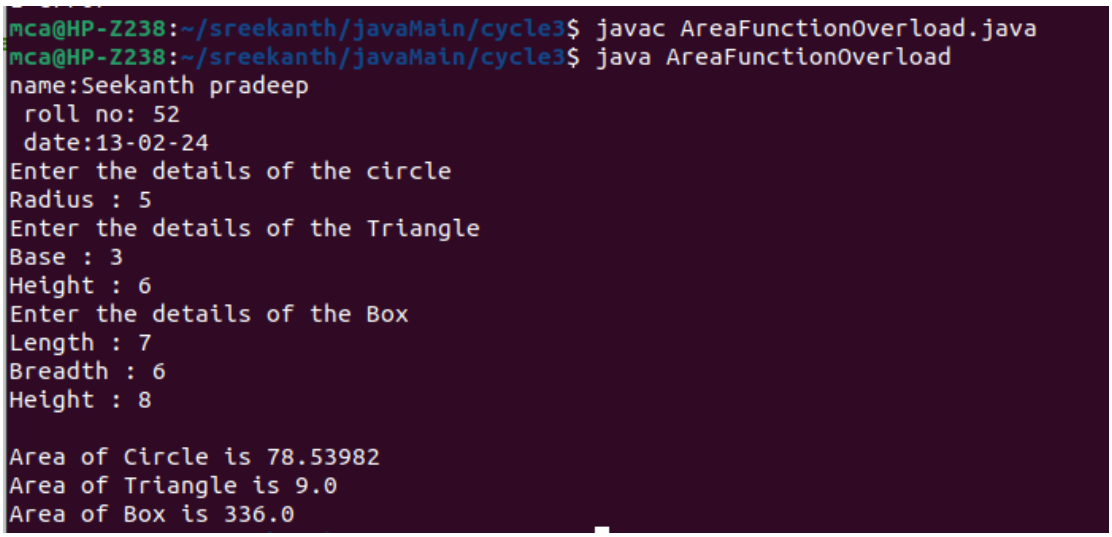
10. Area of different shapes using overloaded functions.

Source Code :

```
import java.util.Scanner;

class Area{
float area(float radius){
return (float)Math.PI*(radius*radius);
}
float area(float base, float height){
return (float)0.5*base*height;
}
float area(float length, float breadth, float height){
return length*breadth*height;
}
}
class AreaFunctionOverload{
public static void main(String[] args){
System.out.println("name:Seekanth pradeep\n roll no: 52\n date:13-02-24");

Scanner scanner = new Scanner(System.in);
float radius, base, length, breadth, height;
Area area = new Area();

System.out.println("Enter the details of the circle");
System.out.print("Radius : ");
radius = scanner.nextFloat();
float areaOfCircle = area.area(radius);

System.out.println("Enter the details of the Triangle");
System.out.print("Base : ");
base = scanner.nextFloat();
System.out.print("Height : ");
height = scanner.nextFloat();
float areaOfTriangle = area.area(base, height);

System.out.println("Enter the details of the Box");
System.out.print("Length : ");
length = scanner.nextFloat();
System.out.print("Breadth : ");
breadth = scanner.nextFloat();
System.out.print("Height : ");
```

```
height = scanner.nextFloat();
float areaOfBox = area.area(length, breadth, height);

System.out.println("\nArea of Circle is " + areaOfCircle);
System.out.println("Area of Triangle is " + areaOfTriangle);
System.out.println("Area of Box is " + areaOfBox);

scanner.close();
}
}
```

Output:



11. Create a class 'Employee' with data members Empid, Name, Salary, Address and constructors to initialize the data members. Create another class 'Teacher' that inherit the properties of class employee and contain its own data members department, Subjects taught and constructors to initialize these data members and also include display function to display all the data members. Use array of objects to display details of N teachers.

