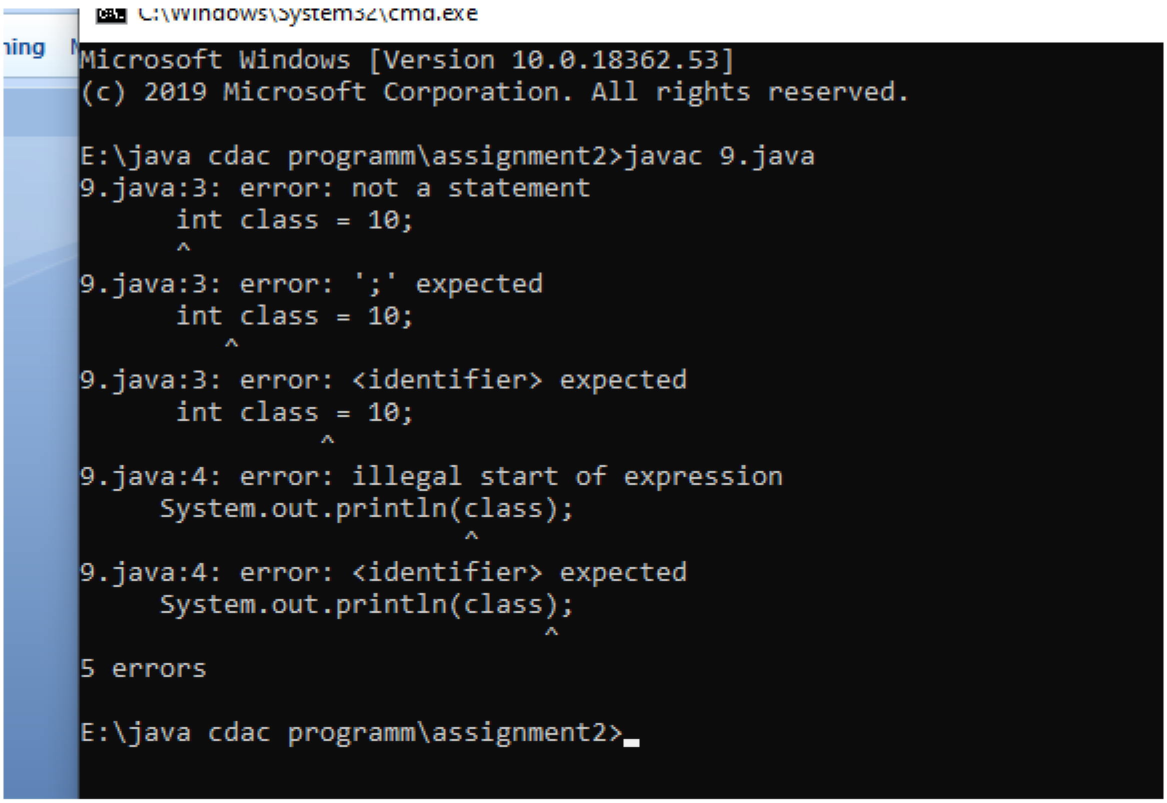
```
E:\java cdac programm\assignment2\new>javac Main.java

E:\java cdac programm\assignment2\new>java Main
Hello, World!

E:\java cdac programm\assignment2\new>_
```

9. public class Main {

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

What error occurs?

Ans :



```
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E:\java cdac programm\assignment2>javac 9.java
9.java:3: error: not a statement
      int class = 10;
      ^
9.java:3: error: ';' expected
      int class = 10;
         ^
9.java:3: error: <identifier> expected
      int class = 10;
               ^
9.java:4: error: illegal start of expression
     System.out.println(class);
                        ^
9.java:4: error: <identifier> expected
     System.out.println(class);
                             ^
5 errors

E:\java cdac programm\assignment2>_
```
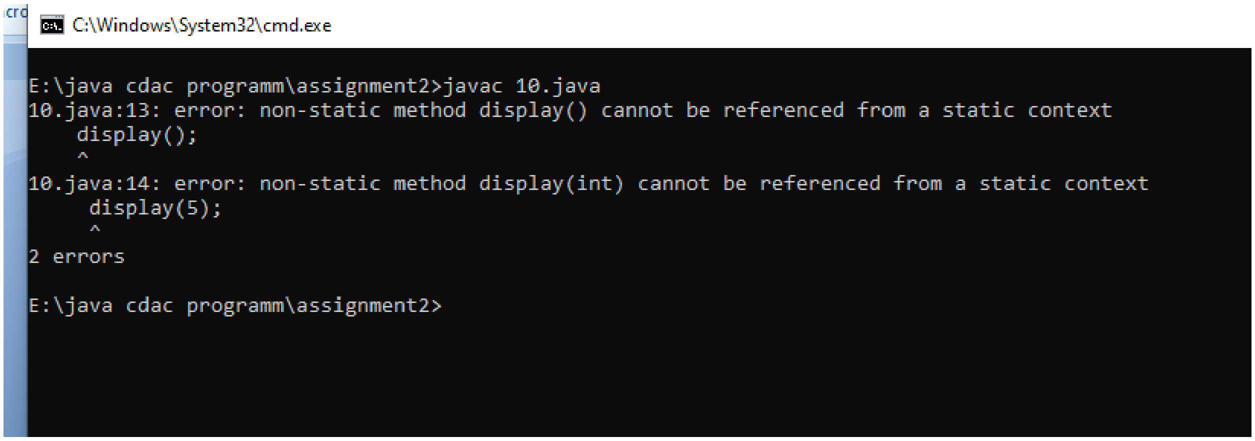

Q.Why can't reserved keywords be used as identifiers?

