//

IJSE

Institute of Software Engin

Graduate Diploma in Software Engineering

Batch - GDSE69

Module - Programming Fundamentals

Name : Shimara Appuhami

Nic : 200362310434

//
/

Assignment 04

1. What are the conditional statements used in Java and why are they important in Java Programming?

❖ The four conditional statements in Java are: if, if-else, else-if ladder, and switch. The 'if-else' statement executes different code based on whether the condition is true or false. The 'switch' statement evaluates an expression and executes the code corresponding to the matching case.

❖ Conditional statements in Java are programming constructs that allow you to control the flow of your program based on certain conditions. They enable you to make decisions and execute different blocks of code depending on whether a condition evaluates to true or false.

2. What are the advantages and disadvantages of using a switch statement over a series of if statements?

❖

if else switch	
The if else statement is used to decide between two options.	The switch statement is used to decide among multiple options.
if else statements follow a linear search approach to check conditions	switch statements follow a binary search approach to check conditions.
if else statements can compare values of all data types, including integer, float, string, character, etc.	Switch statements can only compare integer and character values.
In the if else statement, each condition is evaluated independently as they do not have a built-in fall through the property.	Switch statements have a built-in fall-through functionality. If a break statement is absent in a case block, the control directly jumps to the next condition, even if the condition does not return a true value.
If else can be used to check for complex conditions formed using the combination of relational operators.	Switch statements can only be used to check for the equality conditions.
We can use multiple conditions with one if else statement using logical operators.	In switch, a single case can check for only a single expression.

The provided conditions determine the values of an if else statement.

In a switch, the values depend on the preference of the user.

///

3. What is the purpose of the default case and break statement in a Java switch Statement?

❖ The switch expression is evaluated once.The value of the expression is compared with the values of each case.If there is a match, the associated block of code is executed.The break and default keywords are optional, and will be described later in this chapter ❖ **The break Keyword**

❖ When Java reaches a break keyword, it breaks out of the switch block. ❖ This will stop the execution of more code and case testing inside the block. ❖ When a match is found, and the job is done, it's time for a break. There is no need for more testing.

❖ **The default Keyword**

❖ The default keyword specifies some code to run if there is no case match: ❖ the default statement is used as the last statement in a switch block, it does not need a break.

///

4. Write a code segment that prints the value of an int variable k unless the value is less than 6.

❖ import java.util.*;
❖
❖ public class Main {
❖ public static void main(String args[]) {
❖ Scanner input= new Scanner (System.in);
❖ System.out.print("input number : ");
❖ int k=input.nextInt();
❖
❖ if(k<6){
❖ System.out.print("k = "+k);
❖ }
❖ }
❖ }

//
/////

5. Write a code segment that sets integer z to 1 if the integer w is less than or equal to 5 while integer x is not bigger than the difference between w and another integer y. Otherwise, set z to 0 if y is 0.

- ❖ import java.util.*;
- ❖
- ❖ public class Main {
- ❖ public static void main(String args[]) {
- ❖ int z=1;
- ❖ int w=0;
- ❖ int x=0;
- ❖ int y=0;
- ❖
- ❖ if(w<=5 && x<=(w-z)){
- ❖ z=0;
- ❖ }
- ❖ else
- ❖
- ❖ System.out.print(y==0);
- ❖ }
- ❖ }

//
/////

6. When a and b are two double variables, consider the following code segment.

```
 double tol= 1e-25;
double x = (a*b)/(b-a);
double y = Math.sqrt(a/b);
boolean p = Math.abs(a-b)/Math.max(a,b)>tol;
boolean q = (a>b)||(b>x);
if(p||q == y>x){
System.out.println("BLUE");
}else{
System.out.println("RED");
}
```

Give the ranges of values for a and b that cause the code segment to display both

"BLUE" and "RED". If no ranges can be found, explain why?

❖ the conditions are complex and depend on the values of a and b, as well as the value of tol. It's difficult to determine specific ranges for a and b that will simultaneously satisfy both "BLUE" and "RED" conditions. The outcome is likely to be very sensitive to the values of a and b, making it challenging to find a range of values that consistently satisfies both conditions.

//
/////

7. Write a statement that sets a String s to "Odd" if an integer k is an odd number and sets s to "Even" if k is even. Using:

a. an if-else statement.

❖ import java.util.*;
❖
❖ public class Main {
❖ public static void main(String args[]) { ❖ Scanner input= new Scanner (System.in); ❖ System.out.print("input number : "); ❖ int k=input.nextInt();
❖
❖ if(k%2==0){
❖
❖ System.out.println("even");
❖ }else{
❖ System.out.println("odd");
❖ }
❖
❖
❖ }
❖ }

b. a switch statement.

❖ import java.util.*;
❖
❖ public class Main {
❖ public static void main(String args[]) { ❖ Scanner input= new Scanner (System.in); ❖ System.out.print("input number : "); ❖ int k=input.nextInt();
❖
❖ switch(k%2){
❖

- ❖ case 0:
- ❖ System.out.println("even"); ❖ break;
- ❖ case 1:System.out.println("odd");
- ❖ break;
- ❖
- ❖ default:System.out.println("wrong input");
- ❖
- ❖ }
- ❖ }
- ❖ }

//
/////

8. Which data types are allowed in a Java switch statement?
- ❖ A switch works with the following primitive data types.
  - byte
  - short
  - char
  - int

//
/////

9. Assume that x and y are valid int variables. Consider the following code segment:

```
if(x!=y){
System.out.println("1");
}
if(x>y){
System.out.println("2");
}
if(x%y == 0){
System.out.println("3");
}
```
What is the output if x = 10, y = 5 ?
- ❖ 1
- ❖ 2
- ❖ 3

//
/////

10. Assume that p and q are valid boolean variables. Consider the following code

segment: if(p && q){

q = false;

}else{

if(!q)

System.out.println(p);

if(p == q)

System.out.println(p||q);

}

System.out.println(q);

What is the output if p = true, q = true ?

❖ false

///
/////

11. Assume that x, y and z are valid int variables. Consider the following code segment (note the poor indentations):

if(x>y||z>y)

System.out.println("1");

else

System.out.println("2");

if(Math.abs(x-y)>=z)

if(x>y)

System.out.println("3");

else

System.out.println("4");

else

System.out.println("5");

What is the output if x = 1, y = 3, z = 1?

