



Programming 1 (STIA1113)

ASSIGNMENT 3 TOPIC :

COMMUNICATION

(INTERNET, MOBILE PHONE, LAPTOP, SATELLITE, TV)

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1.0 INTERNET

UNDERSTAND THE PROBLEM

The Internet protocol suite (TCP/IP) is used to communicate between networks and devices in a global system of interconnected computer networks. It is a community of network made up of neighborhood to world private, public, academic, business and government networks linked through range of electrical, wireless and optical networking technologies. The Internet has reshaped, redefined or even bypassed most regular conversation media such as telephone, radio, television, paper mail, and newspapers, resulting in new services such as email, smartphone, smart TV, online music, digital newspaper and video streaming websites. Newspapers, books and other forms of print media are adapting to website technological know-how or converted into blogging, network feeds and online new aggregators.

Internet is used for communications which in general, Internet users hold the Internet in high regard as a communication tool; 85% of men and women agree that the Internet is a good means to engage or communicate with others in their daily lives. However, that's where the parallel end. Men and women engage in other way online, in terms of how they communicate, what they communicate about and how essential their online communications are to them. Besides, all Internet customers maintain their net in excessive regard as a source of fact. Internet is the right supply of information for day-today pursuits like news, weather reports and sport activities score, in accordance to nearly all Internet customers. The identical variety of people say they assume to discover statistics about unique products they choose to buy, with men (82%) outnumbering women (77%) in this category. 1/3 web customers say they expect to find sincere information about people on the Internet.

IDENTIFY PROBLEM

A slow connection makes it harder for people to upload file or even to surf the Internet. This might happen because they did not notice that they have insufficient amount of Internet usage. Connection velocity is principally decided by using the kind of Internet connection human have. There are numbers of common techniques for connecting to the Internet. For example, Internet connection via Wireless Network (WIFI) which is a wireless networks use frequencies like those used by other devices such as microwave ovens and cordless phones. FiOS (Fiber Optic Service) connects to the Internet via an optical network. FiOS is more likely to be available in densely populated areas. This sort of trouble gets worse especially in a household

with quite a lot of family members with the usage of only one Wi-Fi, village, or rural area. Students with online lessons have a hard time to have exact Internet connections. Even people who have proper Internet connections have issues to do work when tons of Internet data drainage happen again.

ALTERNATIVE WAYS

1. Use data saver to prevent consuming too much Internet data.
2. Disconnect any unactive devices to prevent Internet from stuck or factor in future growth in bandwidth requirements.
3. to get information on your daily data usage to control your data usage efficiently.

BEST WAYS

A system is created to show users how much data they have been using in their daily lives. By entering the amount of data in megabytes, the user can access information on how much data has been used per minute, hour, and month. The user is also given the option of either getting extra information on how much data has been used for various activities such as uploading or downloading photos, streaming videos, listening to songs, and many more, or skipping the extra information and reviewing the system again with a different amount of data.

INSTRUCTIONS FOR SELECTED SOLUTION

1. A method named *mainMenu()* is used to represent a quick instruction which will appear on the main menu where the user can check daily data usage and also get additional information below.
2. User need to enter the data in megabytes and fill in the times in minutes, hours, and months.
3. Using the formula provided, the programme will calculate the amount, total, and average of data usage that has been entered.
4. Control structure selection (if and else statement) is used in which a message is presented and the user is given the option of receiving extra information or not by entering 'Y' which defines yes and 'N' which defines no. If the user enters 'N,' the system will end with the message "Thankyou!". This statement is included in a method called *extraInformation()*

5. If the user enters 'Y,' the system provides various activities in accordance with the arrangement illustrated below:

- a) Uploading and downloading photo
- b) Streaming videos (standard definition and high definition)
- c) Listening to songs
- d) Sending emails
- e) Web surfing
- f) Online gaming
- g) Social networking

6. All of the activities given are separated into different methods.

7. If and else statement is also used, allowing the user to can choose whether or not gain knowledge about the data usage for the specified activity. If user enters 'Y,' the system will prompt the user to enter the quantity of the item. If the user enters 'N,' the system skips the activity and asks the same question to the next one.

8. Array is used to show the list of data usage calculated based on the activities above.

8. The do..while loop is used to determine whether or not the user want to try again . If the user enters 'Y,' the system restarts and the user can enter a different amount of data. If the user enters 'N,' the system will end with the message "Thankyou."

EVALUATE SOLUTION

Based on the solution given, user need to control their Internet usage to maintain a good Wi-fi connection where they can do lots of activities without needing to be frustrated for having a weak Wi-fi connection. It is also more convinient for user to choose the option given without any problem to check out the data usage.

1.5 CALCULATION TABLE

No.	Type of Calculation	Formula	Example
1.	To calculate the data usage per minutes, data usage per hour and data usage per months	Data usage = data / time (Data in Megabytes)	Data usage = 5000 / 45 = 111.11
2.	To calculate total data usage	Total data usage = data usage per minutes + data usage per hour + data usage per months	Total data usage = 111.11 + 416.67 + 833.33 = 1361.11
3.	To calculate average data usage	Average data usage = (data usage per minutes + data usage per hour + data usage per months) / 3	Average data usage = (111.11 + 416.67 + 833.33) / 3 = 453.70
4.	To calculate data usage to upload and download photo	Data usage = 5MB * photo	Data usage per photo = 5 * 350 = 1750
5.	To calculate data usage for streaming video	Data usage = 750MB * hours of streaming standard definition video Data usage = 2000MB * hours of streaming high-definition video	Data usage = 750 * 4 = 3000 Data usage = 2000 / 6 = 12000
6.	To calculate data usage for streaming music	Data usage = 6.5MB * total every 4 minutes of songs	Data usage = 6.5 * 12 = 78
7.	To calculate data usage for emailing	Data usage = 0.02MB * email	Data usage = 0.02 * 100 = 2
8.	To calculate data usage for web surfing	Data usage = 18MB * hours of web surfing	Data usage = 18 * 6 = 108
9.	To calculate data usage for online gaming	Data usage = 20MB * hours of online gaming	Data usage = 20 * 16 = 320
10.	To calculate data usage for social networking	Data usage = 51MB * hours of social networking	Data usage = 51 * 8 = 408

ALGORITHM

1. User enter data in megabytes.
2. User enter time in minutes, hours, and months.
3. Calculate data usage per minute = data (megabytes) / minutes

Calculate data usage per hours = data (megabytes) / hours

Calculate data usage per months = data (megabytes) / months

Total data usage = data per minutes + data per hours + data per months

Average data usage = (data per minutes + data per hours + data per months) / 3

4. Output will display data usage per minutes, hours and month, total data usage and average data usage.

5. user enter 'Y' or 'N' to either continue with extra information or end the system.

6. user enter 'Y' or 'N' to know about first activity. If 'Y', user enter number of photo. If 'N', system will skip the activity and will repeat the same statement until last activity.

7. Calculate data usage per photo = 5 x photos

Calculate data usage per hours of standard definition video = 750 x hours

Calculate data usage per hours of high-definition video = 2000 x hours

Calculate data usage per total amount of every 4 minutes of songs = 6.5 x total 4 minutes

Calculate data usage per emails = 0.02 x emails

Calculate hours of web surfing = 18 x hours

Calculate hours of online gaming = 20 x hours

Calculate hours of social networking = 51 x hours

7. Output will display data usage for downloading and uploading photos, streaming standard, and high-definition video, listening to songs, sending emails, web surfing, online gaming, and social networking.

8. User enter 'Y' or 'N' either to try again or end the system. If 'Y', program will start again from above. If 'N' program will end.

PSEUDOCODE

Start

Method mainMenu() :

Output "Main Menu"

Output "Check out you daily data usage here!"

Output "Enter data in megabytes :"

Output "Enter time in minutes :"

Input data usage per minutes

Output “Enter time in hours :”

Input data usage per hours

Output “Enter time in months :”

Input data usage per months

Input total data usage

Input average data usage

Method void extraInformation() :

Output “Here are some extra information!”

Output “You can check how much data has been used for various kind of
activities.”

Output “Try to check it out!”

If (extra == ‘Y’)

Input message

Else

Input Thankyou

Method double photo(double z1):

If (photo == ‘Y’)

Input i1

Data usage per photo = $5*i1$

Input data usage for downloading and uploading photos

Return

Method double video(double z2):

Else if (video == ‘Y’)

Input i2,

Data usage per hour = $750*i2$,

Input data usage for streaming standard definition video

Return

Method double hdv(double z3):

Else if (hdv == 'Y')

Input i3

Data usage per hour = $2000 * i3$

Input data usage for streaming high definition video

Return

Method double song(double z4):

Else if (song == 'Y')

Input i4

Data usage per total of 4 minutes = $6.5 * i4$

Input data usage for listening to songs

Return

Method double email(double z4)

Else if (email == 'Y')

Input i5

Data usage per email = $0.02 * i5$

Input data usage for sending emails

Return

Method double websurfing(double z5):

Else if (web == 'Y')

Input i6

Data usage per hour = $18 * i6$

Input data usage for web surfing

Return

Method double onlinegaming(double z6):

Else if (game == 'Y')

Input i7

Data usage per hour = $20 * i7$

Input data usage for online gaming

Return

Method double socialnetworking(double z8):

```

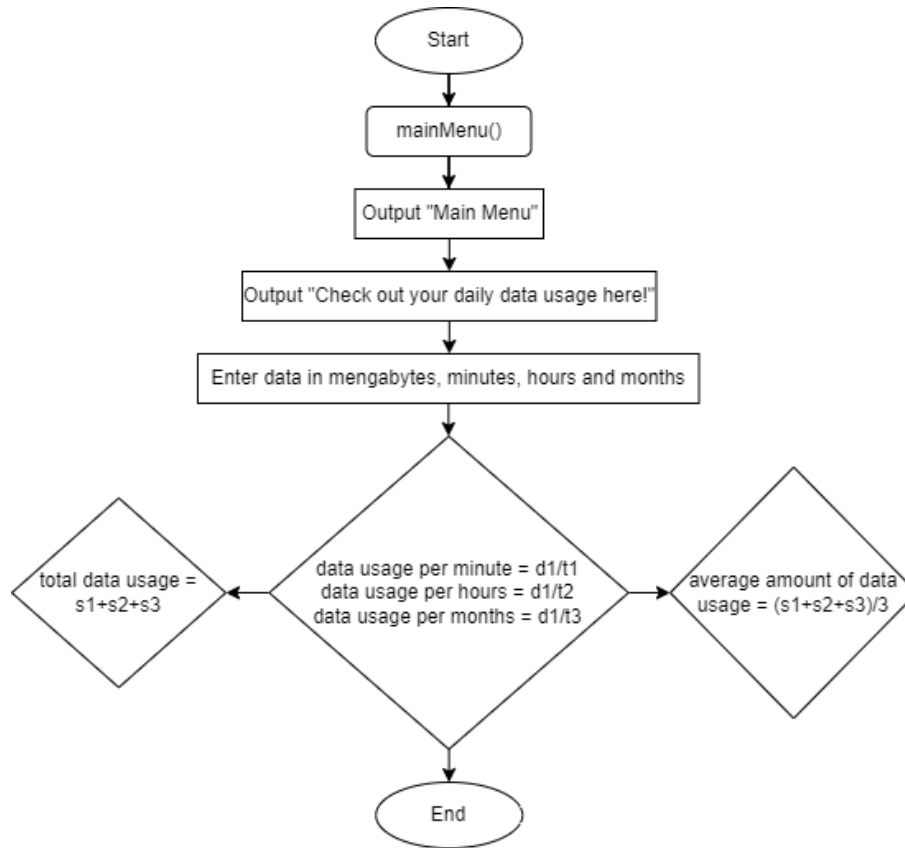
Else if ( social == 'Y')
    Input i8
    Data usage per hour = 51*i8
    Input data usage for social networking
    Return
Method double total(double zp,double zv,double zh,double zs,double ze,double
                    zw,double zo, double zsc):
    Output "Here are the list of data usage for the activities above."
    String[]Array = {"Photo", "Standard definition video","High definition
                    video", "Song", "Email", "Web surfing", "Online gaming",
                    "Social networking"}
    Output Array[0]
    Input zp
    Output Array[1]
    Input zv
    Output Array[2]
    Input zh
    Output Array[3]
    Input zs
    Output Array[4]
    Input ze
    Output Array[5]
    Input zw
    Output Array[6]
    Input zo
    Output Array[7]
    Input zsc
    Else
    Output (" ")
    Do While ( cont == 'Y')
    Output cont

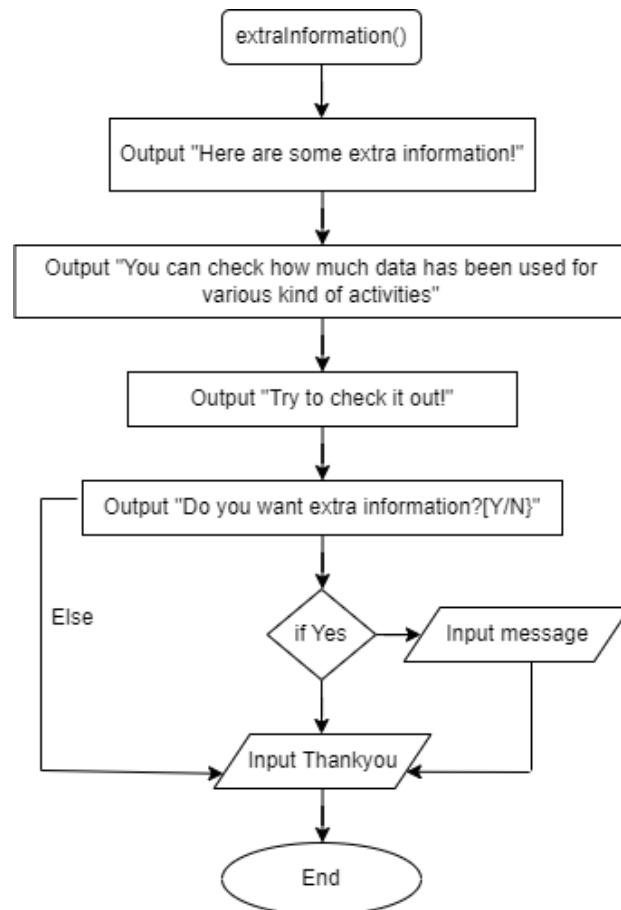
```