Because they already used by the syntax of the java programming language.

```
10. 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:



```
E:\java cdac programm\assignment2>javac 10.java
10.java:13: error: non-static method display() cannot be referenced from a static context
    display();
    ^
10.java:14: error: non-static method display(int) cannot be referenced from a static context
     display(5);
     ^
2 errors

E:\java cdac programm\assignment2>
```

Correct code:

```
        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();
   obj.display();
    obj.display(5);
  }
 }
```

Q.What happens when you compile and run this code?

Non static/instance variables are not allowed to access to use in static method means class object is creating is must.

```
E.g public static void main(String[] args) {
  Main obj = new Main();   //this is important
   obj.display();
    obj.display(5);
  }
 }
```

Q.Is method overloading allowed?

Yes allowed: **OVERLOADING MEANS :- SAME METHOD NAME BUT DIFFERENT DATA TYPES/SAME DATA TYPE BUT PARAMETERS ARE DIFFERENTS**

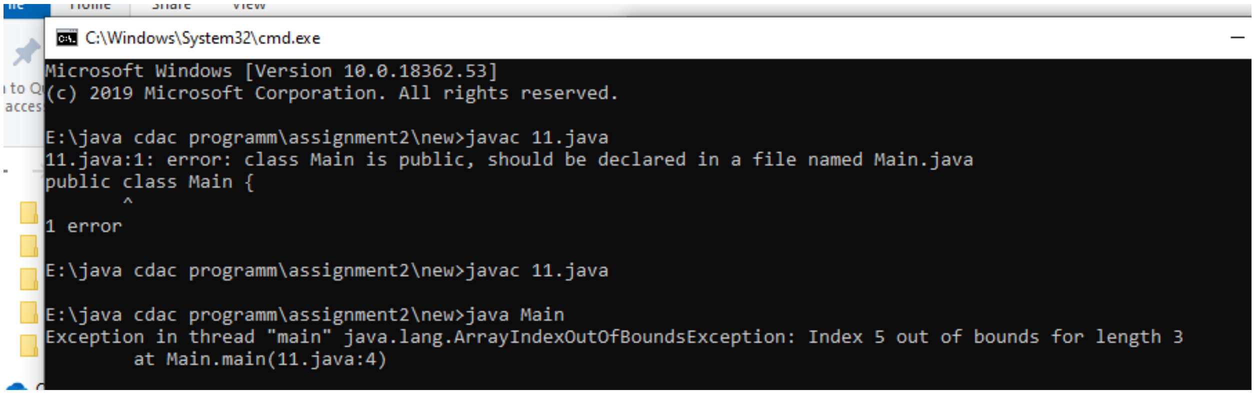
E.G void display(int num,int num);// this is same data type but different parameters.

Void display (String num);// this is different data type

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

 }

public void display(String num) {

  System.out.println("With parameter: " + num);

 }

public static void main(String[] args) {

  Main obj = new Main();

   obj.display();

    obj.display(5);

          obj.display("r");

  }

 }
```

Q11.
```
public class Main {

   public static void main(String[] args) {

       int[] arr = {1, 2, 3};

 System.out.println(arr[5]);

 }

}
```

Error :



```
Microsoft Windows [Version 10.0.18362.53]
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E:\java cdac programm\assignment2\new>javac 11.java
11.java:1: error: class Main is public, should be declared in a file named Main.java
public class Main {
       ^
1 error

E:\java cdac programm\assignment2\new>javac 11.java

E:\java cdac programm\assignment2\new>java Main
Exception in thread "main" java.lang.ArrayIndexOutOfBoundsException: Index 5 out of bounds for length 3
        at Main.main(11.java:4)
```

⍰ What runtime exception do you encounter? Why does it occur?

Because we are try to print out of boundaries array index value.

Means we are given array size =3 but try to print arr[5] value. That’s why given to runtime error.

Correct code:

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

12.

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

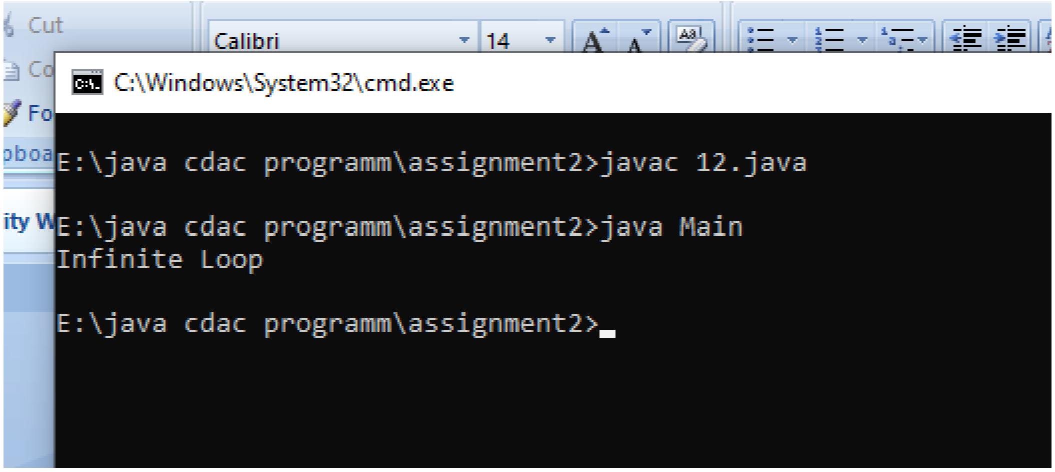
What happens when you run this code?

Ans : Program is go in infinite loop.

