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01.

A. **if Statement**: The `if` statement is used to execute a block of code if a specified condition is true.

B. **else-if Statement**: The `else if` statement is used to specify a new condition to test if the previous `if` or `else if` condition is false.

C. **switch Statement**: The `switch` statement allows you to select one of many code blocks to be executed, based on the value of an expression.

02.

advantages	**disadvantages**
Readability	Limited Expression
Efficiency	Equality Comparison
Falls Through	No Range Testing
Enumeration	No Short-Circuiting

03.

Purpose: The `default` case is a special case that is executed when none of the other `case` values match the expression provided to the `switch` statement. It acts as a catch-all or a fallback case.

Purpose: The `break` statement is used to exit the `switch` statement after a particular `case` is executed. Without the `break` statement, the control flow would "fall through" to the subsequent `case` statements, executing them as well. It's used to prevent this fallthrough behavior.

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04.

```
int k = 8;

if (k >= 6) {
   System.out.println("The value : " + k);
}
```

05.

```
int w = 4;
int x = 2;
int y = 3;

int z;

if (w <= 5 && x <= (w - y)) {
    z = 1;
} else if (y == 0) {
    z = 0;
} else {
    z = 0;
}

System.out.println("The value : " + z);
```

06.

```
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");
}
```

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07.

a.

```
int k = 7;
String s;

if (k % 2 == 0) {
   s = "Even";
} else {
   s = "Odd";
}

System.out.println("s is " + s);
```

b.

```
int k = 7;
String s;

switch (k % 2) {
   case 0:
      s = "Even";
     break;
   case 1:
      s = "Odd";
     break;
   default:
      s = "Invalid";
}

System.out.println("s is " + s);
```

08.

int: Integer values.
byte: Byte values.
short: Short integer values.
char: Character values.
enum: Enumeration types (since Java 5).
String: String objects (since Java 7).

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09.

1
2
3

10.

false

11.

2
4

12.

A.

```
String cmd;

switch (k) {
  case 1:
       cmd = "Edit";
     break;
    case 2:
        cmd = "Add";
      break;
   case 3:
       cmd = "Quit";
        break;
    default:
        cmd = "Invalid";
}
```

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B.

```
        int p;

switch (k) {
   case 1:
    case 3:
   p = 1;
       break;
    case 2:
    case 4:
       p = 2;
       break;
    case 5:
       p = 3;
       break;
       p = 4;
}
```

13.

`p != q` checks whether `p` is not equal to `q`.
`!p` negates the value of `p`.
`p != q && !p` checks if both conditions are true.

14.

a. boolean p = (c == 'a') ? true : false;

b. boolean p = c == 'a';

15.

c. legal

e. legal

f. legal

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16.

a. legal
b. legal
c. legal
d. legal
e. legal
f. legal

17.

a. 9
b. false
c. true
d. false
e. true

18.

a. true
b. true
c. true
d. false
e. true
f. false
g. true

19.

++x==x : 100
x==x++ : 100
++x==x++ : 101

20.

c. legal
d. legal
g. legal
h. legal

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21.

++x==x : 101
x==x++ : 102
++x==x++ : 109

22.

b. legal

23.

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

24.

a. true
b. false
c. true
d. false
e. true
f. false
g. false

25.

a. `10`
b. `true`
c. `true`
d. `true`
e. `true`
f. `false`

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26.

a. 2351.521.231ctrue
b. 101001251.521.231ctrue
c.356.731true
d. illegal
e. illegal

27.

a. 1 2 3
b. 2 3
c. 3
d. 4 1 2 3
e. 4 1 2 3
f. 4 1 2 3

28.

a. 1
b. 2 3 1
c. 3 1
d. 4
e. 4
f. 4

29.

a. if(x>0){a=0;}
b. a=0;
e. if(true){a=0;}
g. a=z>0?0:-1;

30.

n < 10" nor "n > 5".

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31.

a. legal
b. legal
c. legal
d. legal
e. legal
f. legal
g. illegal
h. legal
i. illegal
j. illegal

32.

d. Prints 0 0

33.

a. char x=’A’;
b. int x=65;

34.

d. Compiler Error: variable d might not have been initialized.

35.

```
    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 < 1200.00)
    System.out.println("You are living below the
poverty line.");
else if (income < 2500.00)
    System.out.println("You are living in moderate
comfort.");
```

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```
else
    System.out.println("You are well off.");
```

36.