❖ 2

❖ 4

///
/////

12. Convert the following code segments into a switch statement, when k contains an int value.

a. String cmd;

if(k==1){

cmd = "Edit";

}else if(k==2){

cmd = "Add";

}else if(k==3){

```java
cmd = "Quit";
}else{
cmd = "Invalid";
}
```

- ❖ import java.util.*;
- ❖
- ❖ public class Main {
- ❖ public static void main(String args[]) {
- ❖ Scanner input= new Scanner (System.in);
- ❖
- ❖ System.out.print("input number : ");
- ❖ int k=input.nextInt();
- ❖ String cmd;
- ❖ switch(k){
- ❖ case 1: cmd="Edit";
- ❖ System.out.print(cmd);
- ❖ break;
- ❖ case 2:cmd="Add";
- ❖ System.out.print(cmd);
- ❖ break;
- ❖ case 3:cmd="Quit";
- ❖ System.out.print(cmd);
- ❖ break;
- ❖ default:cmd="invalid";
- ❖ System.out.print(cmd);
- ❖
- ❖ }
- ❖ }
- ❖ }

```java
b. int p;
if(k==1||k==3){
p = 1;
}else if(k==2||k==4){
p = 2;
}else if(k==5){
p = 3;
}else{
p = 4;
}
```

```java
import java.util.*;

public class Main {
public static void main(String args[]) {
Scanner input= new Scanner (System.in);
System.out.print("input number : ");
int k=input.nextInt();
int p;
switch(k){
case 1:
case 3:
p=1;
System.out.print(p);
break;
case 2:
case 4:
p=2;
System.out.print(p);
break;
case 5:
p=3;
System.out.print(p);
break;
default:p=4;
System.out.print(p);

}
}
}
```

//
/////

13. What are the boolean values of p and q that make the output of the following code
segment true?
System.out.println(p!=q&&!p?p:q);

* boolean p=true;
* boolean q=true;
//
/////
14. Rewrite the following code segment using

a. ?: operator.
b. without using any conditional constructs.
(c contain a char value)

```
boolean p;
if(c=='a'){
p = true;
}else{
p = false;
}
```

❖ System.out.println(c=='a'?p=true:p=false);
❖

//
/////

15. Which of the following lines can be legally inserted at Line 10?
```
class Example{
public static void main(String[] args) {
int x = 10;
//Insert code here//Line 10
}
}
```
a. if(x){}
b. if(x=10){}
c. if(x==10){}
d. if(x=100!=10){}
e. if((x=100)!=10){}
f. if((x=100)>0==true){}

//
/////

16. Which of the following lines can be legally inserted at Line 10?
```
class Example{
public static void main(String[] args) {
int x = 10;
boolean b=true;
//Insert code here//Line 10
}
}
```

a. if(b){}

b. if(b=false){}

c. if(b==false){}

d. if(b=false==false){}

e. if((b=false)==false){}

f. if(b=(false==true)){}

///

/////

17. Write the outputs for the following code lines.

int x = 10;

a. System.out.println(x=9);

  ❖ x=9

b. System.out.println(x==9);

  ❖ false

c. System.out.println(x=9!=10);

  ❖ true(code line has error)

d. System.out.println((x=9)==10);

  ❖ false

e. System.out.println((x=9)<=10);

  ❖ true

///

/////

18. Write the outputs for the following code lines.

boolean b=true;

a. System.out.println(b);

  ❖ true

b. System.out.println(b=true);

  ❖ true

c. System.out.println(b==true);

  ❖ true

d. System.out.println(b!=true);

  ❖ false

e. System.out.println(b=true==true);

  ❖ true

f. System.out.println((b=true)==false);

  ❖ false

g. System.out.println(b=(true!=false));

  ❖ true

///

/////

19. Write the outputs for the following code lines.

```
int x=99;
if(x++==x){
System.out.println("x++==x : "+x);
}
x=99;
if(++x==x){
System.out.println("++x==x : "+x);

}
x=99;
if(x==x++){
System.out.println("x==x++ : "+x);
}
x=99;
if(x==++x){
System.out.println("x==++x : "+x);
}
x=99;
if(++x==++x){
System.out.println("++x==++x : "+x);
}
x=99;
if(x++==x++){
System.out.println("x++==x++ : "+x);
}
x=99;
if(++x==x++){
System.out.println("++x==x++ : "+x);
}
x=99;
if(x++==++x){
System.out.println("x++==++x : "+x);
}
```

- ❖ ++x==x : 100
- ❖ x==x++ : 100
- ❖ ++x==x++ : 101

//
/////

20. Given code fragment:

```
int x=9;
/*Insert code here */ { //Line 12
System.out.println("Success");
}
```

Which of the followings can be inserted at the Line 12 to get the output "Success"
a. if(x>=10)
b. if(x++>=10)
c. if(++x>=10)
d. if(++x>=x++)

e. if(++x>x++)
f. if(x++>=x++)
g. if(++x<=x++)
h. if(x<=x++)

//
/////

21. Write the outputs for the following code lines.

```
int x=99;
if(x++==x){
System.out.println("x++==x : "+x);
}
if(++x==x ){

System.out.println("++x==x : "+x);
}
if(x==x++){
System.out.println("x==x++ : "+x);
}
if(x==++x){
System.out.println("x==++x : "+x);
}
if(++x==++x){
System.out.println("++x==++x : "+x);
}
if(x++==x++){
System.out.println("x++==x++ : "+x);
}
if(++x==x++){
System.out.println("++x==x++ : "+x);
```

```
}
```

//
/////

22. Given code fragment:

```
int x=100,y=99;
/* Insert Code here*/ { //Line 12
System.out.println("Success");
}else{
System.out.println("Failed");
}
```

Which of the following lines can be inserted at the Line 12 to get the output as "Success"

a. if(x==y)
b. if(x++==++y)

c. if(x++==y++)
d. if(++x==y++)

//
/////

23. Write the outputs for the following code lines.

```
int x=99;
int y=99;
if(x++==y){
System.out.println("x++==y : "+x+" : "+y);
}
if(++x==y){
System.out.println("++x==y : "+x+" : "+y);
}
if(x==y++){
System.out.println("x==y++ : "+x+" : "+y);
}
if(x==++y){
System.out.println("x==++y : "+x+" : "+y);
}
if(++x==++y){
System.out.println("++x==++y : "+x+" : "+y);
}
if(x++==y++){
System.out.println("x++==y++ : "+x+" : "+y);
}
```

```
if(++x==y++){
System.out.println("++x==y++ : "+x+" : "+y);
}
if(x++==++y){
System.out.println("x++==++y : "+x+" : "+y);
}
```