How can you avoid infinite loops?

Correct code:

```
  class Main {
   public static void main(String[] args) {
int a=1;
     while (a>=1) {
   System.out.println("Infinite Loop");
a--;
    }
  }
}
```

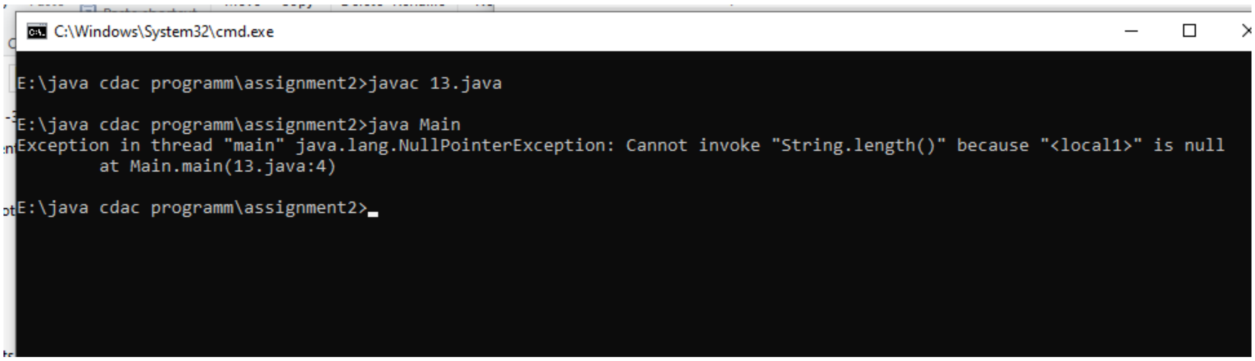


```
E:\java cdac programm\assignment2>javac 12.java

E:\java cdac programm\assignment2>java Main
Infinite Loop

E:\java cdac programm\assignment2>_
```

13.

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

Error :



```
E:\java cdac programm\assignment2>javac 13.java

E:\java cdac programm\assignment2>java Main
Exception in thread "main" java.lang.NullPointerException: Cannot invoke "String.length()" because "<local1>" is null
        at Main.main(13.java:4)

E:\java cdac programm\assignment2>_
```

⍰ What exception is thrown? Why does it occur?

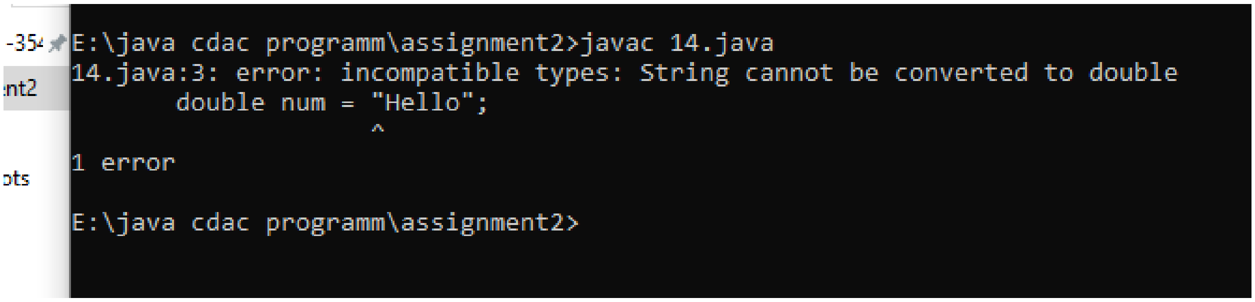
Expection is thrown: java.NullPointerException. because, String is given to “Null”. String is always given in “ “ this way.

14.

```
          public class Main {

   public static void main(String[] args) {

    double num = "Hello";

     System.out.println(num);

}

}
```

Error :

What compilation error occurs?



```
E:\java cdac programm\assignment2>javac 14.java
14.java:3: error: incompatible types: String cannot be converted to double
       double num = "Hello";
                    ^
1 error

E:\java cdac programm\assignment2>
```

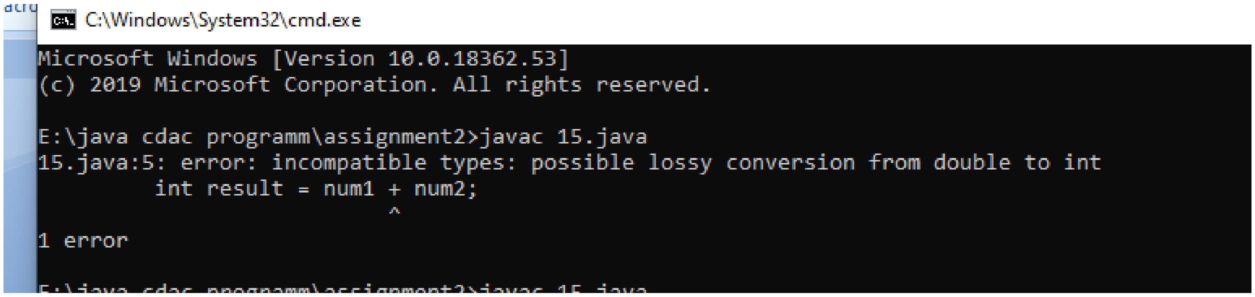
Why does Java enforce data type constraints?

Ans: To ensure it behaves as expected certain rules. Double data type have 8 byte date range and string has no range. And we are data type store less than given data type. E.g. (float to int/ int to float/double to int etc.)

Q.15 public class Main {

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

     int num1 = 10;

       double num2 = 5.5;

         int result = num1 + num2;

      System.out.println(result);

 }

}
```

What error occurs when compiling this code?