```
    b. legal
    c. legal
    f. legal
```

37.

```
    danger
    count = 4
```

38.

```
    a. "Pass" and "Thanking you."
    b. "Pass" and "Thanking you."
    c. "Fail" and "Thanking you."
    d. "Pass" and "Thanking you."
    e. "Pass" and "Thanking you."
    f. "Fail" and "Thanking you."
    g. "Fail" and "Thanking you."
```

39.

```
    k=0,1
        A
        B
        D

    k= 2,3
        B
        D

    k= 4
        C
        D
```

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40.

```
    import java.util.*;

public class NumberTypeChecker {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);

        System.out.print("Enter a number: ");
        double number = input.nextDouble();

        if (number > 0) {
            System.out.println("The number is positive.");
        } else if (number < 0) {
            System.out.println("The number is negative.");
        } else {
            System.out.println("The number is     zero.");
        }


    }
}
```

41.

```
    import java.util.*;

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

        System.out.print("Enter a character: ");
        char ch = scanner.next().charAt(0);

        ch = Character.toLowerCase(ch);

        if (ch >= 'a' && ch <= 'z') {
            if (ch == 'a' || ch == 'e' || ch == 'i' || ch ==
'o' || ch == 'u') {
                System.out.println(ch + " is a vowel.");
            } else {
                System.out.println(ch + " is a consonant.");
            }
        } else {
            System.out.println(ch + " is not valid");
        }
    }}
```

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42.

```
    import java.util.*;

public class Main {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);

        System.out.print("Enter a num: ");
        int num = input.nextInt();



        if (num%7==0 && num%8==0) {
            System.out.println(num+"="+"yes");
           } else {
                System.out.println(num+"="+"no");

        }
    }

}
```

43.

```
    import java.util.*;

public class Main {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);

        System.out.print("Enter the first number: ");
        double num1 = input.nextDouble();

        System.out.print("Enter the second number:
");
        double num2 = input.nextDouble();

        if (num1 == num2) {
            System.out.println(" equal.");
        } else if (num1 > num2) {
```

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```
 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.

```
    import java.util.*;

public class Main {
    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);

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

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

        System.out.print("Enter the third number: ");
        double number3 = input.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 a strictly increasing or decreasing order.");
        }
       }}
```

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45.

```
    import java.util.Scanner;
    public class Main {
    public static void main(String[] args) {
    Scanner input = new Scanner(System.in);
    System.out.println("Enter a number:");
    int num = input.nextInt();
    if(num>0){
    System.out.println(num);
    }else{
    System.out.println(-num);
}
}
}
```

46.

```
    import java.util.Scanner;
    public class Main {
    public static void main(String[] args) {
    Scanner input = new Scanner(System.in);
    System.out.println("Enter marks for Chemistry:");
    double chem = input.nextDouble();
    System.out.println("Enter marks for Physics:");
    double phys = input.nextDouble();
    System.out.println("Enter marks for Combined
    Maths:");
    double maths = input.nextDouble();
    double average = (chem + phys + maths) / 3;
    if (average >= 75) {
    System.out.println("Pass");
    } else {
    System.out.println("Fail");
}
}
}
```

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47.

```
    import java.util.Scanner;
public class Main{
public static void main(String[] args) {
Scanner input = new Scanner(System.in);
System.out.println("Enter three numbers:");
int num1 = input.nextInt();
int num2 = input.nextInt();
int num3 = input.nextInt();
int max = 0;

if(max < num1) {
max = num1;
}
if(max < num2) {
max = num2;
}
if(max < num3) {
max = num3;
}
System.out.println("The max value is " + max);
}
}
```

48.

```
    import java.util.Scanner;
public class Main {
public static void main(String[] args) {
Scanner input = new Scanner(System.in);
System.out.println("Enter unit price:");
double price = input.nextDouble();
System.out.println("Enter amount bought:");
int amount = input.nextInt();
double total = price * amount;
if (total > 1500) {
System.out.println("You are entitled for the super
draw.");
```

```
} else {
System.out.println("Try again.");
}
}
```

49.

```
import java.util.Scanner;

public class Main {
     public static void main(String[] args) {
          Scanner input = new Scanner(System.in);
          System.out.println("Enter unit price:");
          double unitPrice = input.nextDouble();
          System.out.println("Enter amount bought:");
          int amount = input.nextInt();
          double total = unitPrice * amount;
          if (total > 500) {
               double discount = total * 0.05;
               total = total - discount;
               System.out.println("Discount given: " +
               discount);
               System.out.println("New Total: " + total);
          } else {
               System.out.println("No discount given.");
     }
}
}
```

50.