Source Code :

```
import java.util.Scanner;

class Employee {
public int Empid, Salary;
public String Name, Address;

public Employee(int Empid, String Name, int Salary, String Address) {
this.Empid = Empid;
this.Name = Name;
this.Salary = Salary;
this.Address = Address;
}
}
class Teacher extends Employee {
String Department, Subject;

public Teacher(int Empid, String Name, int Salary, String Address, String Department,
String Subject) {
super(Empid, Name, Salary, Address);
this.Department = Department;
this.Subject = Subject;
}
void Display(){
System.out.println("\nEmpolyee id : " + super.Empid);
System.out.println("Empolyee name : " + super.Name);
System.out.println("Empolyee salary : " + super.Salary);
System.out.println("Empolyee address : " + super.Address);
System.out.println("Department : " + this.Department);
System.out.println("Subject taught : " + this.Subject);
}
}
class Main {
```

```
public static void main(String args[]){
System.out.println("name:Seekanth pradeep\n roll no: 52\n date:13-02-24");
Scanner scanner = new Scanner(System.in);

System.out.print("Enter the no.of Teachers : ");
int n = scanner.nextInt();
Teacher []arr = new Teacher[n];
System.out.println("Enter the details ");
for(int i=0; i< n; i++){
System.out.println("Enter the details of Teacher " + i+1 + " : ");
System.out.print("id : ");
int id = scanner.nextInt();
System.out.print("name : ");
scanner.nextLine();
String name = scanner.nextLine();
System.out.print("salary : ");
int salary = scanner.nextInt();
System.out.print("Address : ");
scanner.nextLine();
String address = scanner.nextLine();
System.out.print("Department : ");
String department = scanner.nextLine();
System.out.print("Subject : ");
String subject = scanner.nextLine();
arr[i] = new Teacher(id, name, salary, address, department, subject);
}
System.out.println("\nDetials\n");
for(int i =0; i< n; i++){
arr[i].Display();
}
scanner.close();
}
}
```

Output :

```
mca@HP-Z238:~/sreekanth/javaMain/cycle3$ javac Employee.java
mca@HP-Z238:~/sreekanth/javaMain/cycle3$ java Main
name:Seekanth pradeep
 roll no: 52
 date:13-02-24
Enter the no.of Teachers : 2
Enter the details
Enter the details of Teacher 01 :
id : 1
name : sruthi
salary : 50000
Address : abcd
Department : mca
Subject : os
Enter the details of Teacher 11 :
id : 2
name : sreya
salary : 50000
Address : vbvg
Department : mca
Subject : ds

Detials


Empolyee id : 1
Empolyee name : sruthi
Empolyee salary : 50000
Empolyee address : abcd
Department : mca
Subject taught : os

Empolyee id : 2
Empolyee name : sreya
Empolyee salary : 50000
Empolyee address : vbvg
Department : mca
Subject taught : ds
```

12.Create a class 'Person' with data members Name, Gender, Address, Age and a constructor to initialize the data members and another class 'Employee' that inherits the properties of class Person and also contains its own data members like Empid, Company_name, Qualification, Salary and its own constructor. Create another class 'Teacher' that inherits the properties of class Employee and contains its own data members like Subject, Department, Teacherid and also contain constructors and methods to display the data members. Use array of objects to display details of N teachers.

Source Code :

```
import java.util.Scanner;

class Person {
String name, gender, address;
int age;

public Person(String name, String gender, String address, int age){
this.name = name;
this.gender = gender;
this.address = address;
this.age = age;
}
void display(){
System.out.println("Name: " + name + "\nGender: " + gender + "\nAddress: " + address
+ "\nAge: " + age);
}
}

class Employee extends Person {
int empId, salary;
String companyName, qualification;

public Employee(int empId, String companyName, String qualification, int salary, String
name, String gender, String address, int age){
super(name, gender, address, age);
this.empId = empId;
this.companyName = companyName;
this.qualification = qualification;
this.salary = salary;
}
```

```
void display(){
System.out.println("Employee Id : " + empId + "\nCompany name : " + companyName
+ "\nQualification : " + qualification + "\nSalary : " + salary);
super.display();
}
}

class Teacher extends Employee {
int teacherId;
String subject, department;

public Teacher (int teacherId, String subject, String department, int empId, String
companyName, String qualification, int salary, String name, String gender, String
address, int age){
super(empId, companyName, qualification, salary, name, gender, address, age);
this.teacherId = teacherId;
this. subject = subject;
this.department = department;
}
void display(){
System.out.println("Teacher Id : " + teacherId + "\nDepartment : " + department +
"\nSubject : " + subject);
super.display();
}
}

class PersonMain {
public static void main(String[] arg){
System.out.println("name:Seekanth pradeep\n roll no: 52\n date:13-02-24");

Scanner scanner = new Scanner(System.in);
System.out.print("Enter the no.of Teachers : ");
int TeacherCount = scanner.nextInt();

Teacher [] Teachers = new Teacher[TeacherCount];
for (int i=0; i<TeacherCount; i++) {
System.out.println("\nEnter the Teacher details");
System.out.print("Enter the Teacher id : ");
int id = scanner.nextInt();
System.out.print("Enter the Subject : ");
scanner.nextLine();
String subject = scanner.nextLine();
System.out.print("Enter the Department : ");
String department = scanner.nextLine();
```

```
System.out.print("Enter the Employee id : ");
int empId = scanner.nextInt();
System.out.print("Enter the Company name : ");
scanner.nextLine();
String companyName = scanner.nextLine();
System.out.print("Enter the Qualification : ");
String qualification = scanner.nextLine();
System.out.print("Enter the Salary : ");
int salary = scanner.nextInt();
System.out.print("Enter the Name : ");
scanner.nextLine();
String name = scanner.nextLine();
System.out.print("Enter the Gender : ");
String gender = scanner.nextLine();
System.out.print("Enter the Address : ");
String address = scanner.nextLine();
System.out.print("Enter the Age : ");
int age = scanner.nextInt();

Teachers[i] = new Teacher(id, subject, department, empId, companyName, qualification,
salary, name, gender, address, age);
}
for (int i=0; i<TeacherCount; i++){
System.out.println("\nDetails of Teacher " + (i+1));
Teachers[i].display();
}

scanner.close();
}
}
```