```
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E:\java cdac programm\assignment2>javac 15.java
15.java:5: error: incompatible types: possible lossy conversion from double to int
        int result = num1 + num2;
                          ^
1 error

E:\java cdac programm\assignment2>javac 15.java
```

We cannot convert/stored double into int data type.

How should you handle different data types in operations?

Using **TypeCasting** method.

E.g.int result = num1+(int)num2; OR

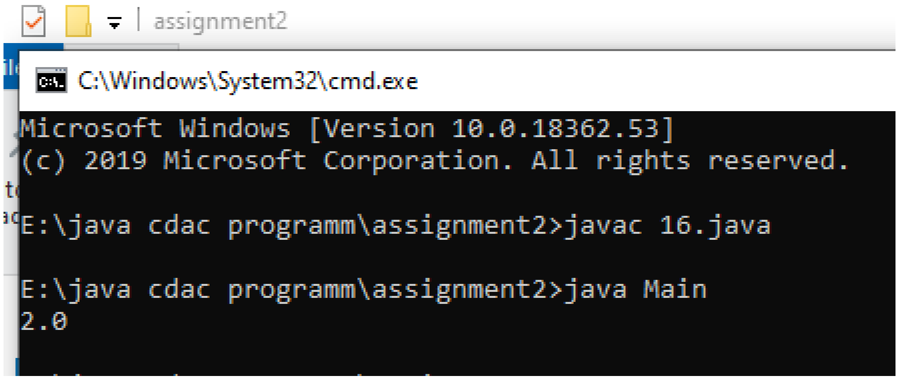
Double result= (double) num1+ num2;

Correct code

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

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

What is the result of this operation?



```
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E:\java cdac programm\assignment2>javac 16.java

E:\java cdac programm\assignment2>java Main
2.0
```
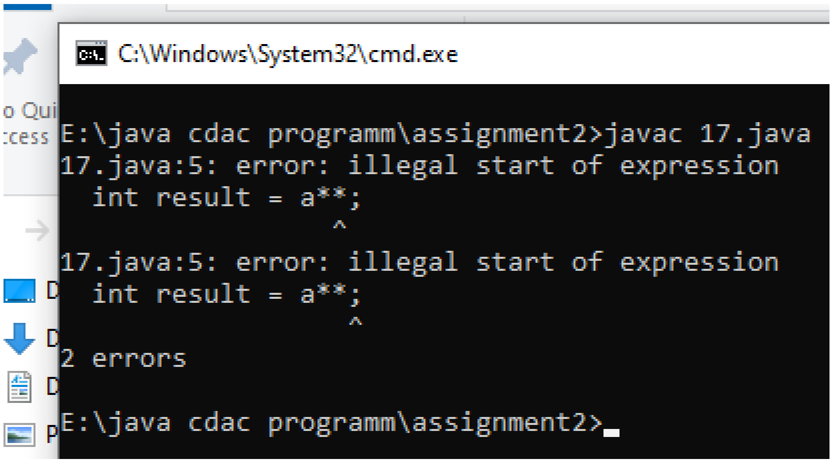

Is the output what you expected?

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

No: I was expected output is “**2.5”.**

17.
```
class Main {
public static void main(String[] args) {
int a = 10;
int b = 5;
int result = a**;
System.out.println(result);
  }
}
```

Error: What compilation error occurs?



```
E:\java cdac programm\assignment2>javac 17.java
17.java:5: error: illegal start of expression
  int result = a**;
                 ^
17.java:5: error: illegal start of expression
  int result = a**;
                  ^
2 errors

E:\java cdac programm\assignment2>_
```

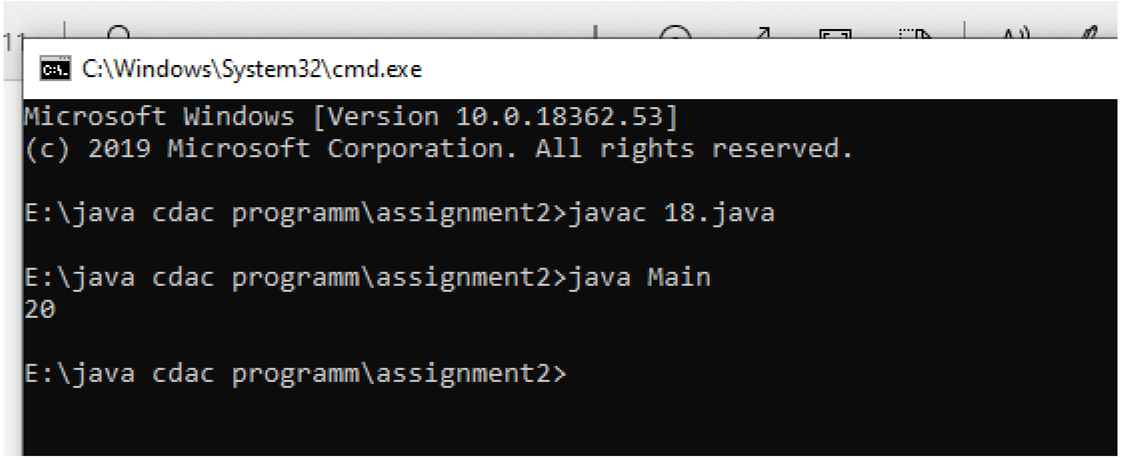
Why is the ** operator not valid in Java?

Because makers of Java thought to keep it simple by using Math.pow() utility class instead of **. We cannot write this.