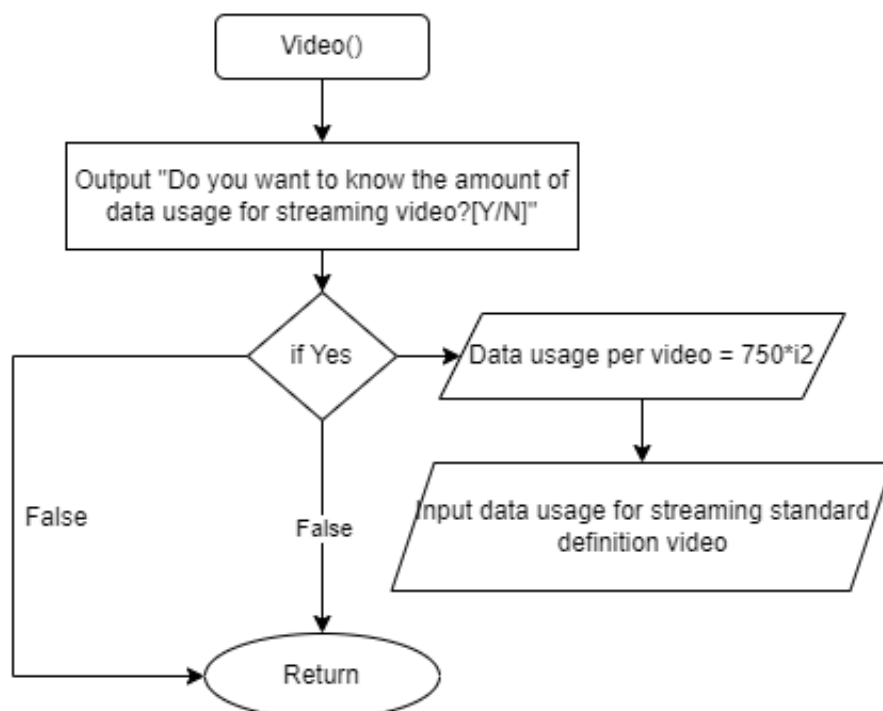
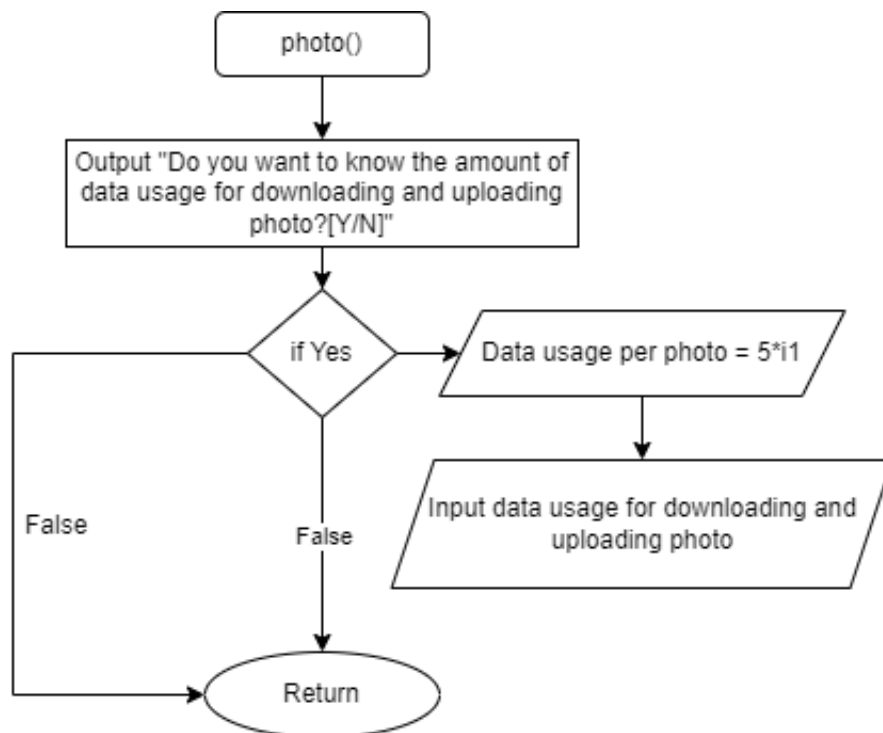
End while

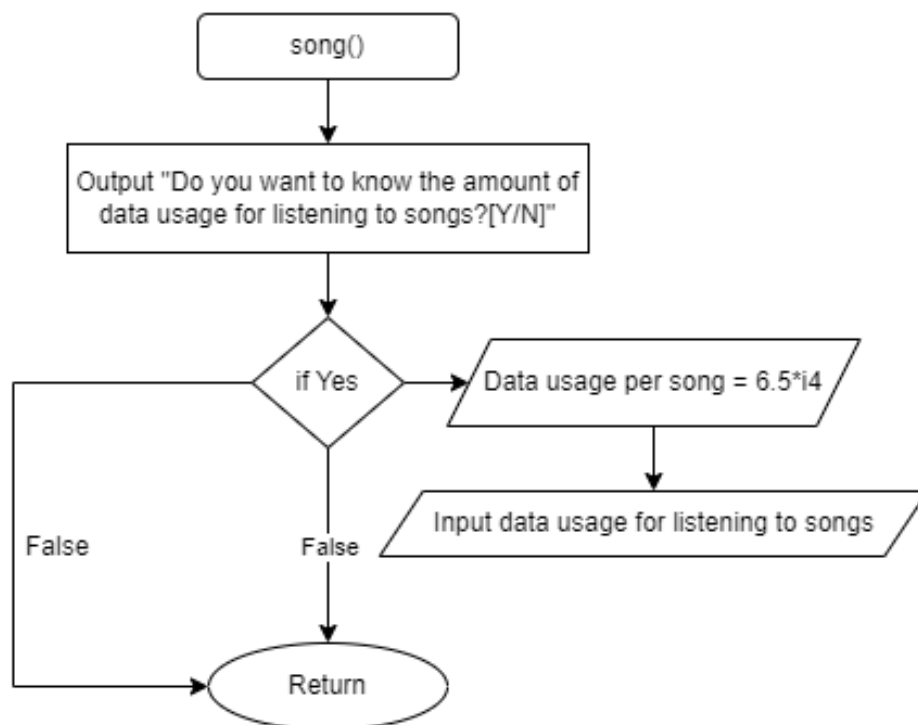
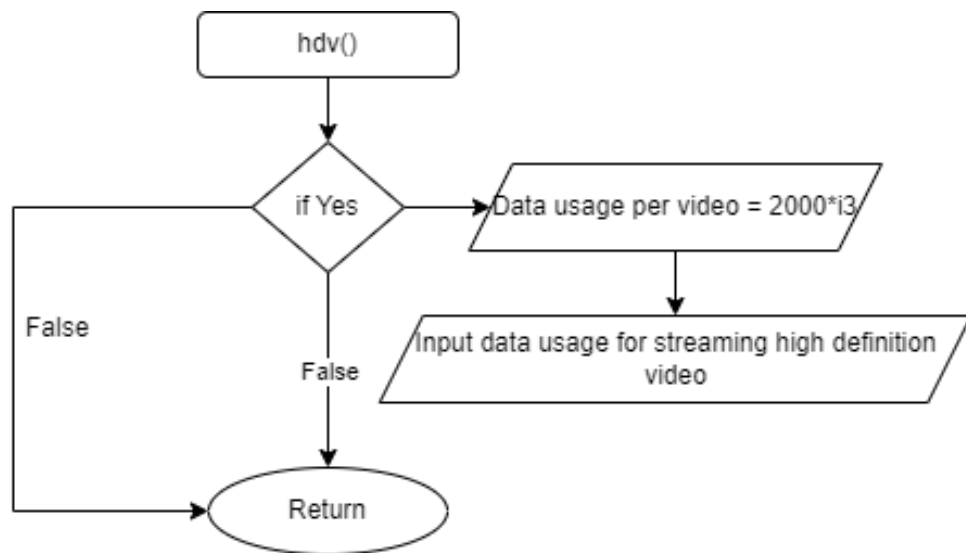
End