Output:

```
mca@HP-Z238:~/sreekanth/javaMain/cycle3$ javac person.java
mca@HP-Z238:~/sreekanth/javaMain/cycle3$
mca@HP-Z238:~/sreekanth/javaMain/cycle3$ javac person.java
mca@HP-Z238:~/sreekanth/javaMain/cycle3$ java PersonMain
name:Seekanth pradeep
 roll no: 52
 date:13-02-24
Enter the no.of Teachers : 2

Enter the Teacher details
Enter the Teacher id : 101
Enter the Subject : os
Enter the Department : mca
Enter the Employee id : 10
Enter the Company name : infosys
Enter the Qualification : mca
Enter the Salary : 60000
Enter the Name : amal
Enter the Gender : male
Enter the Address : jfjf
Enter the Age : 26

Enter the Teacher details
Enter the Teacher id : 102
Enter the Subject : network
Enter the Department : mca
Enter the Employee id : 11
Enter the Company name : tcs
Enter the Qualification : phd
Enter the Salary : 90000
Enter the Name : ajay
Enter the Gender : male
Enter the Address : dkdk
Enter the Age : 27

Details of Teacher 1
Teacher Id : 101
Department : mca
Subject : os
Employee Id : 10
Company name : infosys
Qualification : mca
Salary : 60000
Name: amal
Gender: male
```

13. Write a program has class Publisher, Book, Literature and Fiction. Read the information and print the details of books from either the category, using inheritance.