```
import java.util.Scanner;
public class Main {
     public static void main(String[] args) {
          Scanner input = new Scanner(System.in);
          double currentBalance = 10000;
          double dailyLimit = 2000;
          System.out.println("Enter withdrawal amount:");
          double withdrawal = input.nextDouble();
          if (withdrawal > currentBalance) {
               System.out.println("Withdrawal denied:
               Insufficient balance.");
     return;
```

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```
        }
        if (withdrawal > dailyLimit) {
            System.out.println("Withdrawal denied:
            Exceeded daily limit.");
        return;
        }
        if (currentBalance < 5000) {
            double charge = withdrawal * 0.02;
            currentBalance -= (withdrawal + charge);
            System.out.println("Charged 2% fee: " +
        charge);
} else {
currentBalance -= withdrawal;
}
System.out.println("New Balance: " + currentBalance);
}
```

51.

```
    import java.util.Scanner;
    public class Main {
        public static void main(String[] args) {
            Scanner input = new Scanner(System.in);
            System.out.println("Enter a year:");
            int year = input.nextInt();
            if ((year % 4 == 0 && year % 100 != 0) ||
            year % 400 == 0) {
                System.out.println(year + " is a leap
                year.");
            } else {
                System.out.println(year + " is not a
            leap year.");
        }
    }
}
```

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52.

```
import java.util.Scanner;

     public class Main {
          public static void main(String[] args) {
               Scanner input = new Scanner(System.in);
               System.out.println("Enter the cost price:");

          double costPrice = input.nextDouble();
          System.out.println("Enter the selling price:");

          double sellingPrice = input.nextDouble();
          if (sellingPrice > costPrice) {
               System.out.println("The transaction resulted in
               a profit.");
          } else if (sellingPrice < costPrice) {
               System.out.println("The transaction resulted in
               a loss.");
          } else {
               System.out.println("There was neither a profit
               nor a loss.");
          }
     }
}
```

53.

```
import java.util.*;

public class Main {
     public static void main(String[] args) {
     Scanner input = new Scanner(System.in);
     System.out.print("Input computer networking mark : ");
     double mark = input.nextDouble();
     System.out.println(mark>=75 ? "A-Distinction Pass" :
     mark>=65 ? "Very
     Good Pass" : mark>=50 ? "Credit Pass" : mark>=35 ?
"Ordinary Pass" : "Fail");
     }
}
```

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54.

```
Import java.util.Scanner;
public class Main {
     public static void main(String[] args) {
     Scanner input = new Scanner(System.in);
     System.out.println("Enter the number of consumed
     units:");
     double units = input.nextDouble();
     double bill = 0;
     if (units <= 100) {
          bill = units * 0.50;
     } else if (units <= 300) {

     bill = 100 * 0.50 + (units - 100) * 0.75;
     } else {
     bill = 100 * 0.50 + 200 * 0.75 + (units - 300) * 1.20;
     }
     System.out.println("Your electricity bill is: $" + bill);
}
}
```

55.

```
import java.util.Scanner;

public class Main {
     public static void main(String[] args) {
          Scanner input = new Scanner(System.in);
          System.out.println("Enter coefficient a:");
          double a = input.nextDouble();
          System.out.println("Enter coefficient b:");
          double b = input.nextDouble();
          System.out.println("Enter coefficient c:");
          double c = input.nextDouble();
          double discriminant = b * b - 4 * a * c;
          if (discriminant > 0) {
               System.out.println("The roots real and
               distinct.");
          } else if (discriminant == 0) {
               System.out.println("The roots real and
               equal.");
          } else {
               System.out.println("The roots imaginary.");
          }
     }
}
```

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56.

```
     Import java.util.Scanner;
     public class Main {
          public static void main(String[] args) {
     Scanner input = new Scanner(System.in);
     System.out.println("Enter the employee's income:");
     double income = input.nextDouble();
     double tax;
     if (income < 250000) {
          tax = 0;
     } else if (income <= 500000) {
          tax = 0.025 * income;
     } else if (income <= 1000000) {
          tax = 0.05 * income;
     } else {
          tax = 0.15 * income;
     }
     System.out.println("The calculated income tax is: " + tax);
     }
}
```