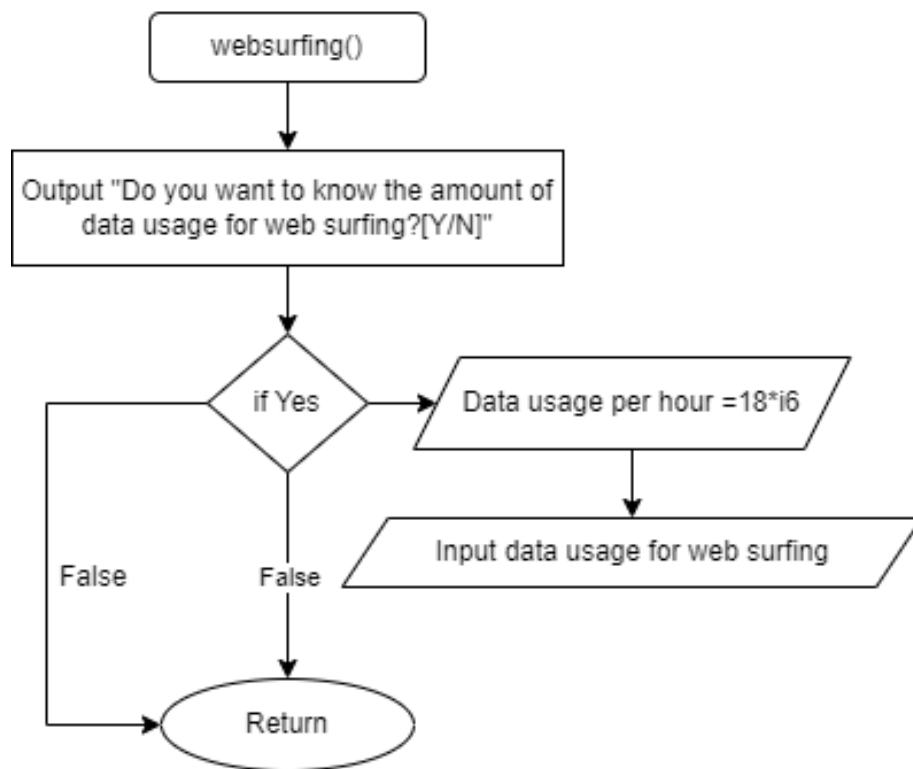
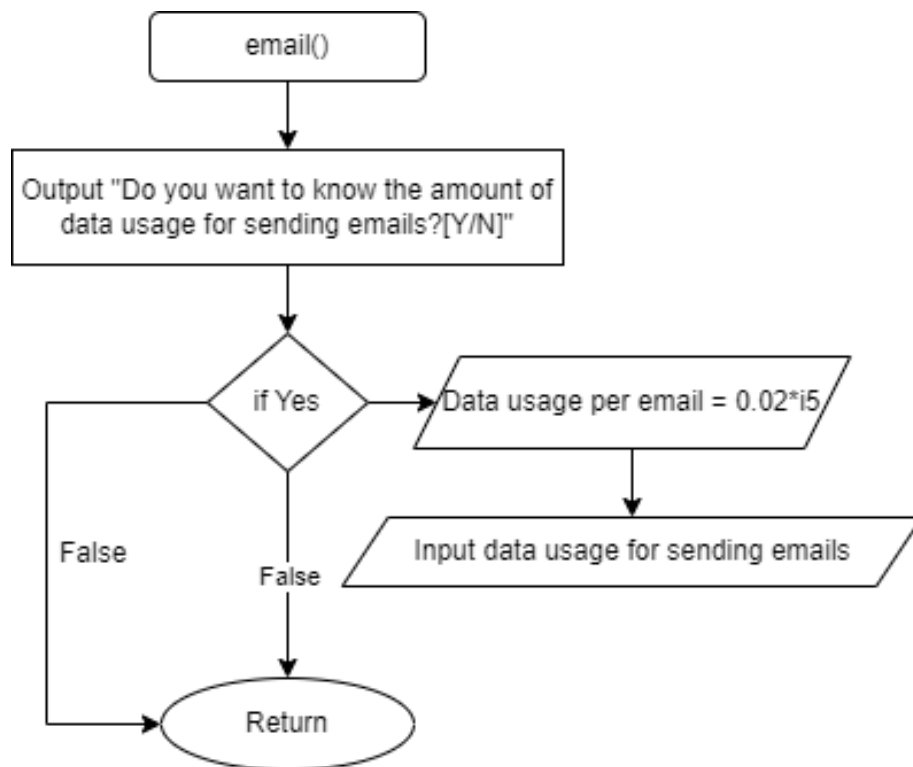
FLOW CHART

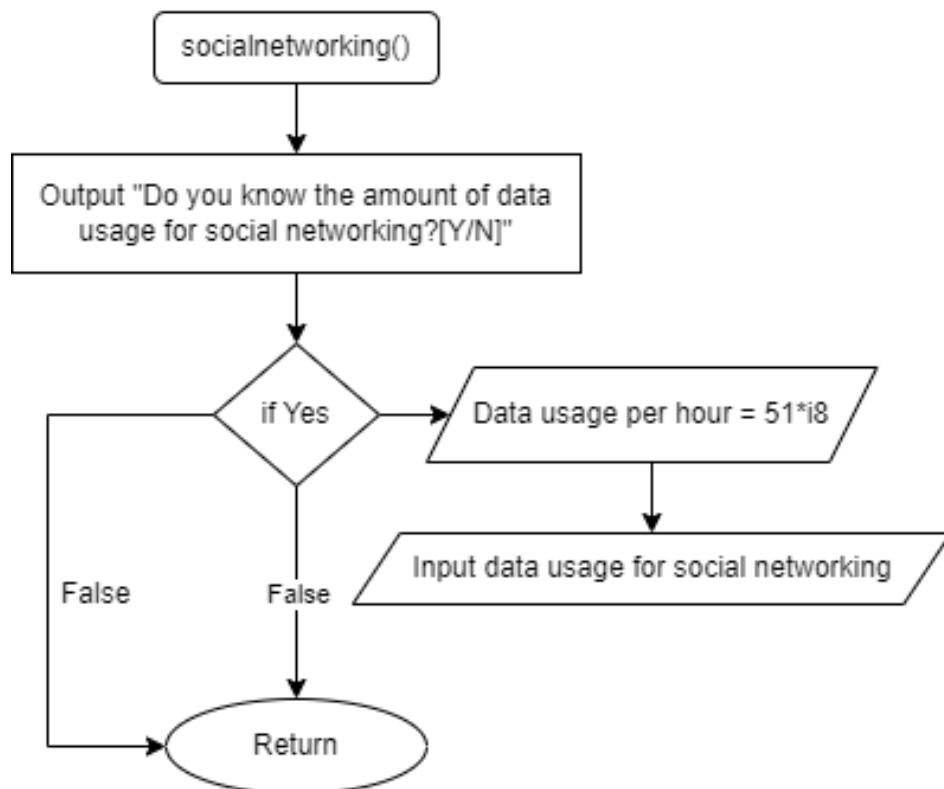
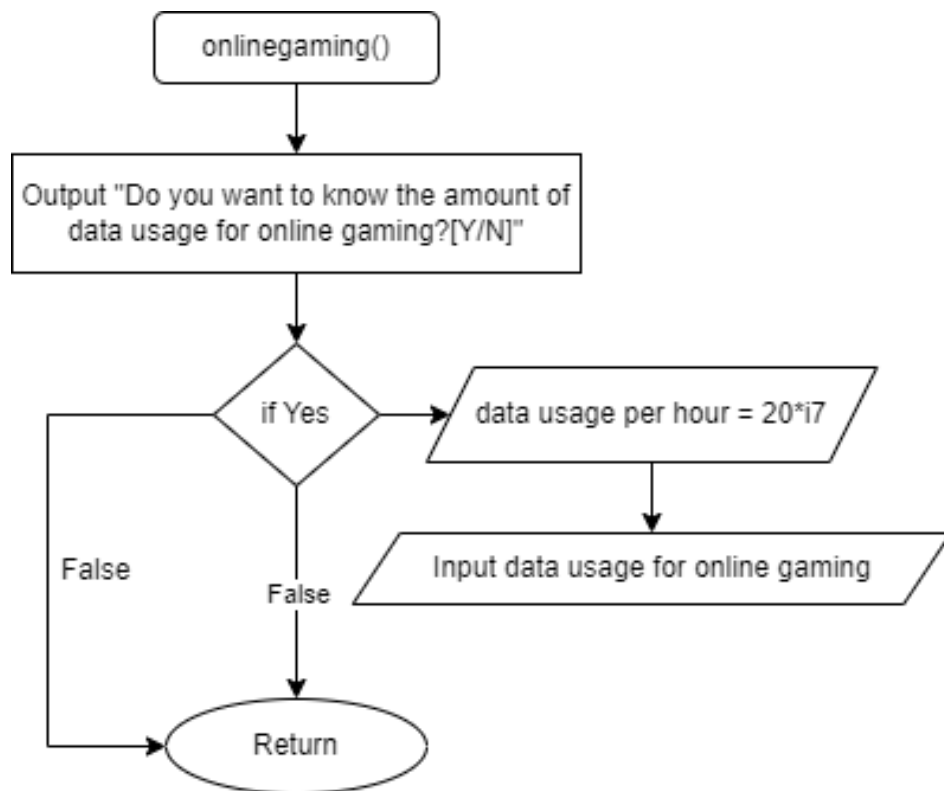


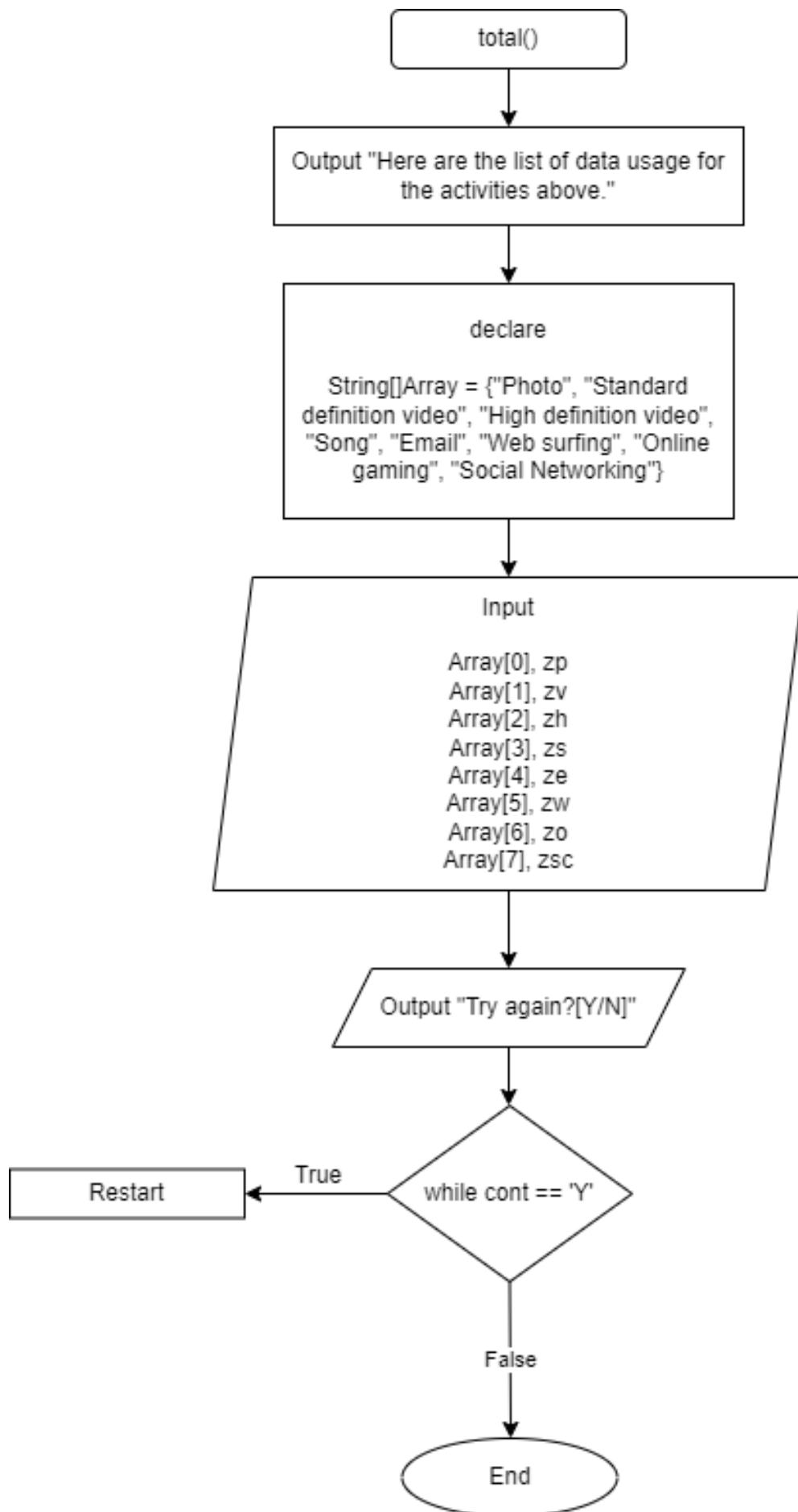












2.0 MOBILE PHONE

UNDERSTAND THE PROBLEM

Mobile phone is a compact phone that can settle on and get decisions over a radio recurrence interface while the client is moving inside a telephone utility region. The radio recurrence interface sets up an association with the exchanging frameworks of a mobile phone administrator, which gives admittance to the public exchanged phone organization (PSTN). Current mobile phone administrations utilize a phone network engineering and in this manner, mobile phones are called cellular telephones or cell phones in North America. Notwithstanding communication, computerized cell phones (2G) support an assortment of different administrations, for example, message informing, MMS, email, Internet access, short-range remote correspondences (infrared, Bluetooth), business applications, computer games and advanced photography. Mobile phones offering just those capacities are known as element telephones; mobile phones which offer extraordinarily progressed figuring abilities are alluded to as mobile phones. Mobile phones were invented as early as the 1940s when engineers working at AT&T developed cells for mobile phone base stations. The first mobile phones were not really mobile phones at all. They were two-way radios that allowed people like taxi drivers and the emergency services to communicate. Mobile phones are important today because they are efficient communication devices and more appearance in our life to make life easier. We can contact our family members or friends in the other places through the mobile phone. We can also use a mobile phone to do other things such as entertainment, doing the job and others. Nowadays, new mobile phone models are constantly engineered to satisfy the needs of consumers and now have multifunctional tools that may be useful in everyday life. So that, the features or configuration in a mobile phone is very important to satisfy the consumers. The accessories of mobile phone also important nowadays. The main purpose of buying cell phone accessories is safety. They also help us take full advantage of our mobile phones. So that, a mobile phone with the best features or configuration and accessories needs to be produced by the factories to the consumers.