❖ x++==y : 100 : 99
❖ x==++y : 101 : 101
❖ ++x==++y : 102 : 102
❖ x++==y++ : 103 : 103

///
/////

24. Assume that i = 1, j = 2, k = 3 and m = 2. What does each of the following statements print?
a. System.out.println(i ==1); //Line 1
b. System.out.println(j ==3); //Line 2
c. System.out.println((i >=1) && (j <4)); //Line 3
d. System.out.println((m <=99) & (k < m)); //Line 4
e. System.out.println((j >= i) || (k == m)); //Line 5
f. System.out.println((k + m < j)|(3- j>= k)); //Line 6
g. System.out.println(!(k > m)); //Line 7

❖ true
❖ false
❖ true
❖ false
❖ true
❖ false
❖ false

///
/////

25. What are the outputs of the following commands?
int x=20,y=60;
boolean bool;
a. System.out.println(x=10); //Line 1
b. System.out.println(bool=true); //Line 2
c. System.out.println(x=10>0); //Line 3

d. System.out.println((x=10)>0); //Line 4

e. System.out.println(bool=(x=10)>0); //Line 5

f. System.out.println(bool=x+y>100); //Line 6

- ❖ 10
- ❖ true
- ❖ error
- ❖ true
- ❖ true
- ❖ false

//
/////

26. What are the outputs of the following commands?

byte b = 10;

short s = 100;

int x = 125;

long l = 15000;

float f = 1.5f;

double d = 21.231;

char c = 'c';

boolean bool = 10>9;

a. System.out.println(b+s+x+""+f+d+c+bool); //Line 1

b. System.out.println(""+b+s+x+f+d+c+bool); //Line 2

c. System.out.println(b+s+x+f+d+c+""+bool); //Line 3

d. System.out.println(b+s+x+f+d+c+bool+""); //Line 4

e. System.out.println(bool+b+f+d+c+""+x+l); //Line 5

- ❖ 2351.521.231ctrue
- ❖ 101001251.521.231ctrue
- ❖ 356.731true
- ❖ Compile error
- ❖ Compile error

//
/////

27. Given:

class Example{

public static void main(String args[]){

//Line 5

switch(x){

```
default : System.out.print("4 ");
case 1 : System.out.print("1 ");
case 2 : System.out.print("2 ");
case 3 : System.out.print("3 ");
}
}
}
```

What will be the outputs when you insert the following codes at Line 5?
a. int x=1;
    ❖ 1 2 3
b. int x=2;
    ❖ 2 3
c. int x=3;
    ❖ 3
d. int x=4;
    ❖ 4 1 2 3
e. int x=0;
    ❖ 4 1 2 3
f. int x=5;
    ❖ 4 1 2 3

//
/////
28. Given:
```
class Example{
 public static void main(String args[]){
//Line 5
switch(x){
default : System.out.print("4 ");break;
case 2 : System.out.print("2 ");
case 3 : System.out.print("3 ");
case 1 : System.out.print("1 ");break;
}
}
}
```
What will be the outputs when you insert the following codes at Line 5?
a. int x=1;
    ❖ 1
b. int x=2;
    ❖ 2 3 1
c. int x=3;

❖ 3 1

d. int x=4;

    ❖ 4

e. int x=0;

    ❖ 4

f. int x=5;

    ❖ 4

//
/////

29. Which of the following code fragments can be inserted at Line 10 to make Line 12 valid?

final int x=100;

final int y;

y=100;

int z=100;

int a;

//Insert code here //Line 10

System.out.println(a); //Line 12

a. if(x>0){a=0;}

b. a=0;

c. if(y>0){a=0;}

d. if(z>0){a=0;}

e. if(true){a=0;}

f. if(y>0){a=0;}else {a=-1;}

g. a=z>0?0:-1;

//
/////

30. What values for n will cause the output of the fragment below to be "not interesting"?

System.out.println("Enter an integer: ");

int n = scan.nextInt();

if (n < 10)

System.out.println("less than 10");

else if (n > 5)

System.out.println("greater than 5");

else

System.out.println("not interesting");

    ❖ import java.util.*;

- ❖
- ❖ public class Main {
- ❖ public static void main(String args[]) {
- ❖ Scanner scan=new Scanner(System.in);
- ❖
- ❖ System.out.println("Enter an integer: ");
- ❖ int n = scan.nextInt();
- ❖ if (n <10 && n>0){
- ❖ System.out.println("less than 10");
- ❖ }else if (n > 5){
- ❖ System.out.println("greater than 5");
- ❖ }else{
- ❖ System.out.println("not interesting");
- ❖ }
- ❖ }
- ❖ }

///
/////

31. Which of the following lines are legal?
```
import java.util.*;
class Example{
public static void main(String args[]){
int x=100;
System.out.println(x); //Line 1
{
int y=200;
{
int z=300;
System.out.println(x); //Line 2
System.out.println(y); //Line 3
System.out.println(z); //Line 4
}
System.out.println(x); //Line 5
System.out.println(y); //Line 6
System.out.println(z); //Line 7
}
System.out.println(x); //Line 8
System.out.println(y); //Line 9
System.out.println(z); //Line 10
}
```

}
a. Line 1
b. Line 2
c. Line 3
d. Line 4

e. Line 5
f. Line 6
g. Line 7
h. Line 8

i. Line 9
j. Line 10
//
/////

32. Given Code:
class Example{
public static void main(String args[]){
int a=-5;
int b=-2;
a%=b;
a/=b;
b=a>0?0:a;
System.out.println(a+" "+b);
}
}
Select one option?
a. Prints 1 0
b. Prints -1 -1
c. Prints -2 -2
d. Prints 0 0

//
/////

33. Given:
//Insert code here //line 4
switch(x){
case 'A' : System.out.println("65 ");break;
case 'B' : System.out.println("66 ");break;

case 'C' : System.out.println("67 ");break;
default : System.out.println("wrong ");
}
Which of the following codes can be inserted legally at Line 4?
a. char x='A';
b. int x=65;
c. int x=65536;
d. byte x=65;
e. boolean x =true;
f. String x="A"; (since jdk 7)
g. double x=65.0;
h. short x=66 ;
///
/////