```
18. class Main {

    public static void main(String[] args) {

        int a = 10;

        int b = 5;

       int result = a + b * 2;

      System.out.println(result);

  }

}
```

What is the output of this code?

Output:



```
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E:\java cdac programm\assignment2>javac 18.java

E:\java cdac programm\assignment2>java Main
20

E:\java cdac programm\assignment2>
```

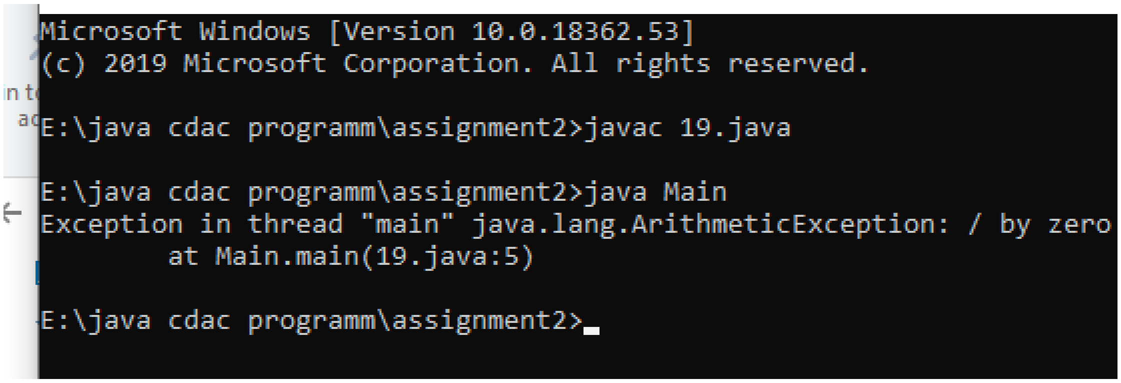
How does operator precedence affect the result?

In a + b * 2 equation “*” is high priority than “+” so left to right solve equation.

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

Error:

What runtime exception is thrown?



```
Microsoft Windows [Version 10.0.18362.53]
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E:\java cdac programm\assignment2>javac 19.java

E:\java cdac programm\assignment2>java Main
Exception in thread "main" java.lang.ArithmeticException: / by zero
        at Main.main(19.java:5)

E:\java cdac programm\assignment2>
```

Why does division by zero cause an issue in Java?

Ans:We cannot divide any nu by “0”.

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

What syntax error occurs?

In program line nu 3 semicolon is missing.

How does the missing semicolon affect compilation?

In any Programming language “Semicolon” means end of the line/statement. Which Is important. Because it is helps to computer know when one line or statement is end and another is beginning.

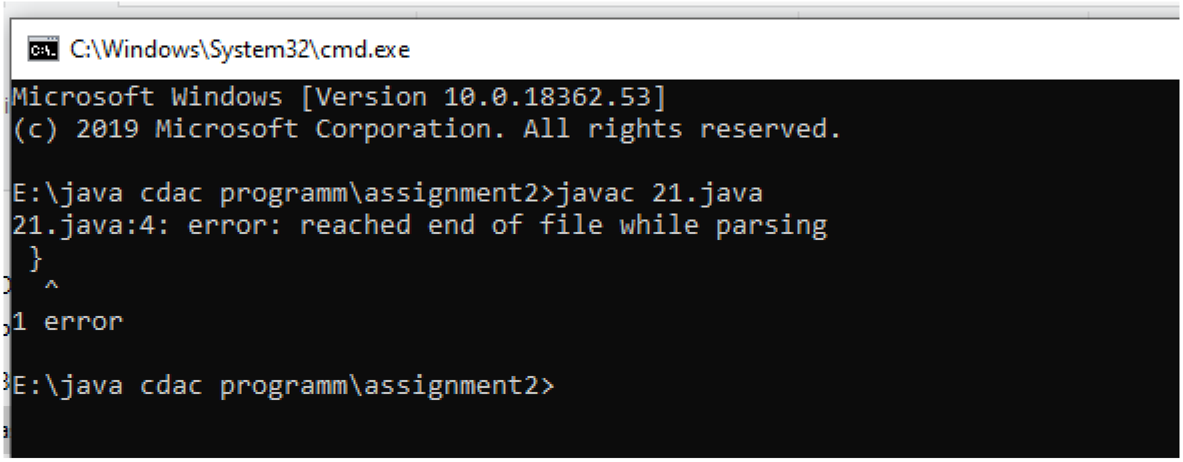
```
21. class Main {

   public static void main(String[] args) {

      System.out.println("Hello, World!");     // Missing closing brace here

 }
```

Error:



```
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E:\java cdac programm\assignment2>javac 21.java
21.java:4: error: reached end of file while parsing
 }
  ^
1 error

