DECISION: IF, SWITCH

Decision

- Decision making structures have one or more conditions to be evaluated or tested by the program

loop	Description
if	An if statement consists of a boolean expression followed by one or more statements
switch	A switch statement allows a variable to be tested for equality against a list of values

if

```
import java.util.Scanner;

public class If_1 {
   public static void main(String[] args) {
      final Scanner scanner = new Scanner(System.in);

      final int testScore = scanner.nextInt();

      char grade = 'F';
      if ( testScore >= 90 ) {
         grade = 'A';
      }
      System.out.println("Grade = " + grade);

      scanner.close();
   }
}
```

if

```
import java.util.Scanner;

public class If_2 {
   public static void main(String[] args) {
      final Scanner scanner = new Scanner(System.in);

      final int testScore = scanner.nextInt();

      char grade;
      if ( testScore >= 90 ) {
         grade = 'A';
      }
      else {
         grade = 'F';
      }
      System.out.println("Grade = " + grade);

      scanner.close();
   }
}
```

if

```
public class If_3 {
   public static void main(String[] args) {
      final Scanner scanner = new Scanner(System.in);
      final int testScore = scanner.nextInt();

      char grade;
      if ( testScore >= 90 ) {
         grade = 'A';
      } else if ( testScore >= 80 ) {
         grade = 'B';
      } else if ( testScore >= 70 ) {
         grade = 'C';
      } else if ( testScore >= 60 ) {
         grade = 'D';
      } else {
         grade = 'F';
      }
      System.out.println("Grade = " + grade);
      scanner.close();
   }
}
```

```
public class If_4 {
   public static void main(String[] args) {
      final Scanner scanner = new Scanner(System.in);
      while ( true ) {
         final int testScore = scanner.nextInt();

         char grade;
         if ( testScore >= 90 ) {
            grade = 'A';
         } else if ( testScore >= 80 ) {
            grade = 'B';
         } else if ( testScore >= 70 ) {
            grade = 'C';
         } else if ( testScore >= 60 ) {
            grade = 'D';
         } else {
            grade = 'F';
         }
         System.out.println("Grade = " + grade);
         if ( grade == 'F' ) {
          System.out.println("BYE");
          break;
         }
      }
      scanner.close();
   }
}
```

```
public class If_5 {
 public static void main(String args[]) {
   final String message = "Java 8 !";
   for ( final char aChar : message.toCharArray() ) {
     final StringBuilder sb = new StringBuilder();
     sb.append(aChar + " : ");
     if ( Character.isDigit(aChar) )
       sb.append("digit.");
     else if ( Character.isLowerCase(aChar) )
       sb.append("lowercase.");
     else if ( Character.isUpperCase(aChar) )
       sb.append("uppercase.");
     else if ( Character.isWhitespace(aChar) )
       sb.append("whitespace.");
     else
       sb.append("neither alphanumeric nor whitespace.");
     System.out.println(sb.toString());
   }
 }
}
```

```
J : uppercase.
a : lowercase.
v : lowercase.
a : lowercase.
  : whitespace.
8 : digit.
  : whitespace.
!  : neither alphanumeric nor whitespace.
```

```
public class Switch_1 {
   public static void main(String[] args) {
        String monthStr = null;

        final int month = 8;
        switch (month) {
            case 1:  monthStr = "January"; break;
            case 2:  monthStr = "February"; break;
            case 3:  monthStr = "March"; break;
            case 4:  monthStr = "April"; break;
            case 5:  monthStr = "May"; break;
            case 6:  monthStr = "June"; break;
            case 7:  monthStr = "July"; break;
            case 8:  monthStr = "August"; break;
            case 9:  monthStr = "September"; break;
            case 10: monthStr = "October"; break;
            case 11: monthStr = "November"; break;
            case 12: monthStr = "December"; break;
            default: break;
        }
        System.out.println(monthStr); // August
    }
}
```

switch

```
import java.util.Arrays;
import java.util.List;

public class Switch_2 {
   public static void main(String[] args) {
      final String[] monthStrs = {"January", "February", "March", "April",
         "May", "June", "July", "August", "September", "October",
         "November", "December"};

      final int month = 8;

      System.out.println(monthStrs[month-1]); // August

      final List<String> monthList = Arrays.asList(monthStrs);
      System.out.println(monthList.get(month-1)); // August
    }
}
```

```
public class Switch_3 {
   public static void main(String[] args) {
        final List<String> futureMonths = new ArrayList<>();
        final int month = 8;
        switch (month) {
            case 1:  futureMonths.add("January");
            case 2:  futureMonths.add("February");
            case 3:  futureMonths.add("March");
            case 4:  futureMonths.add("April");
            case 5:  futureMonths.add("May");
            case 6:  futureMonths.add("June");
            case 7:  futureMonths.add("July");
            case 8:  futureMonths.add("August");
            case 9:  futureMonths.add("September");
            case 10: futureMonths.add("October");
            case 11: futureMonths.add("November");
            case 12: futureMonths.add("December");
                     break;
            default: break;
        }
        for ( final String monthName : futureMonths )
           System.out.println(monthName);
   }
}
```

```
August
September
October
November
December
```

String in Switch Case

- Since Java 7(2011), String is allowed in the expression of a switch statement

```
public class Switch_4 {
 public static void main(String[] args) {
   final String dayOfWeek = args[0];
   final String typeOfDay = getTypeOfDay(dayOfWeek);
   System.out.printf("%10s is %20s%n", dayOfWeek, typeOfDay);
 }
```

String in Switch Case

```
private static String getTypeOfDay(final String dayOfWeek) {
  String typeOfDay;
  switch ( dayOfWeek.toUpperCase() ) {
    case "MONDAY": typeOfDay = "Start of work week"; break;
    case "TUESDAY":
    case "WEDNESDAY":
    case "THURSDAY": typeOfDay = "Midweek"; break;
    case "FRIDAY": typeOfDay = "End of work week"; break;
    case "SATURDAY":
    case "SUNDAY": typeOfDay = "Weekend"; break;
    default:
      typeOfDay = "Invalid day of the week”;
      break;
  }
  return typeOfDay;
 }
}
```

```
import java.util.HashMap;
import java.util.Map;
public class Switch_5 {
 private static final Map<String, String> typeOfDayMap = new HashMap<>();

 static {
   typeOfDayMap.put("MONDAY", "Start of work week");
   typeOfDayMap.put("TUESDAY", "Midweek");
   typeOfDayMap.put("WEDNESDAY", "Midweek");
   typeOfDayMap.put("THURSDAY", "Midweek");
   typeOfDayMap.put("FRIDAY", "End of work week");
   typeOfDayMap.put("SATURDAY", "Weekend");
   typeOfDayMap.put("SUNDAY", "Weekend");
 }

 public static void main(String[] args) {
   final String dayOfWeek = args[0];
   final String typeOfDay = getTypeOfDay(dayOfWeek);
   System.out.printf("%10s is %20s%n", dayOfWeek, typeOfDay);
 }
 private static String getTypeOfDay(final String dayOfWeek) {
   final String typeOfDay = typeOfDayMap.get(dayOfWeek.toUpperCase());
   return ( typeOfDay != null ) ? typeOfDay : "Invalid day of the week";
 }
}
```