Source Code :

```
import java.util.Scanner;

class Publisher {
String author, company, date;

public Publisher(String author, String company, String date){
this.author = author;
this.company = company;
this.date = date;
}
}
class Book extends Publisher {
String name, language;
int price;

public Book(String name, String language, int price, String author, String company,
String date){
super(author, company, date);
this.name = name;
this.language = language;
this.price = price;
}
}
class Literature extends Book {
String category = "literature";
String title;

public Literature(String name, String language, int price, String author, String company,
String date){
super(name, language, price, author, company, date);
}
void display(){
System.out.println("\nName : " + name + "\nCategory : " + category + "\nLanguage : " +
language + "\nPrice : " + price + "\nAuthor : " + author + "\nCompany : " + company +
"\nDate : " + date);
}
```

```
}
class Fiction extends Book {
String category = "fiction";
String title;

public Fiction(String name, String language, int price, String author, String company,
String date){
super(name, language, price, author, company, date);
}
void display(){
System.out.println("\nName : " + name + "\nCategory : " + category + "\nLanguage : " +
language + "\nPrice : " + price + "\nAuthor : " + author + "\nCompany : " + company +
"\nDate : " + date);
}
}
class BookMain {
public static void main(String[] arg) {
System.out.println("name:Seekanth pradeep\n roll no: 52\n date:8-04-24");
Scanner scanner = new Scanner(System.in);
String name, language, author, company, date;
int price;
System.out.print("Enter the total number of books : ");
int MAX = scanner.nextInt();
Literature arr1[] = new Literature[MAX];
Fiction arr2[] = new Fiction[MAX];
int i = 0, j = 0;
boolean status = true;
while(status && i+j < MAX){
System.out.print("\nCATEGORY\n----------
\n1)Literature\n2)Fiction\n\nOPERATIONS\n----------\n3)Display\n4)Exit\nChoose
one : ");
int choice = scanner.nextInt();
switch(choice){
case 1 :
System.out.println("\nEnter the Details of the book " + (i+j+1));
System.out.print("Name : ");
scanner.nextLine();
name = scanner.nextLine();
System.out.print("Language : ");
language = scanner.nextLine();
System.out.print("Price : ");
price = scanner.nextInt();
System.out.print("Author : ");
scanner.nextLine();
```

```
author = scanner.nextLine();
System.out.print("Publishing company : ");
company = scanner.nextLine();
System.out.print("Date : ");
date = scanner.nextLine();
arr1[i++] = new Literature(name, language, price, author, company, date);
break;
case 2 :
System.out.println("\nEnter the Details of the book " + (i+j+1));
System.out.print("Name : ");
scanner.nextLine();
name = scanner.nextLine();
System.out.print("Language : ");
language = scanner.nextLine();
System.out.print("Price : ");
price = scanner.nextInt();
System.out.print("Author : ");
scanner.nextLine();
author = scanner.nextLine();
System.out.print("Publishing company : ");
company = scanner.nextLine();
System.out.print("Date : ");
date = scanner.nextLine();
arr2[j++] = new Fiction(name, language, price, author, company, date);
break;
case 3 :
for(int k=0; k<i; k++){
System.out.println("\nDetials of book " + (k+1));
arr1[k].display();
}
for(int k=0; k<j; k++){
System.out.println("\nDetials of book " + (k+i+1));
arr2[k].display();
}
break;
case 4 :
status = false;
break;
default : System.out.println("Invalid choise.");
}
}
if((i+j) >= MAX){
for(int k=0; k<i; k++){
System.out.println("\nDetials of book " + (k+1));
```

```
arr1[k].display();
}
for(int k=0; k<j; k++){
System.out.println("\nDetials of book " + (k+i+1));
arr2[k].display();
}
}
scanner.close();
}
}
```

Output :

```
mca@HP-Z238:~/sreekanth/javaMain/cycle3$ javac Book.java
mca@HP-Z238:~/sreekanth/javaMain/cycle3$ java BookMain
name:Seekanth pradeep
 roll no: 52
 date:8-04-24
Enter the total number of books : 3

CATEGORY
---------------
1)Literature
2)Fiction

OPERATIONS
---------------
3)Display
4)Exit
Choose one : 1

Enter the Details of the book 1
Name : making india awesome
Language : emglish
Price : 1200
Author : chetan bhagat
Publishing company : indian publications
Date : 20-03-10

CATEGORY
---------------
1)Literature
2)Fiction

OPERATIONS
---------------
3)Display
4)Exit
Choose one : 2

Enter the Details of the book 2
Name : the alchemist
Language : portugese
Price : 1000
Author : paulo coelho
Publishing company : harpertorch
```

```
Publishing company : harpertorch
Date : 1988

CATEGORY
---------------
1)Literature
2)Fiction

OPERATIONS
---------------
3)Display
4)Exit
Choose one : 3

Detials of book 1

Name : making india awesome
Category : literature
Language : emglish
Price : 1200
Author : chetan bhagat
Company : indian publications
Date : 20-03-10

Detials of book 2

Name : the alchemist
Category : fiction
Language : portugese
Price : 1000
Author : paulo coelho
Company : harpertorch
Date : 1988

CATEGORY
---------------
1)Literature
2)Fiction

OPERATIONS
---------------
3)Display
4)Exit
Choose one : 4
```

14. Create classes Student and Sports. Create another class Result inherited from Student and Sports. Display the academic and sports score of a student