IDENTIFY THE PROBLEM

The best features of configuration of a mobile phone need to has the best processor, RAM (Random Access Memory), storage, camera, screen technology and battery. The processor is the central hub of mobile phone such as Snapdragon 888, Snapdragon 855, Exynos 2100 and Kirin 9000. It receives and executes every command, performing billions of calculations per

second. RAM is storage used for a place to hold data and the RAM has different type of storage such as 4, 6 and 8 GB RAM. The storage is like the hard drive in computer to help us to keep our information such as 32 GB, 64 GB, 128 GB, 256 GB and 256 GB storage. The camera can capture photographs and often record video such as 16 MP, 32 MP and 64 MP Camera. The screen technology is enabling the user to interact directly with what is displayed such as AMOLED and IPS. The battery is a small container of chemical energy that support electric to the mobile phone such as 4300 mAh, 5000 mAh and 6400 mAh battery. The accessories like earbuds, screen protector, power bank, charger, and phone case are created to satisfy the consumers. Earbuds such as Jabra Elite 75t Earbuds can help consumers to focus on the listening to the voice message or music when they are using mobile phones. Screen protector like Maxboost Tempered Glass Screen Protector can help consumers to protect their mobile phones' screen safety. Power bank such as iMuto 20,000mah power bank can help consumers to have a moving battery and can use it when their mobile phones are out of battery. So that, a mobile phone accessories and repair shop need to purchase all above things to satisfy consumers when they are visiting to their shop and the consumers can choose the best accessories and configuration by themselves.

ALTERNATIVE WAYS

(a) A program that can help shop owner to purchase the accessories and configurations quickly and calculate the instalment is important that can let the shop owner to save their time. The program will total up the price, calculate the shipping fee and give a discount and then will calculate the instalment for customer for 1 year or 12 months or 2 year or 24 months for paying the payment with the interest rate if customer choose to pay with instalment.

(b) The shop owner goes to the factories to purchase the accessories and configurations by himself.

BEST WAY

A program that can help shop owner to purchase the accessories and configurations quickly and calculate the instalment is important that can let the shop owner to save their time. The program will total up the price, calculate the shipping fee and give a discount and then will calculate the instalment for customer for 1 year or 12 months or 2 year or 24 months for paying the payment with the interest rate if customer choose to pay with instalment.

INSTRUCTIONS FOR SELECTED SOLUTION

1. The consumers key in all the information detail such as name, ic, phone number and address.
2. The program will come out the configuration and accessories flow by flow for consumers to key in the accessories and configurations they want to purchase from the supplier.
3. The configurations and accessories have processor, RAM, storage, camera, screen technology, battery, earbuds, screen protector, power bank, charger, and phone case.
4. The program will get the configuration and accessories that choose by the customers.
5. The program will calculate the price accessories and configuration base on the choose that customer key in on each configuration and accessories.
6. The program will calculate the total price for the consumers
7. The program will calculate the total price after discount
8. The program will calculate the fees that consumers should pay every month if customer choose to pay with instalment
9. The program will print out a receipt for the consumers as the reference.

EVALUATE SOLUTION

The program is easier use by the consumers and they can know how much they should pay and they know they pay for what and this program is saving their time. They will not worry about the performance of the mobile phone because the configuration and the accessories are the best and chosen by them. Besides that, they will also satisfy to their own choices and make a mobile phone's best features or configurations by themselves.

CALCULATION TABLE

Accessories	Price	Weight	Quantity	Formula Price	Formula Weight	Total Price	Total Weight
-------------	-------	--------	----------	------------------	-------------------	----------------	-----------------

Snapdragon 888	RM 2000	0.02 Kg	100	Price of Snapdragon 888 * Quantity 2000 * 100	Weight of Snapdragon 888 * Quantity 0.2 * 100	RM 200000	2 Kg
16 GB Ram	RM 500	0.01Kg	200	Price of 16 GB Ram * Quantity 500 * 200	Weight of 16 GB Ram * Quantity 0.01 * 200	RM 100000	2 Kg
256 GB Storage	RM 400	0.01Kg	150	Price of 256 GB Storage * Quantity 400 * 150	Weight of 256 GB Storage * Quantity 0.01 * 150	RM 60000	1.5 Kg
64 MP Camera	RM 300	0.005Kg	200	Price of 64 MP Camera * Quantity 300 * 200	Weight of 64 MP Camera * Quantity 0.005 * 200	RM 60000	1 Kg
AMOLED	RM 1000	0.015Kg	70	Price of AMOLED * Quantity 10000 * 70	Weight of AMOLED * Quantity 0.015 * 70	RM 70000	1.05Kg
Battery 6000 mAh	Rm 300	0.02Kg	250	Price of Battery 6000	Weight of Battery 6000	RM 75000	5 Kg

				mAh * Quantity 300 *250	mAh * Quantity 0.02 * 250		
Earbuds	RM 100	0.01Kg	200	Price of Earbuds * Quantity 100 * 200	Weight of Earbuds * Quantity 0.01 * 200	RM 20000	2 Kg
Screen Protector	RM 50	0.005K g	50	Price of Screen Protector * Quantity 50 * 50	Weight of Screen Protector * Quantity 0.005 *50	RM 2500	0.25 Kg
Power bank	RM 100	0.5Kg	100	Price of Power bank * Quantity 100 *100	Weight of Power bank * Quantity 0.5*100	RM 10000	50 Kg
Charger	RM 50	0.002K g	200	Price of Charger * Quantity 50 * 200	Weight of Charger * Quantity 0.002 * 200	RM 10000	0.4Kg
Phone Case	RM 10	0.001K g	100	Price of Phone Case * Quantity	Weight of Phone Case * Quantity	RM 1000	0.1Kg

				10 * 100	0.001 * 100		
Total Price of Accessories / Total Weight of Accessories						RM 608500	65.3 Kg
Shipping Fee	RM 5/Kg	Price of Shipping Fee * Total Weight of Accessories 5 * 65.3			RM 326.50		
Total Price	Total Price of Accessories + Shipping Fee			RM 608826.50			

Discount	Total Price * 0.02	RM 12176.53
Total Price After Discount	Total Price - discount	RM 596649.97
Instalment Rate for 12 months	Total Price After Discount * 0.05	RM 29832.50
Total Price After Instalment Rate	Total Price After Discount + Instalment for 12 months	RM 626482.47
Total Price Consumers Should Pay Every Month	Total Price After Instalment Rate /12	RM 52206.87

ALGORITHM

Totalprice = processor + ram + storage + camera + screen technology + battery + earphone + power bank + phone case + screen protector + shippingfee

Discount = totalprice * 0.10

Total price after discount = totalprice – discount

Change = Amount tendered - Total price after discount

Instalment amount if 12 months = Total price after discount * 0.04

Instalment amount if 24 months = Total price after discount * 0.05

Total should pay if instalment is 12 months = Instalment amount if 12 months + Total price after discount

Total should pay if instalment is 24 months = Instalment amount if 24 months + Total price after discount

Total should pay monthly if instalment is 12 months = Total should pay if instalment is 12 months / 12

Total should pay monthly if instalment is 24 months = Total should pay if instalment is 24 months / 24

PSEUDOCODE

START

method main():

Output “Enter your name.”

Input name

Output “Enter your IC.”

Input IC

Output “Enter your phone number.”

Input phone number

CALL line

CALL shop

CALL line

```

CALL processor
CALL ram
CALL storage
CALL camera
CALL screen
CALL battery
CALL earphone
CALL screenprotector
CALL powerbank
CALL phonecase
CALL shippingfee
CALL total
CALL paymentmethod

END
method void line()
    FOR (int i = 0; i < 80; i++)
        OUTPUT “ _ ”
RETURN
method void shop()
OUTPUT “          *****WELCOME DREAM MOBILE SHOP*****”
method double processor()
    Declare
        Totalprice=0
        String processor[] = { "Snapdragon 888", "Snapdragon 855", "Exynos
2100", "Kirin 9000 " }
        double[] priceprocessor = { 2000, 800, 800, 1200 }

    Calculate

    Totalprice += priceprocessor[]

    OUTPUT “We have these processor!”
    OUTPUT "1. "+processor[0]+" RM "+ priceprocessor[0]
    OUTPUT "2. "+processor[1]+" RM "+ priceprocessor[1]
    OUTPUT "3. "+processor[2]+" RM "+ priceprocessor[2]
    OUTPUT "4. "+processor[3]+" RM "+ priceprocessor[3]

Input processor
If processor =1

```

OUTPUT ""You choose "+ processor[0]+" and the price processor is RM
"+priceprocessor[0]"

Totalprice += priceprocessor[0]

If processor =2

OUTPUT ""You choose "+ processor[1]+" and the price processor is RM
"+priceprocessor[1]"

Totalprice += priceprocessor[1]

If processor =3

OUTPUT ""You choose "+ processor[2]+" and the price processor is RM
"+priceprocessor[2]"

Totalprice += priceprocessor[2]

If processor =4

OUTPUT ""You choose "+ processor[3]+" and the price processor is RM
"+priceprocessor[3]"

Totalprice += priceprocessor[3]

RETURN

method double ram()

Declare

Totalprice=0

String ram[] = { "4 GB", "6 GB", "8 GB" }

double[] priceram = { 200,400,500 }

Calculate

Totalprice += priceram[]

OUTPUT "We have these ram!"

OUTPUT "1. "+ram[0]+" RM "+ priceram [0]

OUTPUT "2. "+ ram [1]+" RM "+ priceram [1]

OUTPUT "3. "+ ram [2]+" RM "+ priceram [2]

Input ram

If ram =1

Output ""You choose "+ ram[0] +" and the price ram is RM "+priceram[0]"

Totalprice += priceram [0]

If ram =2

Output ""You choose "+ ram [1] +" and the price ram is RM "+priceram [1]"

Totalprice += priceram [1]

If ram =3

Output ""You choose "+ ram [2] +" and the price ram is RM "+priceram [2]"

Totalprice += priceram [2]

RETURN

method double storage()

Declare

Totalprice=0

String storage [] = { "32 GB", "64 GB", "128 GB", "256 GB" }

double[] pricestorage = { 300,400,600,800 }

Calculate

Totalprice += pricestorage []

OUTPUT "We have these storage!"