34. Given:
class Example {
public static void main(String[] args) {
int a = 2;
char b,c,d;
b = (a < 2) ? 'f' : 'g';
if (a < 2) c = 'h'; else c = 'i';
if (a < 2) d = 'j';
if (a > 2) d = 'k';
if (a == 2) d = 'l';
System.out.print(b + "," + c + "," + d);
}
}
What is the result of attempting to compile and run the program?
a. Prints: g, i, l
b. Compiler Error: variable b might not have been initialized.
c. Compiler Error: variable c might not have been initialized.
d. Compiler Error: variable d might not have been initialized.
e. Runtime Exception
f. None of the above.
///
/////

35. Remove all the unnecessary tests from the nested conditional statement below.
float income;
Scanner scanner = new Scanner(System.in);
System.out.println("Enter your monthly income: ");

```
income = scan.nextFloat();
if (income < 0.0)
System.out.println("You are going further into debt every month.");
else if (income >= 0.0 && income < 1200.00)
System.out.println("You are living below the poverty line.");
else if (income >= 1200.00 && income < 2500.00)
System.out.println("You are living in moderate comfort.");
else if (income >= 2500.00)
System.out.println("You are well off.");
```

- ❖ import java.util.*;
- ❖ class Main{
- ❖ public static void main(String args[]){
- ❖ float income;
- ❖ Scanner scanner = new Scanner(System.in);
- ❖ System.out.println("Enter your monthly income: ");
- ❖ income = scanner.nextFloat();
- ❖ if (income < 0.0)
- ❖ System.out.println("You are going further into debt every month.");
- ❖ else if (income >= 0.0 && income < 1200.00)
- ❖ System.out.println("You are living below the poverty line.");
- ❖ else if (income >= 1200.00 && income < 2500.00)
- ❖ System.out.println("You are living in moderate comfort.");
- ❖ else
- ❖ System.out.println("You are well off.");
- ❖ }
- ❖ }

///
/////

36. Given:
```
class Example{
public static void main(String args[]){
int a=1;
final int b=2;
final int c;
c=3;
final char d='A';
final char e='B';
int x=1;
switch(x){
case 65: System.out.print("65");
```

//Insert code//Line 10
}
}
}
Which of the following codes can be inserted legally at Line 10?
a. case a:
b. case b:
c. case c:
d. case e:
e. case f:
f. case 'A':
g. case 1.0:
h. case (char)66 :
///
/////

37. What is the output when the following code fragment is executed?
int found = 0, count = 5;
if (!found || --count == 0);
System.out.println("danger");
System.out.println("count = " + count);

❖ if (!found || --count == 0) Not a statement
❖ error

///
/////
38. Given Code fragment:
Scanner input=new Scanner(System.in);
System.out.print("Input student average : ");
double avg=input.nextDouble();
if(avg>=50){
System.out.println("Pass");
}else{
System.out.println("Fail");
}
System.out.println("Thanking you..");
What are outputs for the following inputs?
a. 99
❖ Pass
❖ Thanking you..

b. 75
  ❖ Pass
  ❖ Thanking you..

c. 49.99
  ❖ Fail
  ❖ Thanking you..

d. 50.01
  ❖ Pass
  ❖ Thanking you..

e. 50.0
  ❖ Pass
  ❖ Thanking you..

f. 25
  ❖ Fail
  ❖ Thanking you..

g. 49.0
  ❖ Fail
  ❖ Thanking you..

///
/////

39. What are the outputs of the following code segment when k = 0, 1, 2, 3, 4.

```
switch (k){
case 1:
System.out.println("A");
case 2: case 3:
System.out.println("B");
 break;
case 4:
System.out.println("C");
default:
System.out.println("D");

}
```

0
  - ❖ D
1
  - ❖ A
  - ❖ B
2
  - ❖ B
3
  - ❖ B
4
  - ❖ CD

///
/////

40. Write a Java program to test if a number is positive, negative or zero.

  - ❖ import java.util.*;
  - ❖ class Main{
  - ❖ public static void main(String args[]){
  - ❖
  - ❖ Scanner input= new Scanner (System.in);
  - ❖ System.out.print("input number : ");
  - ❖ int num=input.nextInt();
  - ❖ if (num>0){
  - ❖ System.out.print("positive number");
  - ❖ }else if (num<0){
  - ❖ System.out.print("negative number");
  - ❖
  - ❖ }else{
  - ❖ System.out.print("zero ");
  - ❖ }
  - ❖ }
  - ❖ }

///
/////

41. Write a Java program that determines whether a given character is a vowel or a Consonant

  - ❖ import java.util.*;

```
❖ class Main{
❖ public static void main(String args[]){
❖ Scanner input=new Scanner(System.in);
❖ char ch = input.nextLine();
❖
❖
❖ if(ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u' )
❖ System.out.println(ch + " is vowel");
❖ else
❖ System.out.println(ch + " is consonant");
❖
❖ }
❖ }
```

///
/////

42. Write a Java program to check whether the given integer is a multiple of both 7 and 8.

```
❖ import java.util.*;
❖ class Main{
❖ public static void main(String args[]){
❖
❖
❖ Scanner scanner = new Scanner(System.in);
❖ System.out.print("Enter an integer: ");
❖ int number = scanner.nextInt();
❖
❖ if (number % 7 == 0 && number % 8 == 0) {
❖ System.out.println(number + " is a multiple of both 7 and 8.");
❖ } else {
❖ System.out.println(number + " is not a multiple of both 7 and 8.");  ❖ }
❖
❖
❖ }
❖ }
```

///
/////

43. Write a Java program that takes two numbers as input from the user and compares them. The program should display whether the two numbers are equal, if one is greater than the other, or if one is less than the other.

```java
import java.util.*;
class Main{
public static void main(String args[]){

Scanner scanner = new Scanner(System.in);

System.out.print("Enter the first number: ");
double number1 = scanner.nextDouble();

System.out.print("Enter the second number: ");
double number2 = scanner.nextDouble();

if (number1 == number2) {
System.out.println("Both numbers are equal.");
} else if (number1 > number2) {
System.out.println("The first number is greater than the second number.");  }
else {
System.out.println("The first number is less than the second number.");  }


}
}
```