E:\java cdac programm\assignment2>
```
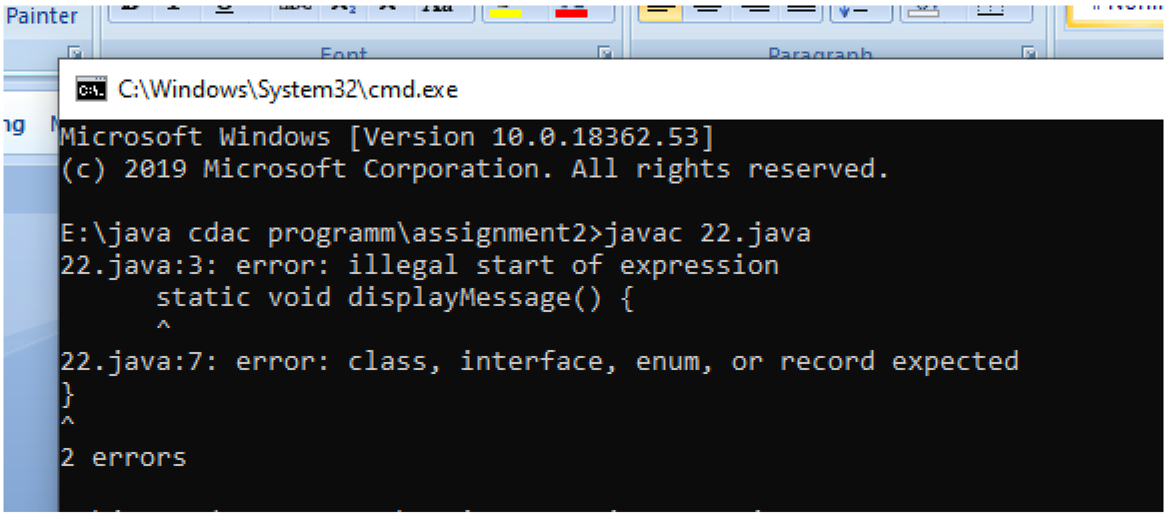

 What does the compiler say about mismatched braces?

In every program required to stat braces is and end braces is imp because it is defines scope of variables .constructor etc.

```
Q.22public class Main {

 public static void main(String[] args) {

   static void displayMessage() {

          System.out.println("Message");

     }

 }

 }
```

Error:

⍰ What syntax error occurs?



```
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E:\java cdac programm\assignment2>javac 22.java
22.java:3: error: illegal start of expression
      static void displayMessage() {
      ^
22.java:7: error: class, interface, enum, or record expected
}
^
2 errors
```

Can a method be declared inside another method?

No in java we cannot write any method into inside another method.

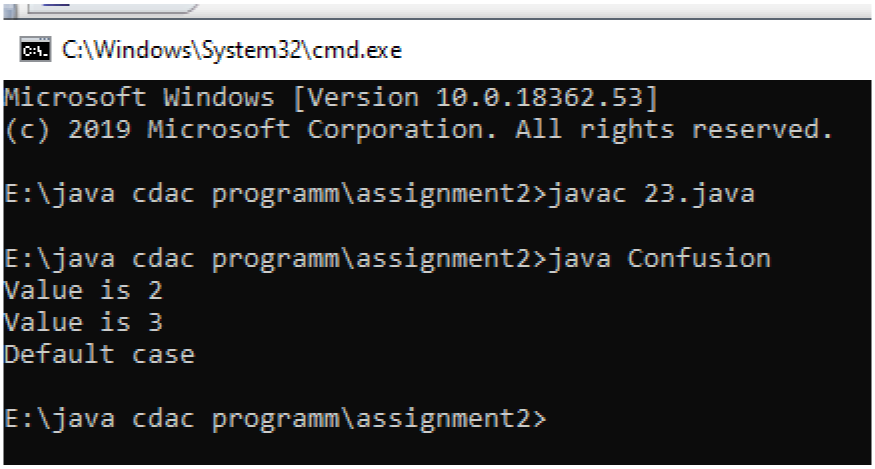
Correct program is

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

Q23.

```
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");

    }

  }

}
```

Output:



C:\Windows\System32\cmd.exe

```
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E:\java cdac programm\assignment2>javac 23.java

E:\java cdac programm\assignment2>java Confusion
Value is 2
Value is 3
Default case

E:\java cdac programm\assignment2>
```
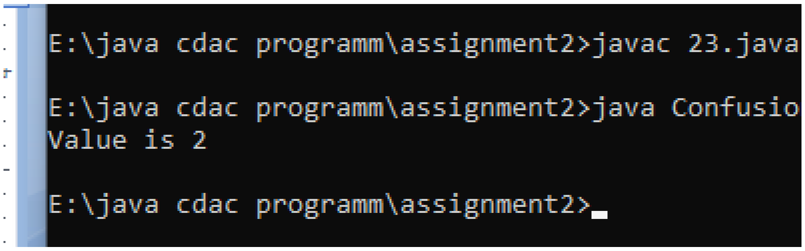

Why does the default case print after "Value is 2"?

Ans : because in program we cannot write **break;** statement.

How can you prevent the program from executing the default case?

Writing the break statement after every case statement.

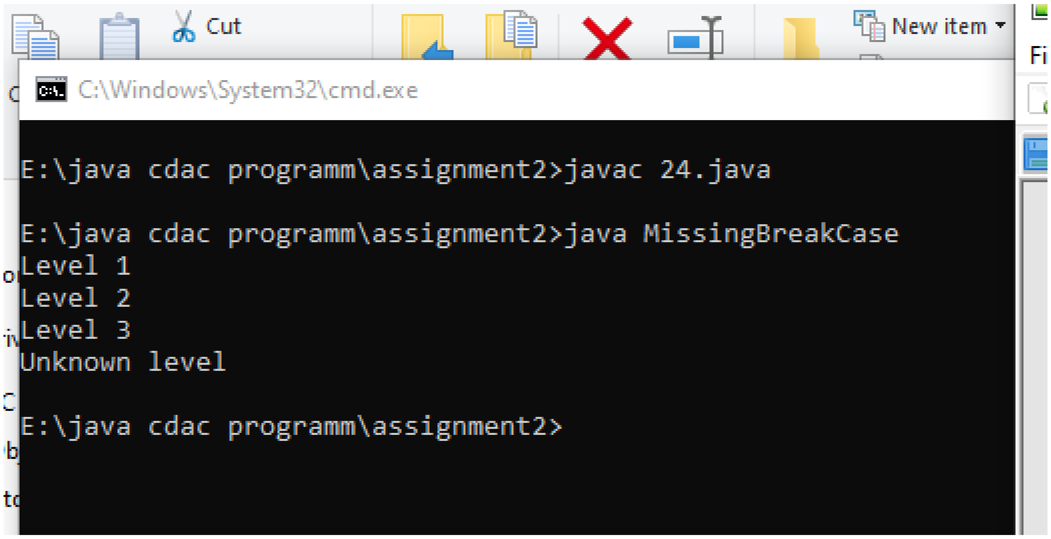