OUTPUT "1. "+ storage [0]+" RM "+ pricestorage [0]

OUTPUT "2. "+ storage [1]+" RM "+ pricestorage [1]

OUTPUT "3. "+ storage [2]+" RM "+ pricestorage [2]

OUTPUT "4. "+ storage [3]+" RM "+ pricestorage [3]

Input storage

If storage =1

Output ""You choose "+ storage [0] +" and the price storage is RM "+pricestorage [0]"

Totalprice += pricestorage [0]

If storage =2

Output ""You choose "+ storage [1] +" and the price storage is RM "+ pricestorage [1]"

Totalprice += pricestorage [1]

If storage =3

Output ""You choose "+ storage [2] +" and the price storage is RM "+ pricestorage [2]"

Totalprice += pricestorage [2]

If storage =4

Output ""You choose "+ storage [3] +" and the price storage is RM "+ pricestorage [3]"

Totalprice += pricestorage [3]

RETURN

method double camera()

Declare

Totalprice=0

```
String camera [] = {"16 MP","32 MP","64 MP"}  
double[] pricecamera = {100,200,300}
```

Calculate

```
Totalprice += pricecamera []
```

```
OUTPUT "We have these camera!"
```

```
OUTPUT "1. "+ camera [0]+" RM "+ pricecamera [0]
```

```
OUTPUT "2. "+ camera [1]+" RM "+ pricecamera [1]
```

```
OUTPUT "3. "+ camera [2]+" RM "+ pricecamera [2]
```

Input camera

If camera =1

```
Output ""You choose "+ camera [0] +" and the price camera is RM "+ pricecamera  
[0]"
```

```
Totalprice += pricecamera [0]
```

If storage =2

```
Output ""You choose "+ camera [1] +" and the price camera is RM "+ pricecamera  
[1]"
```

```
Totalprice += pricecamera [1]
```

If storage =3

```
Output ""You choose "+ camera [2] +" and the price camera is RM "+ pricecamera  
[2]"
```

```
Totalprice += pricecamera [2]
```

RETURN

```
method double screen()
```

```
Declare
```

```
Totalprice=0
```

```
String[]screen= {"AMOLED","IPS"};
```

```
double[]pricescreen= {1000,700};
```

Calculate

```
Totalprice += pricescreen []
```

```
OUTPUT "We have these camera!"
```

```
OUTPUT "1. "+ screen [0]+" RM "+ pricescreen [0]
```

```
OUTPUT "2. "+ screen [1]+" RM "+ pricescreen [1]
```

Input screen

If screen =1

```
Output ""You choose "+ screen [0] +" and the price screen is RM "+ pricescreen [0]"
```

```
Totalprice += pricescreen [0]
```

If screen =2

Output ""You choose "+ screen [1] +" and the price screen is RM "+ pricescreen [1]"

Totalprice += pricescreen [1]

RETURN

method double battery ()

Declare

Totalprice=0

String[]battery= {"4300 mAh","5000 mAh","6400 mAh"};

double[]pricebattery= {100,200,300};

Calculate

Totalprice += pricebattery []

OUTPUT "We have these camera!"

OUTPUT "1. "+ battery [0]+" RM "+ pricebattery [0]

OUTPUT "2. "+ battery [1]+" RM "+ pricebattery [1]

OUTPUT "3. "+ battery [2]+" RM "+ pricebattery [2]

Input battery

If battery =1

Output ""You choose "+ battery [0] +" and the price battery is RM "+ pricebattery [0]"

Totalprice += pricebattery [0]

If battery =2

Output ""You choose "+ battery [1] +" and the price battery is RM "+ pricebattery [1]"

Totalprice += pricebattery [1]

If battery =3

Output ""You choose "+ battery [2] +" and the price battery is RM "+ pricebattery [2]"

Totalprice += pricebattery [2]

RETURN

Public static double earphone()

Declare

Totalprice=0

Int priceearphone = 25

Output "Do you want to purchase earphone for RM 25? YES(Y) or No(N)"

Input earphone

If earphone = 'Y' or 'y'

Output "Thank you! You add on earphone completely!"

Totalprice += priceearphone

If earphone = 'N' or 'n'

Output "Alright thank you."

RETURN

Public static double screenprotector ()

 Declare

 Totalprice=0

 Int pricescreenprotector = 10

Output "Do you want to purchase screen protector for RM 10? YES(Y) or No(N)"

Input screenprotector

If screenprotector= 'Y' or 'y'

Output "Thank you! You add on screen protector completely!"

Totalprice += pricecreenprotector

If earphone = 'N' or 'n'

Output "Alright thank you."

RETURN

Public static double powerbank ()

 Declare

 Totalprice=0

 Int pricepowerbank = 50

Output "Do you want to purchase power bank for RM 50? YES(Y) or No(N)"

Input powerbank

If powerbank = 'Y' or 'y'

Output "Thank you! You add on power bank completely!"

Totalprice += pricepowerbank

If powerbank = 'N' or 'n'

Output "Alright thank you."

RETURN

Public static double phonecase ()

 Declare

 Totalprice=0

 Int pricephonecase = 10

Output "Do you want to purchase phone case for RM 10? YES(Y) or No(N)"

Input phonecase

```

If phonecase = 'Y' or 'y'
Output "Thank you! You add on phone case completely!"
Totalprice += pricephonecase
If phonecase = 'N' or 'n'
Output "Alright thank you."
RETURN

Public static double shippingfee ()
    Declare
        Totalprice=0
        Double shippingfee
        double shippingfees[] = {50,60}

    Output "\nWhat is the place you live and we can delivery to you.South(S) or
    North(N)"

    Input shippingfee
    If shippingfee = 'S' or 's'
        Output "Thank you! We will delivery to you!"
        Totalprice += shippingfees[0]
        If shippingfee = 'N' or 'n'
            Output "Thank you! We will delivery to you!"
            Totalprice += shippingfees[1]
        RETURN

    Public static double total ()
        Declare
            Double totalprices= Totalprice
        Calculate
            Double discount = totalprices * 0.10
            Double price = totalprices – discount
            Output "The total price is : RM "
            Output "Discount : RM "
            Output "Total price after discount is : RM "

        RETURN

    Public static double paymentmethod ()
        Declare
            Price = totalprices
            Int month
            String PT

```


Double tendered

Output "Please choose your payment types"

Output "Please Enter [C] as Cash or [I] as Instalment"

Input PT

If PT = 'C' or 'c'

Output "The total amount you should pay after discount is : RM"

Output "Please enter your amount tendered : RM"

Input tendered

Output "Thank you!!!"

Output "This is your receipt"

line()

Output "*****RECETPT*****"

Output "*****DREAM MOBILE SHOP*****"

Output "*****CONTACT NUMBER: 016-3672588*****"

Output "Consumer Detail"

Output "Name"

Output "IC"

Output "Phone number"

Output "Total price"

Output "Discount"

Output "Total price after discount"

Output "Amount tendered"

Output "Change"

Output "*****THANK YOU!!! PLEASE COME AGAIN*****"

If payment = 'I' or 'i'

Output "Instalment for 12 months' duration = 4% interest rate"

Output "Instalment for 24 months' duration = 5% interest rate"

Output "Please enter [12] for 12 months' duration, [24] for 24 months' duration"

Input month

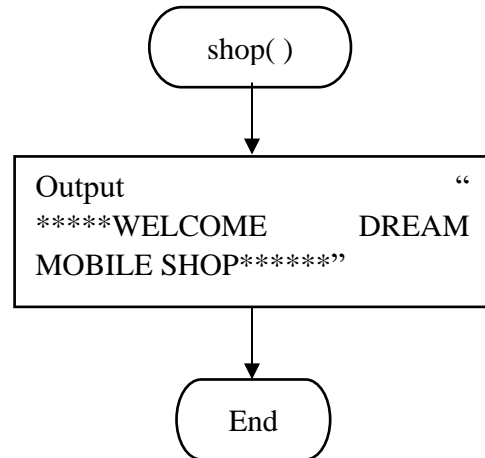
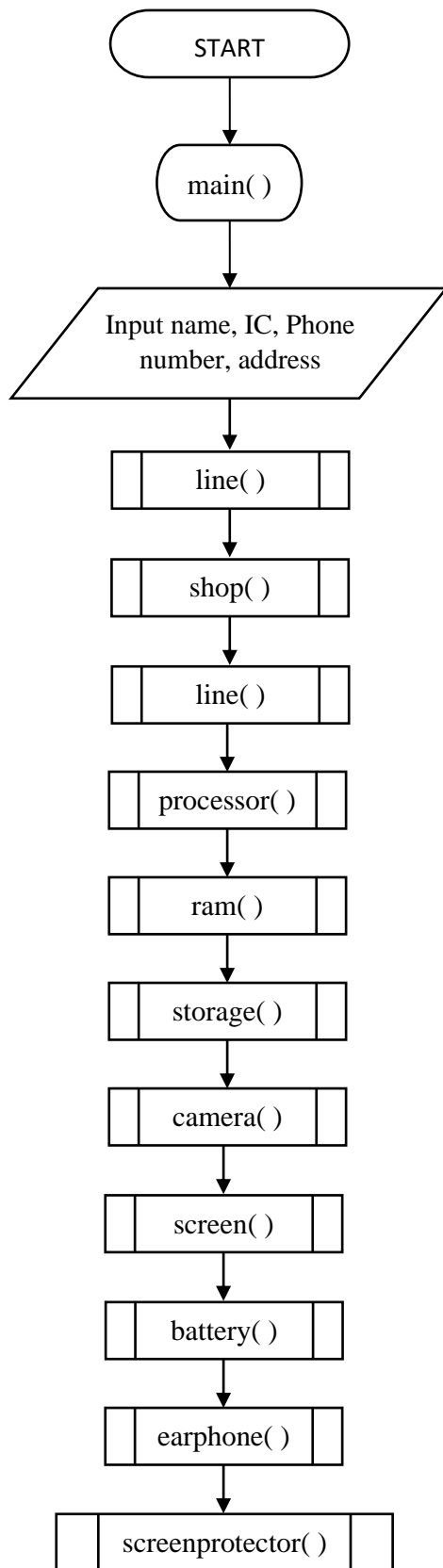
If month =12

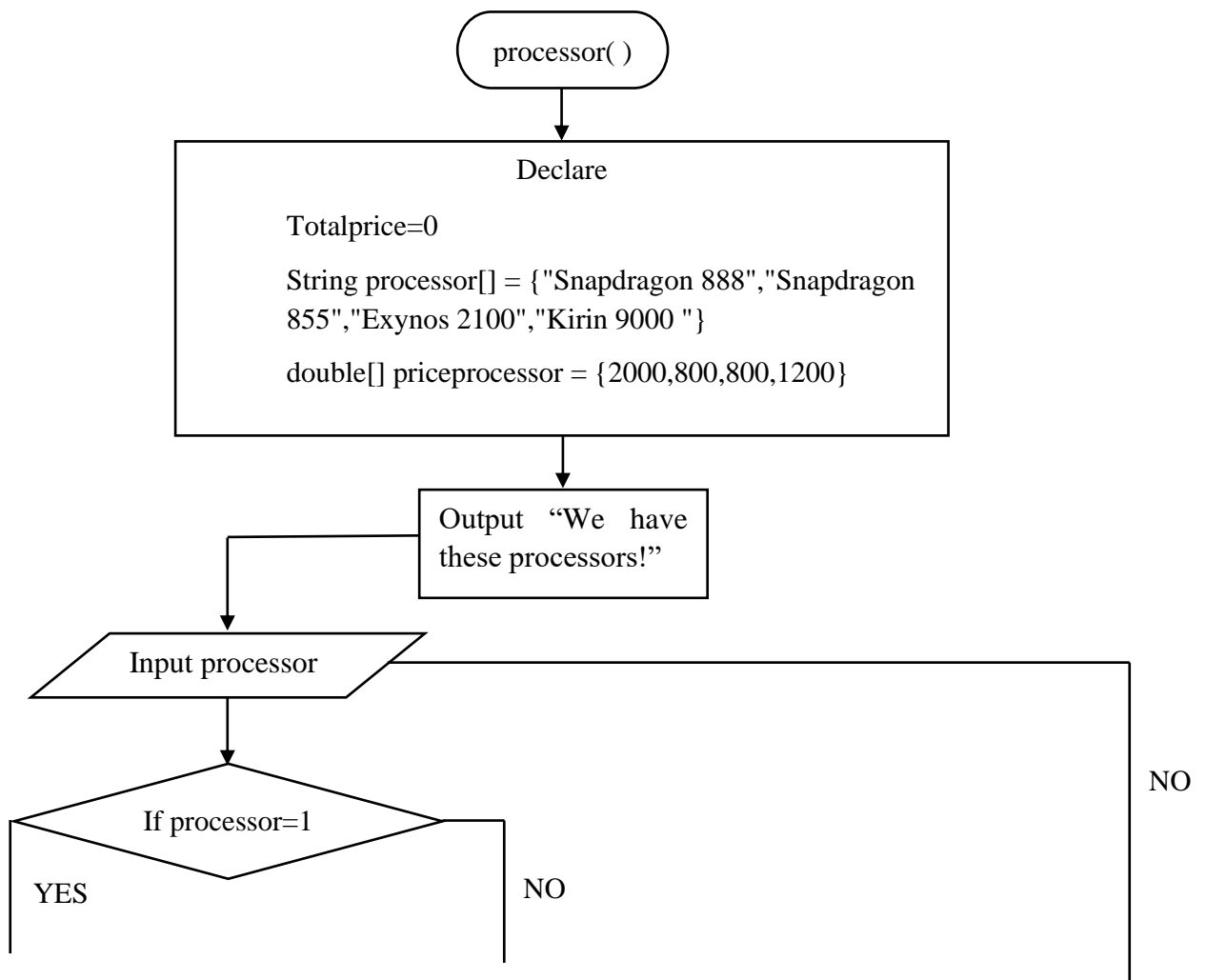
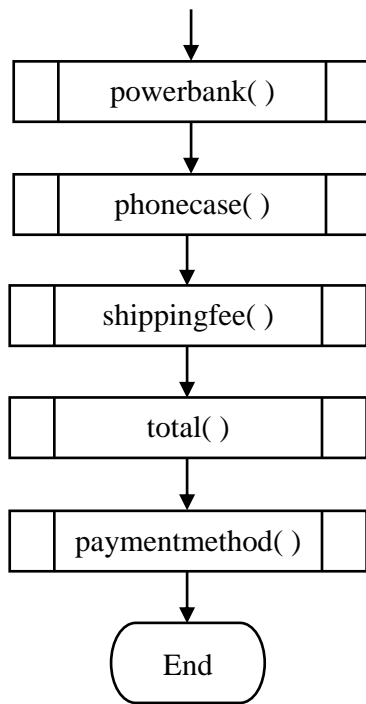
Output "You choose 12 months' duration."

