Seminar Session 2 (Selection) - Exercises

1. Write a program that reads in 2 integer values. Display one of the following messages:
   - "The 2 numbers are the same"
   - "The 2 numbers are not the same"

2. Write a Java program that determines whether an integer value input is even or odd.

3. Write a program that displays the price when a user signs up for a mobile phone plan. A string input "C" or "F" to indicate plan and an integer value for age. For 16 years old and below there is a 20% discount for any plan.

| Plan | Rate |
|---|---|
| Casual | $15 |
| Frequent | $28 |

4. Modify question 1 to display one of the following messages:
   "The 2 numbers are the same"
   "The first number is smaller"
   "The first number is bigger"

5. A subject has 2 assessment components – coursework and exam, both of equal weightage and each upon a total of 100 marks. The passing mark for each component is 40 marks. A pass grade is awarded only if a student passes both components and the average of the 2 must be at least 50 marks. Write a program that reads in 2 marks, representing the coursework and exam and displays an overall "Pass" or "Fail".

6. Modify the output of Q5 to display one of the following messages:
   - Pass
   - Fail. Average below 50
   - Fail Coursework
   - Fail Exam
   - Fail Coursework and Exam

7. (Written exercise)
   Write java expressions for the following. Use appropriate variable names.
   Example:
   To buy a HDB flats with at least 4 rooms and costing less than $500,000.
   Answer:

```
If ( numberOfRooms >= 4 &&  cost < 500000 )
    System.out.println("Buy flat");
```

   a. Children below 10 and senior citizens above 60 years old are charged half price. All others full price.

   b. Students with a score 80 and above will get distinction. Those with a score between 60 and 79 will get credit.

c. In quality control, all parts less than 7 mm long are rejected. So are those more than 9 mm long.

d. BCB bank offers a special 6% interest rate for senior citizen aged over 60 with bank accounts that have a balance over $1000.

8. (Written exercise.)
You are given the following variables and values:

```
boolean a = false;
boolean b = true;
int s = 5;
int t = 3;
double k = 2.02;
double m = 2.9;
```

What is the output of the following?

a. System.out.println( s <= 4.999 );

b. System.out.println( !(s <= k + m) );

c. System.out.println( ( m <= 9 ) || ( k <= t ) );

d. System.out.println( ! b && a );

e. System.out.println( (! a && k < 1.3 ));

f. System.out.println( ( t != s ) && ( k >= 4 ) );

g. System.out.println( ( s >= 3.0 ) || a );

h. System.out.println( a || b && s >= 3 );

i. System.out.println( ( a || b ) && s >= 3 );

9. Write a Java program that reads in an integer value representing the age of a person. The program displays one of the following messages depending on the age. Assume that the age provided will be a valid age from 0 to 99.

| Age | Message |
|---|---|
| Below 16 | Can watch PG movies |
| 16 and below 18 | Can watch NC16 movies |
| 18 and below 21 | Can watch M18 movies |
| 21 and above | Can watch RA movies |

10. Write a simple calculator program that performs arithmetic operation on 2 numbers. The program reads in 3 values in the following format:

```
Enter operator(+,-,*,/): +          (String)
Enter value1: 23                    (double)
Enter value2: 33                    (double)
```

Output will be as follows:

```
Result of 23+33=56
```

Use a switch statement.

11. Write a program called TriangleChecker that has the following specification:

a. Read in 3 values that represent the sides of a Triangle.

b. Check whether the 3 values can form a triangle. A triangle will not be possible if the sum of any two is less than or equal to the third. Display "The sides cannot form a triangle" if the 3 values cannot form a triangle.

c. If the values can form a triangle, display the type of triangle according to the table below.

| | |
|---|---|
| All 3 sides are equal | equilateral |
| Any two sides are equal | isoceles |
| All 3 are unequal | scalene |