57.

```
     import java.util.Scanner;
     public class Main {
          public static void main(String[] args) {
          Scanner input = new Scanner(System.in);
          System.out.println("Enter a month");
          int month = input.nextInt();
          int days = 0;
     switch (month) {
          case 12: days += 30;
          case 11: days += 31;
          case 10: days += 30;
          case 9: days += 31;
          case 8: days += 31;
          case 7: days += 30;
          case 6: days += 31;
          case 5: days += 30;
          case 4: days += 31;
          case 3: days += 28;
          case 2: days += 31;
          case 1: break;
     default:
          System.out.println("Invalid month.");
     return;
     }
     System.out.println("Number of days up to the given month: " +
     days);}}
```

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58.

```
     import java.util.Scanner;
     public class Main {
          public static void main(String[] args) {
               Scanner input = new Scanner(System.in);
               System.out.println("Enter the number of runs
               scored:");
               int runs = input.nextInt();
               System.out.println("Enter the number of innings
               played:");
               int innings = input.nextInt();
               System.out.println("Enter the number of times the
               batsman remained
          not out:");
          int notOut = input.nextInt();
     int dismissals = innings - notOut;
     if (dismissals == 0) {
     System.out.println("NA");
     return;
}
     double battingAverage = (double) runs / dismissals;
     System.out.println("Batting Average: " + battingAverage);
     if (battingAverage < 10) {
     System.out.println("Poor batting skills");
} else if (battingAverage < 20) {

     System.out.println("Average batting skills");
     } else if (battingAverage < 30) {
          System.out.println("Above-average batting skills");
          } else if (battingAverage < 40) {
          System.out.println("Good batting skills");
     } else if (battingAverage < 50) {
          System.out.println("Very good batting skills");
     } else {
          System.out.println("Extraordinary batting skills");
     }
}
}
```

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59.

```
    import java.util.Scanner;
    public class Main {
        public static void main(String[] args) {
        Scanner input = new Scanner(System.in);
    System.out.println("Enter the month name:");
    String month = input.next().toLowerCase();
    System.out.println("Enter the year:");
        int year = input.nextInt();
    int days = 0;
    switch (month) {
        case "january":
        case "march":
        case "may":
        case "july":
        case "august":
        case "october":
        case "december":
        days = 31;
    break;
        case "april":
        case "june":
        case "september":

        case "november":
        days = 30;
    break;
    case "february":
        if ((year % 4 == 0 && year % 100 != 0) ||
        (year % 400 ==
        0)) {
        days = 29;
    } else {
    days = 28;
    }
break;
default:
System.out.println("Invalid month name."); return;
}
```

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```
    System.out.println("Number of days in " + month +
    " of " + year + "
    is: " + days);
    }
}
```

60.

```
    import java.util.*;
public class Main {
public static void main(String args[]){
Scanner input = new Scanner(System.in);
System.out.print("Input amount : ");
int amount = input.nextInt();
int _500 = amount / 500;
amount %= 500;
int _100 = amount / 100;
amount %= 100;
int _50 = amount / 50;
amount %= 50;
int _20 = amount / 20;
amount %= 20;
int _10 = amount / 10;

amount %= 10;
int _5 = amount / 5;
amount %= 5;
int _2 = amount / 2;
amount %= 2;
int _1 = amount / 1;
System.out.println("500 : " + _500 + "\n100 : " +
_100 + "\n50 : " + _50 +
"\n20 : " + _20 + "\n10 : " + _10 + "\n5 : " + _5 +
"\n2 : " + _2 + "\n1 :
" + _1); }
}
```

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61.

```
     import java.util.Scanner;
     public class Main {
          public static void main(String[] args) {
          Scanner input = new Scanner(System.in);
          System.out.println("Enter the basic salary:");
          double basic = input.nextDouble();
          double hra, da;
          if (basic <= 10000) {
               hra = 0.20 * basic;
               da = 0.80 * basic;
          } else if (basic <= 20000) {
               hra = 0.25 * basic;
               da = 0.90 * basic;
          } else {
               hra = 0.30 * basic;
               da = 0.95 * basic;
          }
          double gross = basic + hra + da;
          System.out.println("Gross Salary: " + gross);
     }
}
```

62.