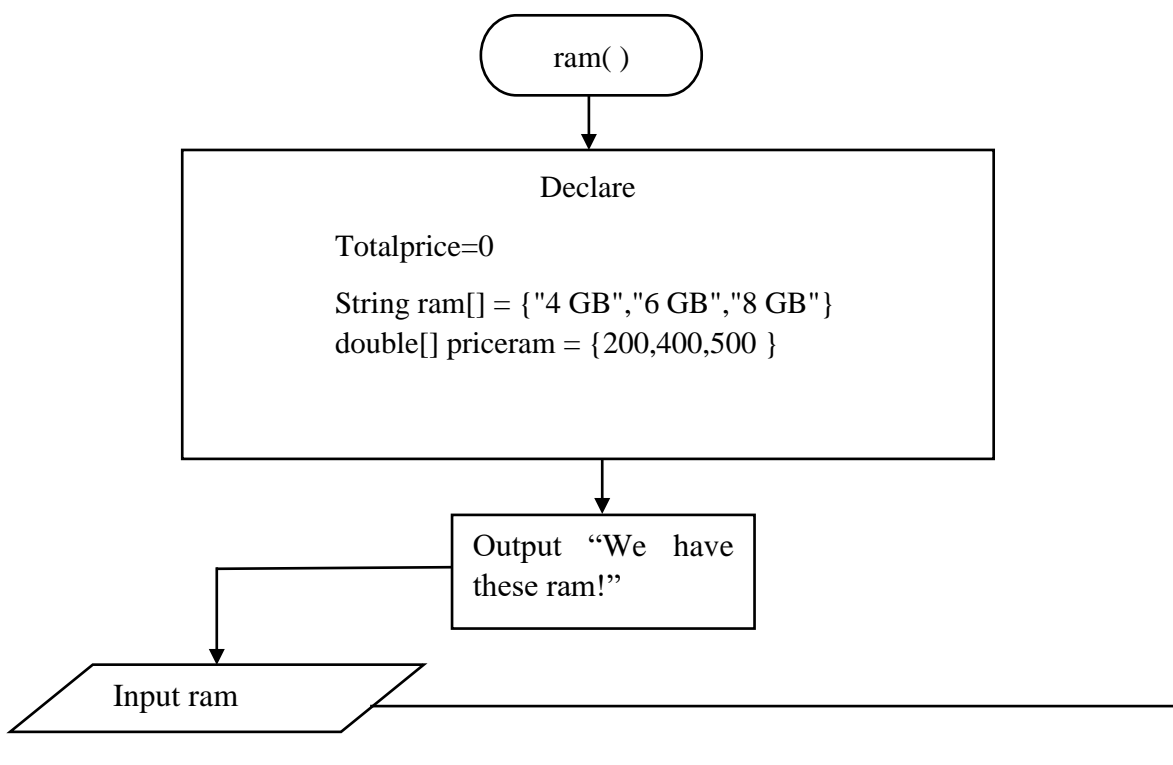
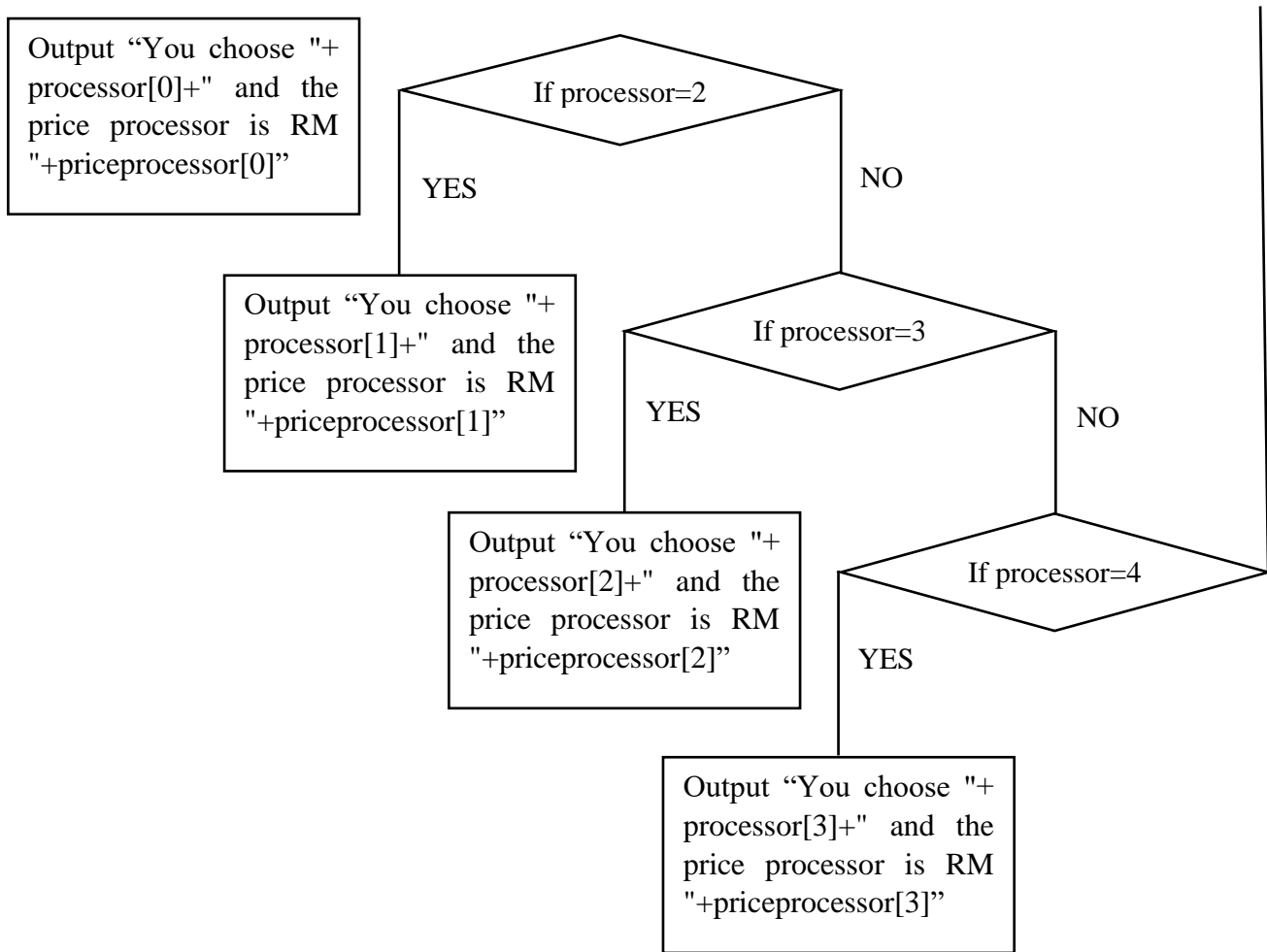
$\text{Instalment} = \text{price} * 0.04$
 $\text{Instalmentpay} = \text{price} + \text{instalment}$
 $\text{Instalmentpaymonth} = \text{instalmentpay} / 12$
 Output "Total instalment amount"
 Output "Total balance should pay"
 Output "Total should pay monthly"
 If month =24
 Output "You choose 24 months' duration."
 $\text{Instalment} = \text{price} * 0.05$
 $\text{Instalmentpay} = \text{price} + \text{instalment}$
 $\text{Instalmentpaymonth} = \text{instalmentpay} / 24$
 Output "Total instalment amount"
 Output "Total balance should pay"
 Output "Total should pay monthly"
 Output "Thank you!!!"
 Output "This is your receipt"
 Output "*****RECEIPT*****"
 Output "*****DUDUDU ACCESSORIES SHOP*****"
 Output "*****CONTACT NUMBER: 016-3672588*****"
 Output "Consumer Detail"
 Output "Name"
 Output "IC"
 Output "Phone number"
 Output "Total price"
 Output "Discount"
 Output "Total price after discount"
 Output "Total instalment amount"
 Output "Total balance should pay"
 Output "Total should pay monthly"
 Output "*****THANK YOU!!! PLEASE COME AGAIN*****"