Source Code :

```
import java.util.Scanner;

class Student {
String name, academicScore;
public Student(String name, String academicScore){
this.name = name;
this.academicScore = academicScore;
}
void display(){
System.out.println("Student name : " + name + "\nAcademic Score : " + academicScore);
}
}
interface Sports  {
void displaySportsScore();
}
class Result extends Student implements Sports {
String sportsName, sportsScore;

public Result(String name, String academicScore, String sportsName, String
sportsScore){
super(name, academicScore);
this.sportsName = sportsName;
this.sportsScore = sportsScore;
}
public void displaySportsScore(){
System.out.println("Sports name : " + sportsName + "\nSports Score : " + sportsScore);
}
void display(){
System.out.println("\nStudent Details");
super.display();
displaySportsScore();
}
}
class ResultDetails {
public static void main(String [] args){
System.out.println("name:Seekanth pradeep\n roll no: 52\n date:8-04-24");
```

```
Scanner scanner = new Scanner(System.in);

System.out.println("Enter the Details of the student");
System.out.print("name : ");
String name = scanner.nextLine();
System.out.print("academic score : ");
String academicScore = scanner.nextLine();
System.out.print("sports name : ");
String sportsName = scanner.nextLine();
System.out.print("sports score : ");
String sportsScore = scanner.nextLine();
Result object = new Result(name, academicScore, sportsName, sportsScore);
object.display();

scanner.close();
}
}
```

Output :

```
mca@HP-Z238:~/sreekanth/javaMain/cycle3$ javac ResultDetails.java
mca@HP-Z238:~/sreekanth/javaMain/cycle3$ java  ResultDetails
name:Seekanth pradeep
 roll no: 52
 date:8-04-24
Enter the Details of the student
name : sreekanth
academic score : 90
sports name : cricket
sports score : 123

Student Details
Student name : sreekanth
Academic Score : 90
Sports name : cricket
Sports Score : 123
```

15. Create an interface having prototypes of functions area() and perimeter(). Create two classes Circle and Rectangle which implements the above interface. Create a menu driven program to find area and perimeter of objects.

Source Code :

```
import java.util.Scanner;

interface MathUtils {
void area();
void perimeter();
}
class Circle implements MathUtils {
double pi = 3.141;
double radius;

public Circle(double radius){
this.radius = radius;
}
public void area(){
double area = pi * radius * radius;
System.out.println("\narea of circle : " + area);
}
public void perimeter(){
double perimeter = 2 * pi * radius;
System.out.println("perimeter of circle : " + perimeter);
}
}
class Rectangle implements MathUtils {
double length;
double width;

public Rectangle(double length, double width){
this.length = length;
this.width = width;
}
public void area(){
double area = length * width;
System.out.println("\narea of rectangle : " + area);
}
public void perimeter(){
```

```
double perimeter = 2 * (length + width);
System.out.println("perimeter of rectangle : " + perimeter);
}
}
public class AreaAndPerimeter {
public static void main(String [] arg){
System.out.println("name:Seekanth pradeep\n roll no: 52\n date:8-04-24");
Scanner scanner = new Scanner(System.in);
boolean status = true;
while(status){
System.out.print("\nSHAPES\n----------\n1) Rectangle\n2) Circle\n3) exit\nChoose
one : ");
int choice = scanner.nextInt();
switch(choice){
case 1:
System.out.println("\nEnter the details of Rectangle.");
System.out.print("length : ");
double length = scanner.nextInt();
System.out.print("width : ");
double width = scanner.nextInt();
Rectangle rect = new Rectangle(length, width);
rect.area();
rect.perimeter();
break;
case 2:
System.out.println("\nEnter the details of Circle.");
System.out.print("radius : ");
double radius = scanner.nextInt();
Circle cir = new Circle(radius);
cir.area();
cir.perimeter();
break;
case 3:
status = false;
break;
}
}
scanner.close();
}
}
```

Output :

```
Choose one : 3
mca@HP-Z238:~/sreekanth/javaMain/cycle3$ javac AreaAndPerimeter.java
mca@HP-Z238:~/sreekanth/javaMain/cycle3$ java AreaAndPerimeter
name:Seekanth pradeep
 roll no: 52
 date:8-04-24

SHAPES
------------
1) Rectangle
2) Circle
3) exit
Choose one : 1

Enter the details of Rectangle.
length : 4
width : 3

area of rectangle : 12.0
perimeter of rectangle : 14.0

SHAPES
------------
1) Rectangle
2) Circle
3) exit
Choose one : 2

Enter the details of Circle.
radius : 4

area of circle : 50.256
perimeter of circle : 25.128

SHAPES
------------
1) Rectangle
2) Circle
3) exit
Choose one : 3
```