```
E:\java cdac programm\assignment2>javac 23.java

E:\java cdac programm\assignment2>java Confusio
Value is 2

E:\java cdac programm\assignment2>
```

Q.24

```
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");
                 }
                 }
                 }
```

Output:

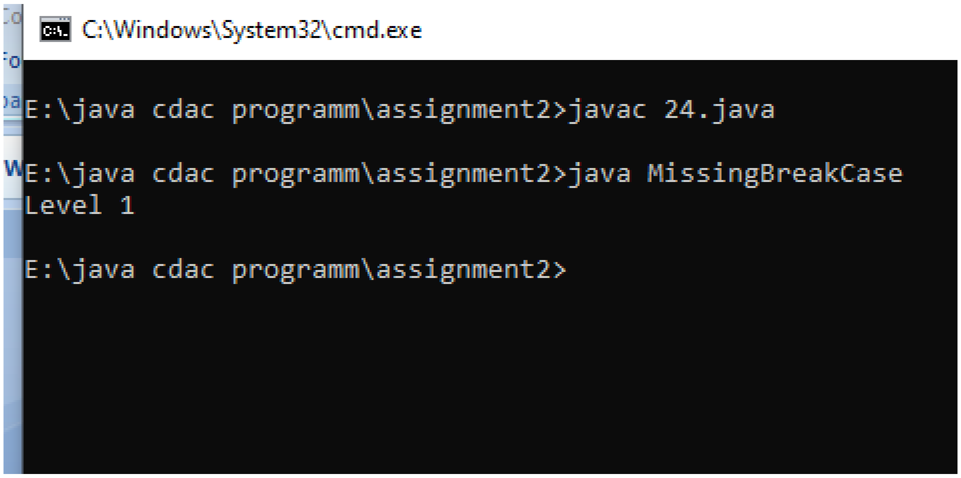


```
E:\java cdac programm\assignment2>javac 24.java

E:\java cdac programm\assignment2>java MissingBreakCase
Level 1
Level 2
Level 3
Unknown level

E:\java cdac programm\assignment2>
```

Correct code:

```
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");
                       break;
                       }
                       }
                       }
```

Output:



```
E:\java cdac programm\assignment2>javac 24.java

E:\java cdac programm\assignment2>java MissingBreakCase
Level 1

E:\java cdac programm\assignment2>
```

When level is 1, why does it print "Level 1", "Level 2", "Level 3", and "Unknown level"?

Break; statement is missing.

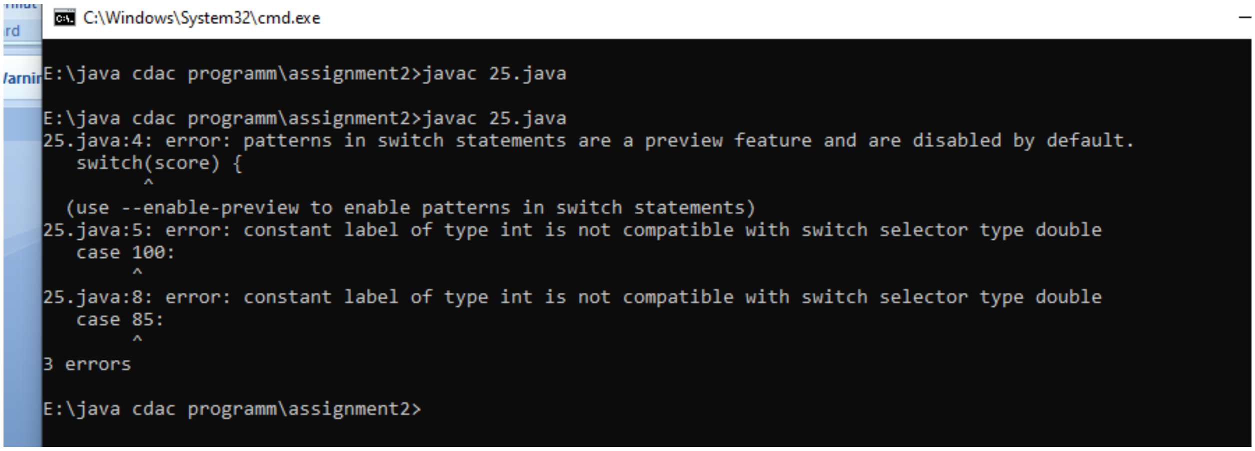
What is the role of the break statement in this situation?

Terminate/end the process of the particular case of the switch statement.

Q.25

```
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!");

  }

  }
}
```

Output:



```
E:\java cdac programm\assignment2>javac 25.java

E:\java cdac programm\assignment2>javac 25.java
25.java:4: error: patterns in switch statements are a preview feature and are disabled by default.
   switch(score) {
         ^
  (use --enable-preview to enable patterns in switch statements)
25.java:5: error: constant label of type int is not compatible with switch selector type double
   case 100:
        ^
25.java:8: error: constant label of type int is not compatible with switch selector type double
   case 85:
        ^
3 errors