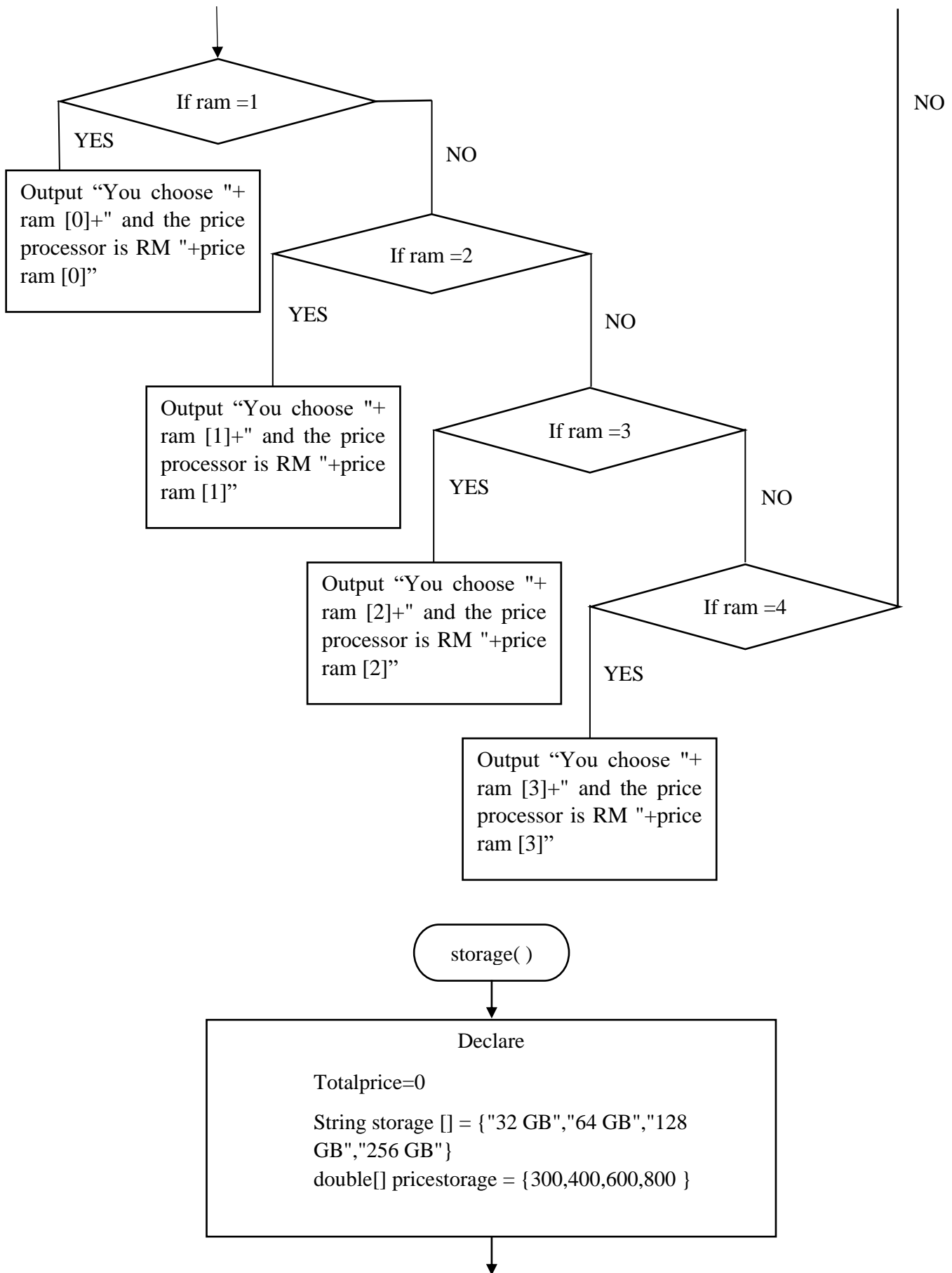
RETURN

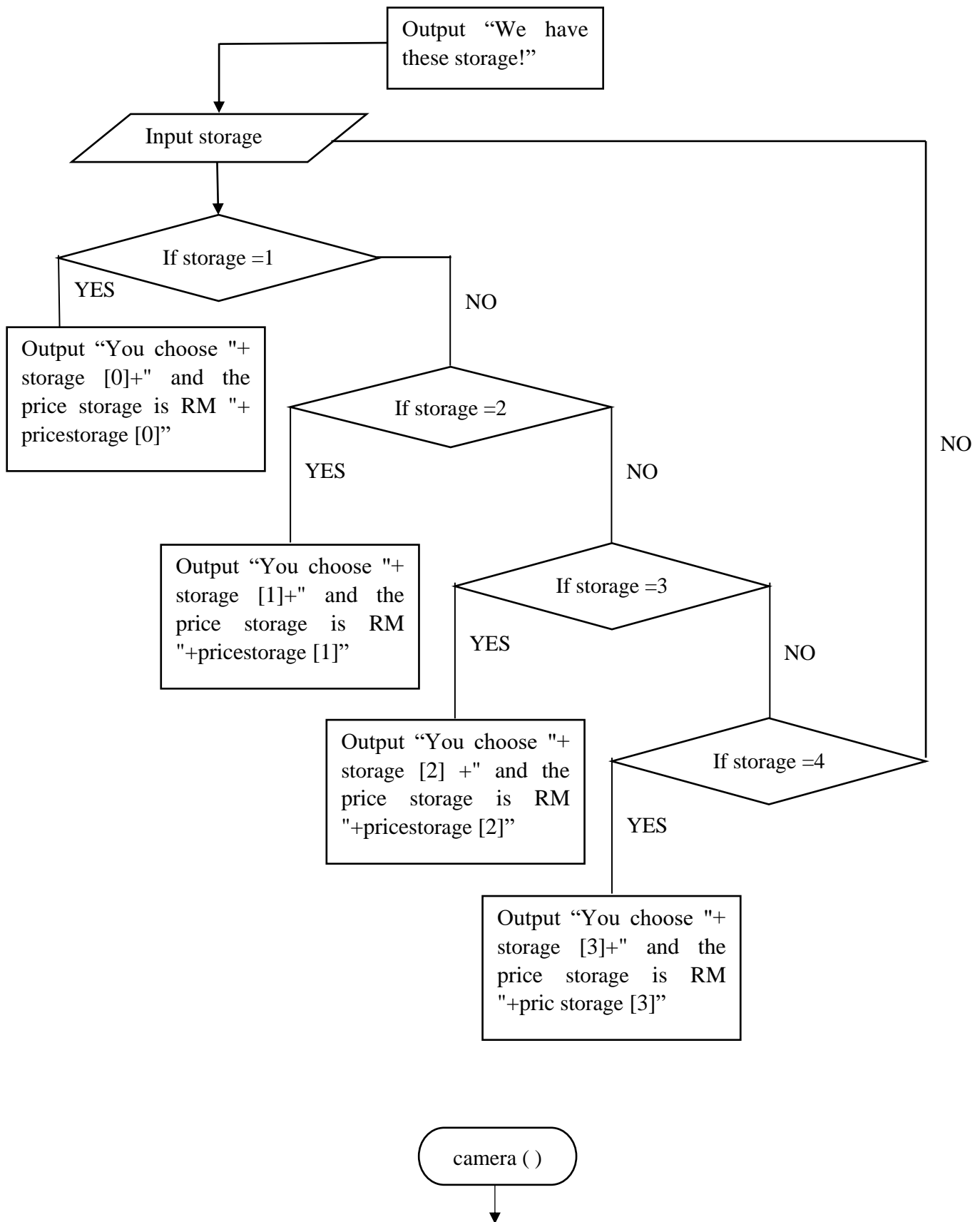
FLOW CHART

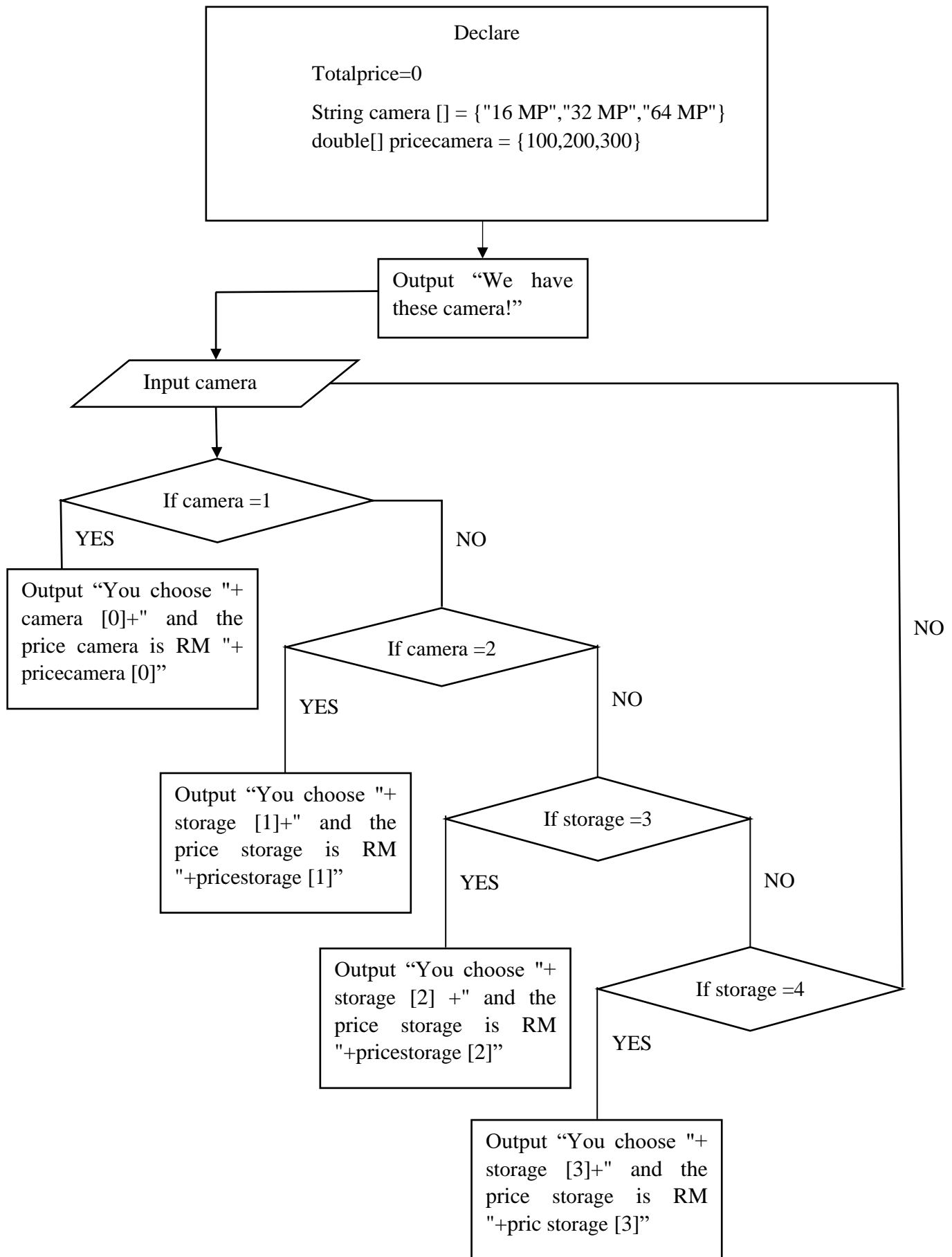