```
     import java.util.Scanner;

     public class Main {
          public static void main(String[] args) {
          Scanner input = new Scanner(System.in);
          System.out.print("Enter the first side of the triangle:
          ");
          double side1 = input.nextDouble();
          System.out.print("Enter the second side of the triangle:
          ");
          double side2 = input.nextDouble();
          System.out.print("Enter the third side of the triangle:
          ");
double side3 = input.nextDouble();
if (side1 == side2 && side2 == side3) {
     System.out.println("The triangle is Equilateral.");
} else if (side1 == side2 || side1 == side3 || side2 == side3) {
     System.out.println("The triangle is Isosceles.");
} else {
     System.out.println("The triangle is Scalene.");
          }
     }
}
```

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63.

```
import java.util.Scanner;
public class Main{
     public static void main(String[] args) {
     Scanner input = new Scanner(System.in);
     System.out.print("Enter the number of days
the book is returned late:
     ");
int daysLate = input.nextInt();
     int fine = 0;
if (daysLate <= 5) {
     fine = daysLate * 15;
} else if (daysLate <= 10) {

     fine = (5 * 15) + (daysLate - 5) * 30;
} else if (daysLate <= 30) {
     fine = (5 * 15) + (5 * 30) + (daysLate - 10)     * 50;
} else {
     System.out.println("Your membership has been
canceled due to
returning the book after 30 days.");
return;
     }
System.out.println("The fine to be paid is: " +  fine + "
rupees.");
     }
}
```

64.

```
import java.util.Scanner;
public class Main {
     public static void main(String[] args) {
     Scanner input = new Scanner(System.in);
     System.out.print("Enter the hardness of the steel: ");
double hardness = input.nextDouble();
     System.out.print("Enter the carbon content of the steel:
     ");
     double carbonContent = input.nextDouble();
System.out.print("Enter the tensile strength of the steel: ");
double tensileStrength = input.nextDouble();


     int conditionsMet = 0;
if (hardness > 50) conditionsMet++;
if (carbonContent < 0.7) conditionsMet++;
if (tensileStrength > 5600) conditionsMet++;
     int grade;
switch (conditionsMet) {
```

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```
          case 3:
               grade = 4;
          break;
          case 2:
               grade = 3;
          break;
          case 1:
               grade = 2;
          break;
          default:
               grade = 1;
          break;
     }
          System.out.println("The grade of the steel is: " +
          grade);
}}
```

65.

```
     import java.util.Scanner;
     public class Main {
          public static void main(String[] args) {
          Scanner input = new Scanner(System.in);
          System.out.print("Enter John's age: ");
          int johnAge = input.nextInt();
          System.out.print("Enter Mary's age: ");
          int maryAge = input.nextInt();
          System.out.print("Enter David's age: ");
          int davidAge = input.nextInt();
          System.out.println(

     johnAge < maryAge && johnAge < davidAge ? "John is the
     youngest." :
          maryAge < johnAge && maryAge < davidAge ? "Mary is the
     youngest." :
"David is the youngest."
);
     System.out.println("\nOrder from youngest to oldest:");
     System.out.println(
     johnAge <= maryAge && johnAge <= davidAge ? "John" :
maryAge <= johnAge && maryAge <= davidAge ? "Mary" :
     "David"
);
System.out.println(
     (johnAge <= maryAge && johnAge <= davidAge)
? (maryAge <= davidAge ? "Mary" : "David")
     : (maryAge <= johnAge && maryAge <= davidAge)
     ? (johnAge <= davidAge ? "John" : "David")
: (johnAge <= maryAge ? "John" : "Mary")
);
```

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```
     System.out.println(
     johnAge > maryAge && johnAge > davidAge ? "John" :
     maryAge > johnAge && maryAge > davidAge ? "Mary" :
     "David"
);
}
}
```

66.

```
     import java.util.Scanner;
          public class Main {
          public static void main(String[] args) {
     Scanner input = new Scanner(System.in);
     double CARROTS_PRICE = 2.0, ONIONS_PRICE = 4.0,
MEAT_PRICE = 10.0, HST = 0.13;
     N
System.out.println("Enter lbs of Carrots:");
double carrots = input.nextDouble();
     System.out.println("Enter lbs of Onions:");
double onions = input.nextDouble();
     System.out.println("Enter lbs of Meat:");
double meat = input.nextDouble();
     double total = (CARROTS_PRICE * carrots) + (ONIONS_PRICE *
onions) + (MEAT_PRICE * meat);
System.out.println("Choose payment method: (1) Cash or (2) Card");
          int paymentMethod = input.nextInt();
if (paymentMethod == 2) {
total += total * HST;
     }
System.out.println("Total amount to pay: $" + total);
     }
}
```