16. Prepare bill with the given format using calculate method from interface.

+
Order No.
Date :

Product Id	Name	Quantity	unit price	Total
101	A	2	25	50
102	B	1	100	100
			Net. Amount	150

Source Code :

```
import java.util.Scanner;

interface Calculate {
void calculate();
}
class Product {
int id, quantity, unitPrice, total;
String name;

Product(int id, String name, int quantity, int unitPrice){
this.id = id;
this.name = name;
this.quantity = quantity;
this.unitPrice = unitPrice;
this.total = quantity * unitPrice;
}
}
class Order implements Calculate {
int orderNo;
String orderDate;
int netAmt;
int i = 0;
Product [] list = new Product[20];

Order(int orderNo, String orderDate){
this.orderNo = orderNo;
this.orderDate = orderDate;
```

```
}
void add(int id, String name, int quantity, int unitPrice){
list[i++] = new Product(id, name, quantity, unitPrice);
}
public void calculate(){
netAmt = 0;
for(int k=0; k<i; k++){
netAmt += list[k].total;
}
this.display();
}
void display(){
System.out.println("\nOrder no. : " + orderNo + "\nDate : " + orderDate);
System.out.println("Product id    Name    Quantity    Unit price    Total\n----------
----------------------------------");
for(int k=0; k<i; k++){
System.out.println(list[k].id + "          " + list[k].name + "   " + list[k].quantity + "
" + list[k].unitPrice + "           " + list[k].total);
}
if(i==0) System.out.println("No product added.");
System.out.println("-----------------------------------------------------\n
Net.Amount    " + netAmt);
}
}
public class Bill {
public static void main(String [] arg){
System.out.println("name:Seekanth pradeep\n roll no: 52\n date:8-04-24");

Scanner scanner = new Scanner(System.in);

System.out.print("Enter the order no : ");
int orderNo = scanner.nextInt();
System.out.print("Enter the order date : ");
scanner.nextLine();
String orderDate = scanner.nextLine();
Order order = new Order(orderNo, orderDate);
boolean status = true;
while(status){
System.out.print("\nOPERATIONS\n-------------------\n1) Add product\n2) Calculate
total\n3) Exit\n-------------------\nChoose one : ");
int choice = scanner.nextInt();
switch(choice){
case 1:
System.out.print("\nEnter the product id : ");
```

```
int id = scanner.nextInt();
System.out.print("Enter the product name : ");
scanner.nextLine();
String name = scanner.nextLine();
System.out.print("Enter the product quantity : ");
int quantity = scanner.nextInt();
System.out.print("Enter the product unit price : ");
int unitPrice = scanner.nextInt();
order.add(id, name, quantity, unitPrice);
break;
case 2:
order.calculate();
break;
case 3:
status = false;
break;
default:
System.out.println("\nInvalid choice.\n");
}
}

scanner.close();
}
}
```

Output :

```
mca@HP-Z238:~/sreekanth/javaMain/cycle3$ javac Bill.java
mca@HP-Z238:~/sreekanth/javaMain/cycle3$ java Bill
name:Seekanth pradeep
 roll no: 52
 date:8-04-24
Enter the order no : 1234
Enter the order date : 6/04/2024

OPERATIONS
------------------
1) Add product
2) Calculate total
3) Exit
------------------
Choose one : 1

Enter the product id : 23
Enter the product name : dgf
Enter the product quantity : 6
Enter the product unit price : 150

OPERATIONS
------------------
1) Add product
2) Calculate total
3) Exit
------------------
Choose one : 1

Enter the product id : 13
Enter the product name : ghj
Enter the product quantity : 10
Enter the product unit price : 270

OPERATIONS
------------------
1) Add product
2) Calculate total
3) Exit
------------------
Choose one : 2

Order no. : 1234
```

```
Order no. : 1234
Date : 6/04/2024
Product id    Name    Quantity    Unit price    Total
-----------------------------------------------------
23            dgf   6            150             900
13            ghj   10            270             2700
-----------------------------------------------------
                                  Net.Amount    3600

OPERATIONS
-------------------
1) Add product
2) Calculate total
3) Exit
-------------------
Choose one : 3
```