//
/////

44. Write a java program that accepts three numbers from the user and check if numbers are in "increasing" or "decreasing" order.

```java
import java.util.*;
class Main{
public static void main(String args[]){

System.out.print("Enter first number: ");
double number1 = scanner.nextDouble();

System.out.print("Enter second number: ");
double number2 = scanner.nextDouble();

System.out.print("Enter third number: ");
double number3 = scanner.nextDouble();

```

- ❖ if (number1 < number2 && number2 < number3) {
- ❖ System.out.println("The numbers are in increasing order.");
- ❖ } else if (number1 > number2 && number2 > number3) {
- ❖ System.out.println("The numbers are in decreasing order.");
- ❖ } else {
- ❖ System.out.println("The numbers are not in strictly increasing or decreasing order.");
- ❖ }
- ❖ }
- ❖ }

//
/////

45. Write a java program to find the absolute number of a given integer number.
- ❖ import java.util.*;
- ❖ class Main{
- ❖ public static void main(String args[]){
- ❖ Scanner scanner = new Scanner(System.in);
- ❖
- ❖ System.out.print("Enter number: ");
- ❖ int number = scanner.nextInt();
- ❖
- ❖ int absoluteValue;
- ❖
- ❖ if (number < 0) {
- ❖ absoluteValue = -number;
- ❖ } else {
- ❖ absoluteValue = number;
- ❖ }
- ❖
- ❖ System.out.println("The absolute value " + number + " is " + absoluteValue); ❖
- ❖
- ❖ }
- ❖ }

//
/////

46. Enter marks Obtained by a student for Chemistry,Physics and Combined maths. Calculate the total and average. If the average is greater than 75 then display "Pass"

otherwise "Fail". Write a java program to perform the above task.

- ❖ import java.util.*;
- ❖ class Main{
- ❖ public static void main(String args[]){
- ❖
- ❖ Scanner scanner = new Scanner(System.in);
- ❖
- ❖ System.out.print("Enter marks Chemistry: ");
- ❖ double chemistry = scanner.nextDouble();
- ❖
- ❖ System.out.print("Enter marks Physics: ");
- ❖ double physics = scanner.nextDouble();
- ❖
- ❖ System.out.print("Enter marks Combined Maths: ");
- ❖ double maths = scanner.nextDouble();
- ❖
- ❖ double totalMarks = chemistry + physics + maths;
- ❖ double average = totalMarks / 3.0;
- ❖
- ❖ System.out.println("Total Marks: " + totalMarks);
- ❖ System.out.println("Average Marks: " + averageMarks);
- ❖
- ❖ if (averageMarks > 75) {
- ❖ System.out.println("Pass");
- ❖ } else {
- ❖ System.out.println("Fail");
- ❖ }
- ❖
- ❖ }
- ❖ }

//
/////

47. Write a java program to find the maximum number of three integer numbers input by
the keyboard and print results as follows; "Maximum number is : 45"
48. Enter unit price and amount bought from a product. Calculate the total. If the total is
greater than Rs.1500/- display "You are entitled for the super draw. Otherwise display
"try again".
- ❖ import java.util.*;
- ❖ class Main{
- ❖ public static void main(String args[]){

- ❖ Scanner scanner = new Scanner(System.in);
- ❖ System.out.println("Enter three integer numbers:");
- ❖ int num1 = scanner.nextInt();
- ❖ System.out.println("Enter three integer numbers:");
- ❖ int num2 = scanner.nextInt();
- ❖ System.out.println("Enter three integer numbers:");
- ❖ int num3 = scanner.nextInt();
- ❖
- ❖ int max = Math.max(Math.max(num1, num2), num3);
- ❖ System.out.println("Maximum number is: " + max);
- ❖
- ❖ System.out.println("Enter unit price and amount bought for a product:"); ❖ double unitPrice = scanner.nextDouble();
- ❖ int amountBought = scanner.nextInt();
- ❖
- ❖ double total = unitPrice * amountBought;
- ❖
- ❖ if (total > 1500) {
- ❖ System.out.println("You are entitled for the super draw.");
- ❖ } else {
- ❖ System.out.println("Try again.");
- ❖ }
- ❖ }
- ❖ }

//

49. Enter unit price and amount bought from a product. Calculate the total. If the total is more than Rs.500/- give 5% discount. Calculate the discount and new total and display those. Otherwise display "No discount given".

- ❖ import java.util.*;
- ❖ class Main{
- ❖ public static void main(String args[]){
- ❖ Scanner scanner = new Scanner(System.in);
- ❖
- ❖ System.out.println("Enter unit price and amount bought for a product:"); ❖ double unitPrice = scanner.nextDouble();
- ❖ int amountBought = scanner.nextInt();
- ❖
- ❖ double total = unitPrice * amountBought;
- ❖

- ❖ if (total > 500) {
- ❖ double discount = 0.05 * total;
- ❖ double newTotal = total - discount;
- ❖ System.out.println("Total: " + total);
- ❖ System.out.println("5% Discount: " + discount);
- ❖ System.out.println("New Total:" + newTotal);
- ❖ } else {
- ❖ System.out.println("No discount given");
- ❖ }
- ❖ }
- ❖ }

//
/////

50. Write a Java program that allows a customer to request a cash withdrawal from an ATM. The program should take input for the requested withdrawal amount and determine whether the withdrawal can be made or not based on the following conditions:
- The withdrawal will be refused if amount entered > current balance
- The withdrawal will be refused if amount entered > daily withdrawal limit ● if current balance < 5000 rupees, then a charge of 2% is made.
- if current balance >= 5000, no charge is made
Appropriate output messages and any charge calculations should be included in your Program.