E:\java cdac programm\assignment2>
```

Why does this code not compile?

Because in above program wrong data type is used .(Boolean,long,float,double data types are not allowed in switch cases.)

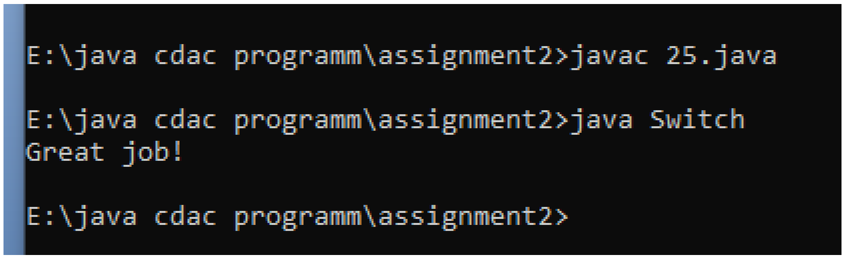
What does the error tell you about the types allowed in switch expressions?

In SWITCH statement only int, char string data types are allowed.

How can you modify the code to make it work?

```
class Switch {

   public static void main(String[] args) {

   int score = 85;

  switch(score) {

  case 100:

  System.out.println("Perfect score!");

  break;

  case 85:

  System.out.println("Great job!");

  break;

  default:

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

  }

  }
```

Output:

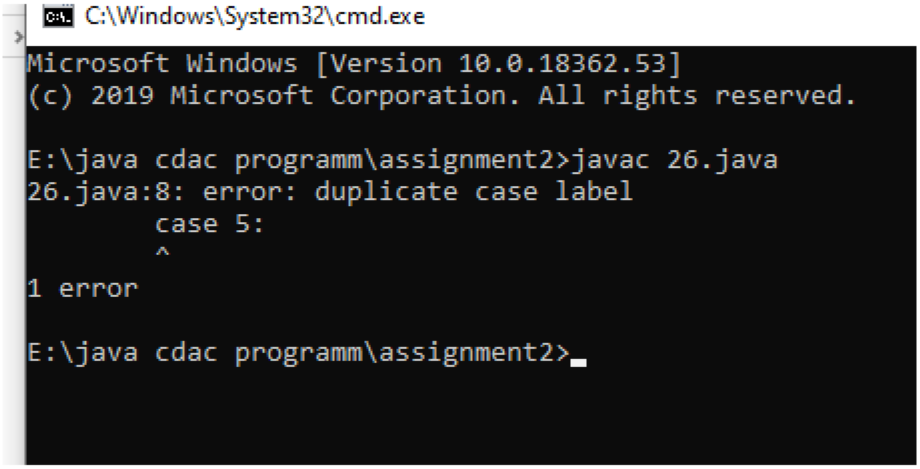


```
E:\java cdac programm\assignment2>javac 25.java

E:\java cdac programm\assignment2>java Switch
Great job!

E:\java cdac programm\assignment2>
```

Q26. 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");

                  }

                  }

                  }
```

Output



```
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E:\java cdac programm\assignment2>javac 26.java
26.java:8: error: duplicate case label
        case 5:
        ^
1 error

E:\java cdac programm\assignment2>
```

Why does the compiler complain about duplicate case labels?

Duplicate cases lables are not allowed is switch cases.

What happens when you have two identical case labels in the same switch block?

The second case will never executed.

SECTION2:

Question 1: Grade Classification

Write a program to classify student grades based on the following criteria:

- If the score is greater than or equal to 90, print "A"
- If the score is between 80 and 89, print "B"
- If the score is between 70 and 79, print "C"
- If the score is between 60 and 69, print "D"
- If the score is less than 60, print "F"

PROGRAM:

Question 2: Days of the Week

Write a program that uses a nested switch statement to print out the day of the week based on an integer input (1 for Monday, 2 for Tuesday, etc.). Additionally, within each day, print whether it is a weekday or weekend.

Program:

```
class week{
 public static void main(String args[]){
        int day=1;
  switch(day){
   case 1 :
                      System.out.println("Monday");
                      System.out.println("Weekday");
                      break;
     case 2 :
                      System.out.println("Thuesday");
                      System.out.println("weekday");
                      break;
     case 3 :
                      System.out.println("Wendsday");
                      System.out.println("Weekday");
                      break;

     case 4   :   System.out.println("Thursday");
                      System.out.println("Weekday");
                      break;

     case 5 :   System.out.println("Friday");
                      System.out.println("Weekday");
                      break;

     case 6 :    System.out.println("Saturday");
                      System.out.println("weekend");
                      break;

     case 7 :   System.out.println("Sunday");
                      System.out.println("Weekend");
                      break;

}
}
}
```

Question 3: Calculator

Write a program that acts as a simple calculator. It should accept two numbers and an operator (+, -, *, /) as input. Use a switch statement to perform the appropriate operation. Use nested if else to check if division by zero is attempted and display an error message.

Q4.

```
class Discount {

public static void main(String args[]){
Scanner sc = new Scanner(System.in);
System.out.println("Enter price ");
  int price =sc.nextInt();
```

```
    System.out.println("Enter 1 if membership present else 0");
int membership = sc.nextInt();
    if(price >=1000){
        if(membership==1){
            System.out.println("Discount is : " + ((price*25)/100));
        }else{
            System.out.println("Discount is : "+(price*20)/100);
        }
    }else if(price >=500 && price<=999){
        if(membership==1){
            System.out.println("Discount is : "+(price*15)/100);
        }else{
        System.out.println("Discount is : "+(price*10)/100);
    }
    }else{
        if(membership==1){
System.out.println("Discount is : "+(price*10)/100);
        }else{
        System.out.println("Discount is : "+(price*5)/100);
    }
    }
}
}
```