//
/////

51. Write a Java program to get a year from user input and find whether it is a leap year or Not.
- ❖ import java.util.*;
- ❖ class Main{
- ❖ public static void main(String args[]){
- ❖ Scanner scanner = new Scanner(System.in);
- ❖
- ❖ System.out.print("Enter a year: ");
- ❖ int year = scanner.nextInt();
- ❖
- ❖ boolean isLeapYear = (year % 4 == 0) && (year % 100 != 0 || year % 400 == 0); ❖
- ❖ if (isLeapYear) {
- ❖ System.out.println(year + " is a leap year.");

- ❖ } else {
- ❖ System.out.println(year + " is not a leap year.");
- ❖ }
- ❖
- ❖
- ❖ }
- ❖ }

//
/////

52. Write a Java program that calculates and indicates whether a business transaction resulted in a profit or a loss when the user enters the cost price and selling price of a product. Additionally, if there is neither a profit nor a loss, the program should provide a corresponding message.
- ❖ import java.util.*;
- ❖ class Main{
- ❖ public static void main(String args[]){
- ❖ Scanner scanner = new Scanner(System.in);
- ❖
- ❖ System.out.print("Enter cost price: ");
- ❖ double costPrice = scanner.nextDouble();
- ❖ System.out.print("Enter selling price: ");
- ❖ double sellingPrice = scanner.nextDouble();
- ❖
- ❖ if (sellingPrice > costPrice) {
- ❖ double profit = sellingPrice - costPrice;
- ❖ System.out.println("You made a profit of Rs. " + profit);
- ❖ } else if (costPrice > sellingPrice) {
- ❖ double loss = costPrice - sellingPrice;
- ❖ System.out.println("You incurred a loss of Rs. " + loss);
- ❖ } else {
- ❖ System.out.println("You neither made a profit nor incurred a loss."); ❖ }
- ❖
- ❖
- ❖ }
- ❖ }

//
/////

53. Write a Java program that takes user input for the marks obtained in "Computer

Networking" subject and then determine and display the corresponding grade based on the following grading scheme.

```java
import java.util.*;
class Main{
public static void main(String args[]){
Scanner scanner = new Scanner(System.in);



System.out.print("Enter marks Computer Networking: ");
double marks = scanner.nextDouble();

String grade = calculateGrade(marks);
System.out.println("Grade for Computer Networking: " + grade);
}

public static String calculateGrade(double marks) {
if (marks >= 90) {
return "A+";
} else if (marks >= 80) {
return "A";
} else if (marks >= 70) {
return "B";
} else if (marks >= 60) {
return "C";
} else if (marks >= 50) {
return "D";
} else {
return "F";
}
}
}
```

//
/////

54. Write a Java program to calculate an electricity bill for a given number of consumed units. The program should consider the following price ranges:
● For the first 100 units, the rate is $0.50 per unit.
● For the next 200 units (101 to 300), the rate is $0.75 per unit.
● For any units beyond 300, the rate is $1.20 per unit.

```java
import java.util.*;
class Main{
public static void main(String args[]){
Scanner scanner = new Scanner(System.in);
System.out.print("Enter the number of consumed units: ");
int consumedUnits = scanner.nextInt();

double bill = calculateElectricityBill(consumedUnits);

System.out.println("Electricity Bill: $" + bill);

scanner.close();
}

public static double calculateElectricityBill(int units) {
double rate = 0.0;
if (units <= 100) {
rate = 0.50;
} else if (units <= 300) {
rate = 0.75;
} else {
rate = 1.20;
}

return units * rate;
}
}
```

//
/////

55. The roots of the quadratic equation depends on the Discriminant (D).
a. If D > 0, the roots are real and distinct.
b. If D = 0, the roots are real and equal.
c. If D < 0, the roots are imaginary.
The discriminant formula of a quadratic equation $ax^2 + bx + c = 0$ is, $D = b^2 - 4ac$.
Write a Java program that takes user input for the coefficients a, b, and c of a quadratic equation and calculates the discriminant. Based on the discriminant value, determine and display the nature of the roots using appropriate messages.

56. Write a Java program to calculate the income tax of an employee. Your program should take the employee's income as input, calculate the income tax based on the following income tax rates, and then display the calculated income tax.

● Income less than 250,000: No tax.
● Income between 250,000 and 500,000: 2.5% tax.
● Income between 500,000 and 1,000,000: 5% tax.
● Income above 1,000,000: 15% tax.

```java
import java.util.*;
class Main{
public static void main(String args[]){
Scanner scanner = new Scanner(System.in);


System.out.print("Enter the employee's income: Rs. ");
double income = scanner.nextDouble();

double tax = calculateIncomeTax(income);

System.out.println("Income Tax: Rs. " + tax);

scanner.close();
}

public static double calculateIncomeTax(double income) {
double tax = 0.0;

if (income < 250000) {
tax = 0.0;
} else if (income <= 500000) {
tax = 0.025 * (income - 250000);
} else if (income <= 1000000) {
tax = 0.025 * 250000 + 0.05 * (income - 500000);
} else {
tax = 0.025 * 250000 + 0.05 * 500000 + 0.15 * (income - 1000000); }

return tax;
}
}
```

//
/////
57. Write a Java program that calculates the number of days up to a given month in a non leap year. You can use a switch statement to handle each month's case and accumulate

the days accordingly.
58. Write a Java program that takes 3 integers which represent the number of runs scored, the number of innings played by a batsman, and the number of times the batsman remained not out, respectively as inputs and calculates the batting average of a batsman using the following formula:

Batting Average = Runs Scored / Number of Dismissals

Where, Number of Dismissals = Number of Innings −
Number of Innings the batsman remained Not Out
Note: If the batsman was never dismissed, print "NA" as the no average can be defined. A cricket batsman's batting average typically falls within the range of 10 and 50. The common interpretation of the results is as follows:
● Below 10: Poor batting skills
● 10 - 20: Average batting skills
● 20 - 30: Above-average batting skills
● 30 - 40: Good batting skills
● 40 - 50: Very good batting skills
● Above 50: Extraordinary batting skills
Modify your Java program to provide the interpretation based on the batting
average. ❖ import java.util.*;
❖ class Main{
❖ public static void main(String args[]){
❖ Scanner scanner = new Scanner(System.in);
❖
❖
❖ System.out.print("Enter a month (1-12): ");
❖ int month = scanner.nextInt();
❖
❖ int daysUpToMonth = calculateDaysUpToMonth(month);
❖ System.out.println("Number of days up to the entered month: " + daysUpToMonth + "
  days");
❖
❖ scanner.close();
❖ }
❖

```java
❖ public static int calculateDaysUpToMonth(int month) {
❖ int daysUpToMonth = 0;
❖
❖ switch (month) {
❖ case 1:
❖ daysUpToMonth = 0;
❖ break;
❖ case 2:
❖ daysUpToMonth = 31;
❖ break;
❖ case 3:
❖ daysUpToMonth = 59;
❖ break;
❖ case 4:
❖ daysUpToMonth = 90;
❖ break;
❖ case 5:
❖ daysUpToMonth = 120; ❖ break;
❖ case 6:
❖ daysUpToMonth = 151; ❖ break;
❖ case 7:
❖ daysUpToMonth = 181; ❖ break;
❖ case 8:
❖ daysUpToMonth = 212; ❖ break;
❖ case 9:
❖ daysUpToMonth = 243; ❖ break;
❖ case 10:
❖ daysUpToMonth = 273; ❖ break;
❖ case 11:
❖ daysUpToMonth = 304; ❖ break;
❖ case 12:
❖ daysUpToMonth = 334; ❖ break;
❖ default:
❖ System.out.println("Invalid month."); ❖ }
❖
❖ return daysUpToMonth;
❖ }
❖ }
```

///
/////

59. Write a program in Java to read the month name and year from the user and find the

number of days in a given month and year using a switch statement.

```java
import java.util.*;
class Main{
public static void main(String args[]){
Scanner scanner = new Scanner(System.in);

System.out.print("Enter the month name (e.g., January): ");
String monthName = scanner.nextLine();
System.out.print("Enter the year: ");
int year = scanner.nextInt();

int daysInMonth = calculateDaysInMonth(monthName, year);

if (daysInMonth > 0) {
System.out.println("Number of days in " + monthName + " " + year + ": " +
  daysInMonth + " days");
} else {
System.out.println("Invalid input. Please enter a valid month name."); }

scanner.close();
}

public static int calculateDaysInMonth(String monthName, int year) { int
daysInMonth = -1;
String month = monthName.toLowerCase();

switch (month) {
case "january":
case "march":
case "may":
case "july":
case "august":
case "october":
case "december":
daysInMonth = 31;
break;
case "april":
case "june":
case "september":
case "november":
daysInMonth = 30;
break;
```

```java
❖ case "february":
❖ if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) { ❖
daysInMonth = 29;
❖ } else {
❖ daysInMonth = 28;
❖ }
❖ break;
❖ }
❖
❖ return daysInMonth;
❖ }
❖ }
```

//
/////

60. Write a Java program that counts the total number of various denominations of currency notes in a given amount. You have the following denominations available: 500, 100, 50, 20, 10, 5, 2, and 1. Your program should take an integer amount as input and then calculate and display the minimum number of each denomination needed to make up that amount.

```java
❖ import java.util.*;
❖ class Main{
❖ public static void main(String args[]){
❖ Scanner scanner = new Scanner(System.in);
❖
❖ System.out.print("Enter the amount: Rs. ");
❖ int amount = scanner.nextInt();
❖
❖ calculateDenominations(amount);
❖
❖ scanner.close();
❖ }
❖
❖ public static void calculateDenominations(int amount) {
❖ int[] denominations = { 500, 100, 50, 20, 10, 5, 2, 1 };
❖ int[] counts = new int[denominations.length];
❖
❖ System.out.println("Denominations:");
❖ for (int i = 0; i < denominations.length; i++) {
❖ if (amount >= denominations[i]) {
❖ counts[i] = amount / denominations[i];
```

- ❖ amount %= denominations[i];
- ❖ System.out.println(denominations[i] + " Rs notes: " + counts[i]); ❖ }
- ❖ }
- ❖ }
- ❖ }

//
/////

61. Write a Java program to calculate the gross salary of an employee based on their basic salary.

Basic Salary <= 10000 : HRA = 20%, DA = 80%
Basic Salary <= 20000 : HRA = 25%, DA = 90%
Basic Salary > 20000 : HRA = 30%, DA = 95%
Use the following formula to calculate gross salary:
Gross Salary = Basic Salary + HRA + DA
Where HRA = House Rent Allowance , DA = Dearness Allowance
- ❖

//
/////

62. Write a Java program that takes input from the user for the lengths of three sides of a triangle and decides if it is an equilateral, scalene or isosceles triangle.
- ❖ import java.util.*;
- ❖ class Main{
- ❖ public static void main(String args[]){
- ❖ Scanner scanner = new Scanner(System.in);
- ❖
- ❖
- ❖ System.out.println("Enter the lengths of the three sides of the triangle:"); ❖
- ❖ System.out.print("Side 1: ");
- ❖ double side1 = scanner.nextDouble();
- ❖
- ❖ System.out.print("Side 2: ");
- ❖ double side2 = scanner.nextDouble();
- ❖
- ❖ System.out.print("Side 3: ");
- ❖ double side3 = scanner.nextDouble();
- ❖
- ❖ String triangleType = determineTriangleType(side1, side2, side3);
- ❖

```java
    System.out.println("Triangle is " + triangleType);

    }

    public static String determineTriangleType(double side1, double side2, double side3) {
    if (side1 == side2 && side2 == side3) {
    return "an equilateral triangle";
    } else if (side1 == side2 || side1 == side3 || side2 == side3) {
    return "an isosceles triangle";
    } else {
    return "a scalene triangle";
    }
    }
    }
```

//
/////

63. A library charges a fine for every book returned late. For the first 5 days the fine is 15 rupees per day, for 6-10 days fine is 30 rupees per day and above 10 days fine is 50 rupees per day. If you return the book after 30 days your membership will be cancelled. Write a program in Java to accept the number of days the member is late to return the book and display the fine or the appropriate message.

```java
    import java.util.*;
    class Main{
    public static void main(String args[]){
    Scanner scanner = new Scanner(System.in);

    System.out.print("Enter the number of days the book is late: ");    int
    daysLate = scanner.nextInt();

    int fine = calculateFine(daysLate);

    if (fine >= 0) {
    System.out.println("Fine for " + daysLate + " days late: Rs. " + fine);    }
    else {
    System.out.println("Membership cancelled. Book returned after 30 days.");    }
    }

    public static int calculateFine(int daysLate) {
    if (daysLate <= 5) {
    return daysLate * 15;
    } else if (daysLate <= 10) {
```

```java
❖ return 5 * 15 + (daysLate - 5) * 30;
❖ } else if (daysLate <= 30) {
❖ return 5 * 15 + 5 * 30 + (daysLate - 10) * 50;
❖ } else {
❖ return -1;
❖ }
❖ }
❖ }
```

//
/////

64. A certain grade of steel is graded according to the following conditions:

Hardness must be greater than 50.
Carbon content must be less than 0.7.
Tensile strength must be greater than 5600.

The grades are assigned as follows:
● Grade 4 if all three conditions are met.
● Grade 3 if exactly two conditions are met.
● Grade 2 if only one condition is met.
● Grade 1 if none of the conditions are met.
Write a Java program that requires the user to provide values for the hardness, carbon content, and tensile strength of the steel under consideration and output the grade of the steel.

```java
❖ import java.util.*;
❖ class Main{
❖ public static void main(String args[]){
❖ Scanner scanner = new Scanner(System.in);
❖
❖
❖ System.out.print("Enter hardness: ");
❖ double hardness = scanner.nextDouble();
❖ System.out.print("Enter carbon content: ");
❖ double carbonContent = scanner.nextDouble();
❖ System.out.print("Enter tensile strength: ");
❖ double tensileStrength = scanner.nextDouble();
❖
❖ int grade = checkSteelGrade(hardness, carbonContent, tensileStrength); ❖
❖ switch (grade) {
❖ case 4:
```

```java
    System.out.println("Grade 4: All conditions are met.");
    break;
case 3:
    System.out.println("Grade 3: Exactly two conditions are met.");
    break;
case 2:
    System.out.println("Grade 2: Only one condition is met.");
    break;
case 1:
    System.out.println("Grade 1: None of the conditions are met.");
    break;
default:
    System.out.println("Invalid input.");
    break;
}
}

public static int checkSteelGrade(double hardness, double carbonContent, double
    tensileStrength) {
int conditionsMet = 0;

if (hardness > 50) {
    conditionsMet++;
}
if (carbonContent < 0.7) {
    conditionsMet++;
}
if (tensileStrength > 5600) {
    conditionsMet++;
}

if (conditionsMet == 3) {
    return 4;
} else if (conditionsMet == 2) {
    return 3;
} else if (conditionsMet == 1) {
    return 2;
} else {
    return 1;
}
}
}
```

//
/////

65.Write a Java program that takes the ages of three individuals, John, Mary, and David, as

input from the keyboard. The program should then determine and display who among them is the youngest. Modify the program to print their names in order from youngest to oldest.

- ❖ import java.util.*;
- ❖ class Main{
- ❖ public static void main(String args[]){
- ❖ Scanner scanner = new Scanner(System.in);
- ❖
- ❖
- ❖ System.out.print("Enter John's age: ");
- ❖ int johnAge = scanner.nextInt();
- ❖ System.out.print("Enter Mary's age: ");
- ❖ int maryAge = scanner.nextInt();
- ❖ System.out.print("Enter David's age: ");
- ❖ int davidAge = scanner.nextInt();
- ❖
- ❖ String youngestPerson = findYoungest(johnAge, maryAge, davidAge); ❖
- ❖ System.out.println(youngestPerson + " is the youngest.");
- ❖
- ❖ scanner.close();
- ❖ }
- ❖
- ❖ public static String findYoungest(int johnAge, int maryAge, int davidAge) { ❖ if (johnAge < maryAge && johnAge < davidAge) {
- ❖ return "John";
- ❖ } else if (maryAge < johnAge && maryAge < davidAge) {
- ❖ return "Mary";
- ❖ } else {
- ❖ return "David";
- ❖ }
- ❖ }
- ❖ }

///
/////

66. Write a Java program to create an invoice for the purchase of the following items:
– Carrots: $2 / lb
– Onions – $4 / lb
– Meat – $10 / lb
The program should perform the following tasks:

a. Prompt the customer to enter how many lbs do they need, and calculate the total.

b. Offer two payment options: (1) cash or (2) card

– If Card, add 13% HST (Harmonized Sales Tax) to total

– if Cash, don't add Tax

c. Display the total amount that customer needs to pay.

- ❖ import java.util.*;
- ❖ class Main{
- ❖ public static void main(String args[]){
- ❖ Scanner scanner = new Scanner(System.in);
- ❖
- ❖
- ❖ double priceCarrots = 2.0;
- ❖ double priceOnions = 4.0;
- ❖ double priceMeat = 10.0;
- ❖
- ❖ System.out.print("Enter the quantity of Carrots: ");
- ❖ double lbsCarrots = scanner.nextDouble();
- ❖ System.out.print("Enter the quantity of Onions: ");
- ❖ double lbsOnions = scanner.nextDouble();
- ❖ System.out.print("Enter the quantity of Meat: ");
- ❖ double lbsMeat = scanner.nextDouble();
- ❖
- ❖ double subtotal = (lbsCarrots * priceCarrots) + (lbsOnions * priceOnions) + (lbsMeat * priceMeat);
- ❖
- ❖ System.out.println("Select payment method: ");
- ❖ System.out.println("1. Cash");
- ❖ System.out.println("2. Card");
- ❖ int paymentMethod = scanner.nextInt();
- ❖
- ❖ double totalAmount;
- ❖ if (paymentMethod == 1) {
- ❖ totalAmount = subtotal;
- ❖ } else if (paymentMethod == 2) {
- ❖ double tax = 0.13 * subtotal;
- ❖ totalAmount = subtotal + tax;
- ❖ } else {
- ❖ System.out.println("Invalid payment method. Please select 1 for Cash or 2 for Card.");
- ❖ return;

❖ }
❖
❖ System.out.println("Total Amount: $" + totalAmount);
❖
❖
❖ }
❖ }

///
/////

67. Write a Java program to determine the colours of squares on an 8x8 checkerboard. The checkerboard alternates between black and white squares, with 8 rows and 8 columns as below. The program should allow the user to input the row and column numbers (both ranging from 1 to 8), and then it should display whether the square at that position is black or white.

```java
import java.util.*;
class Main{
public static void main(String args[]){
Scanner scanner = new Scanner(System.in);


System.out.print("Enter the row number (1-8): ");
int row = scanner.nextInt();
System.out.print("Enter the column number (1-8): ");
int column = scanner.nextInt();

String squareColor = checkSquareColor(row, column);

System.out.println("The square at row " + row + ", column " + column + " is " +
squareColor + ".");

scanner.close();
}

public static String checkSquareColor(int row, int column) {
if ((row + column) % 2 == 0) {
return "white";
} else {
return "black";
}
}
```

❖ }

///
////

****