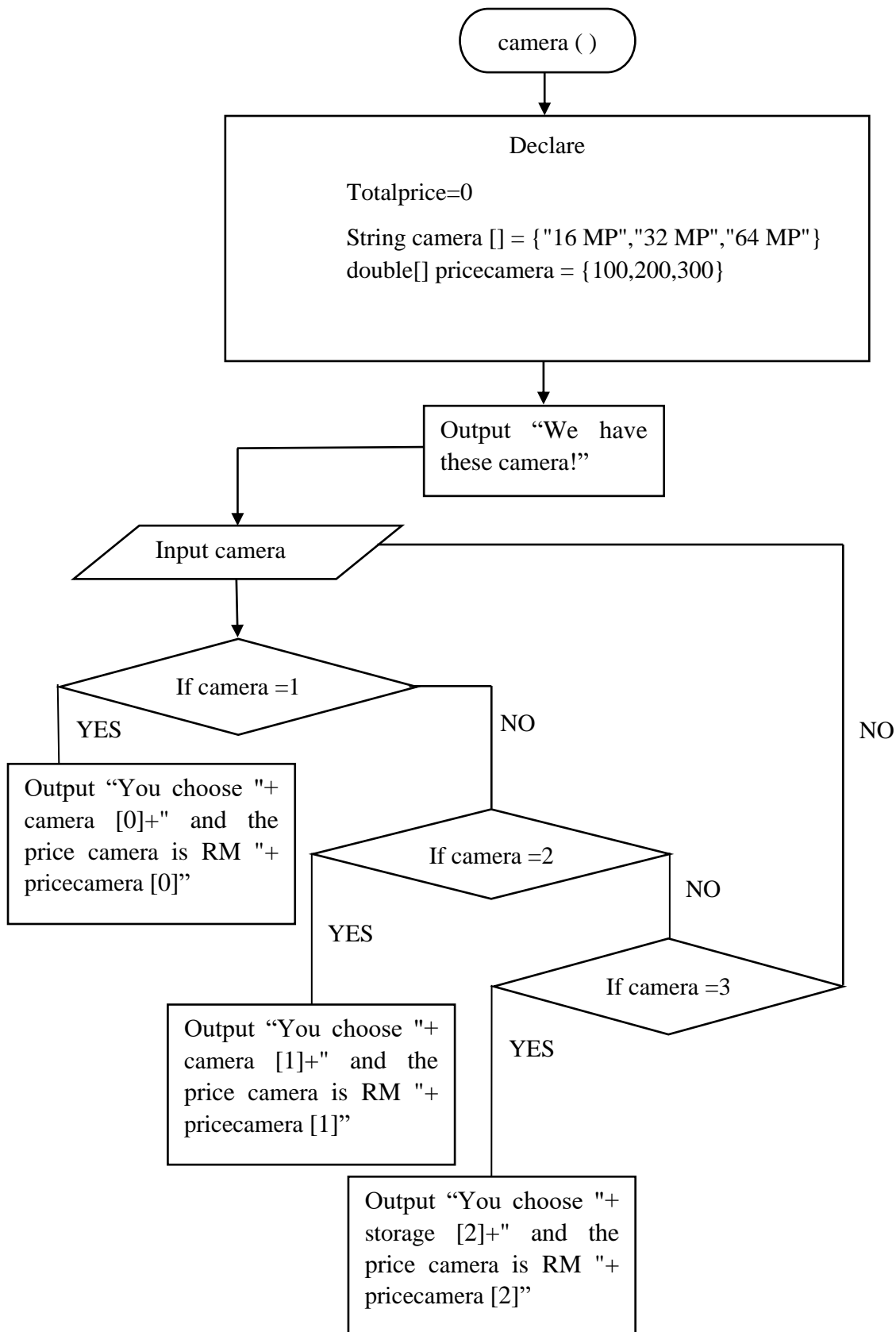


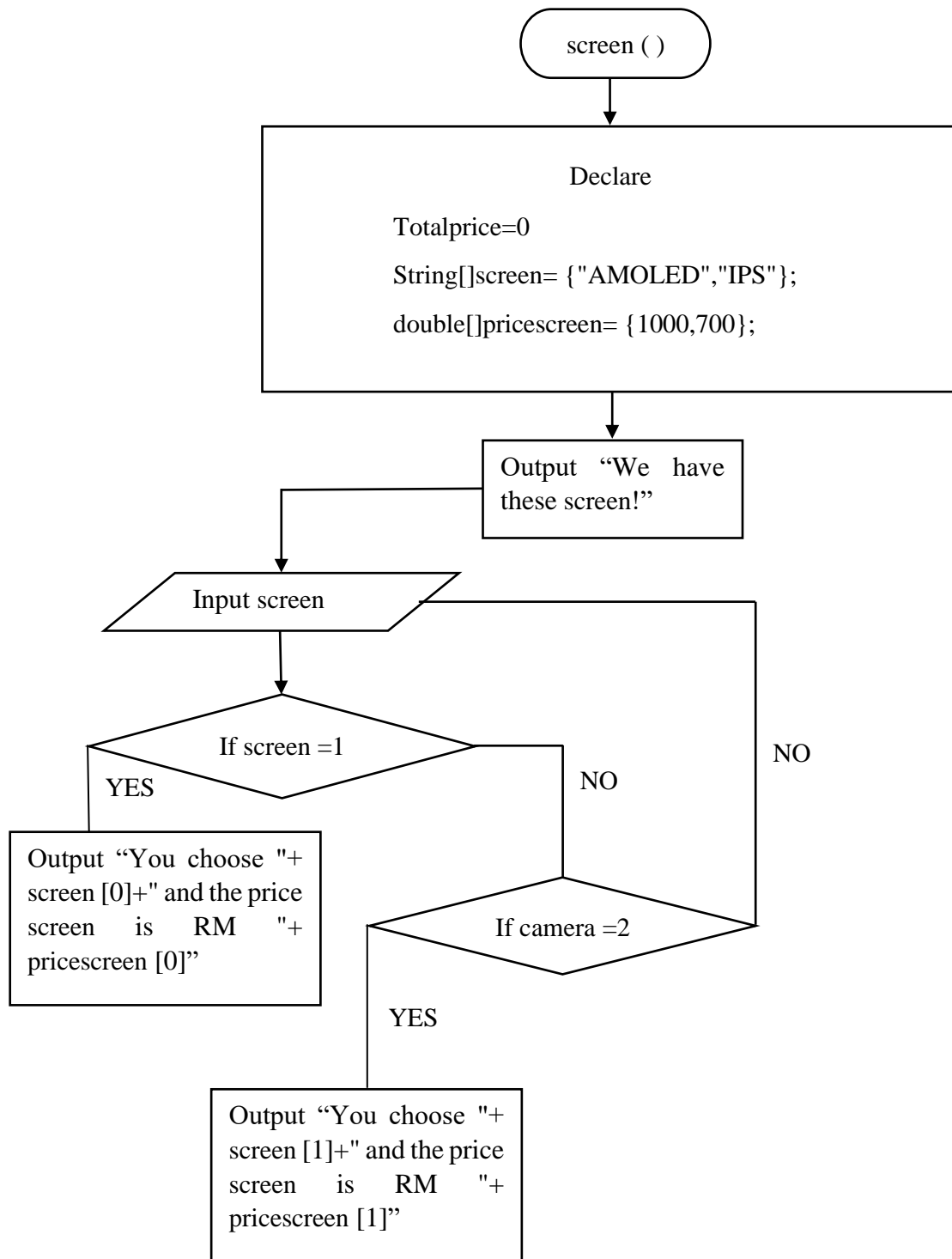


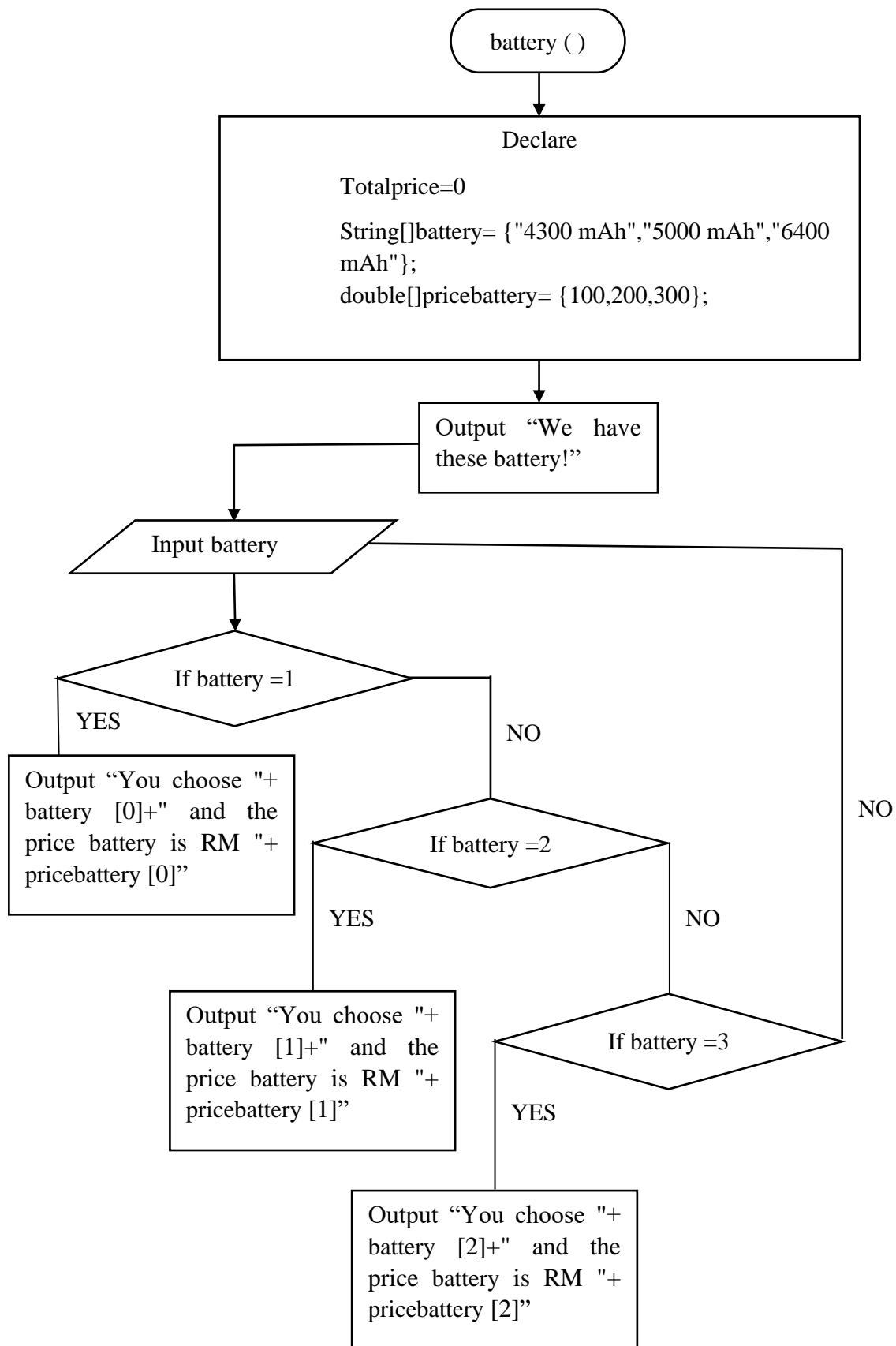


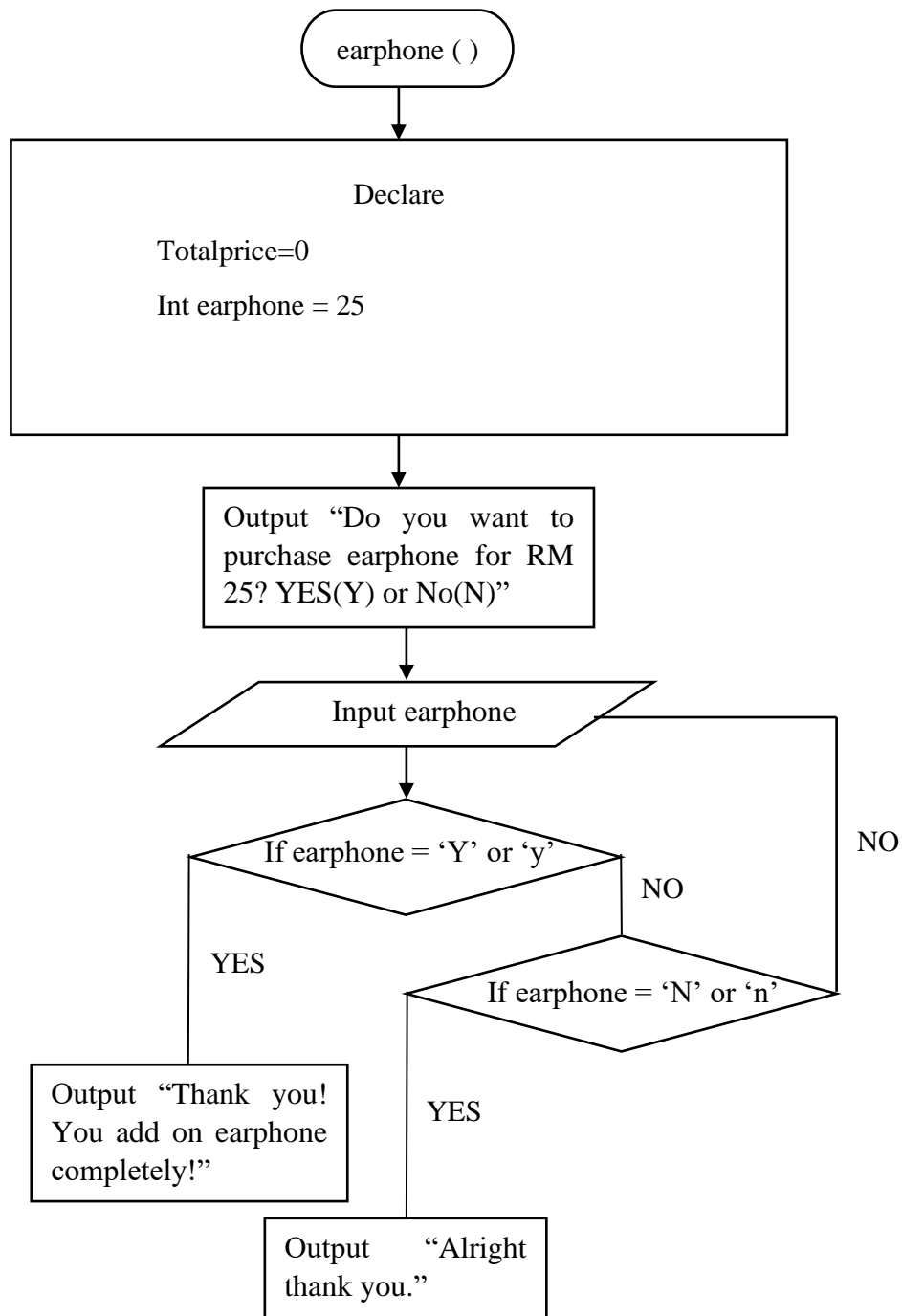


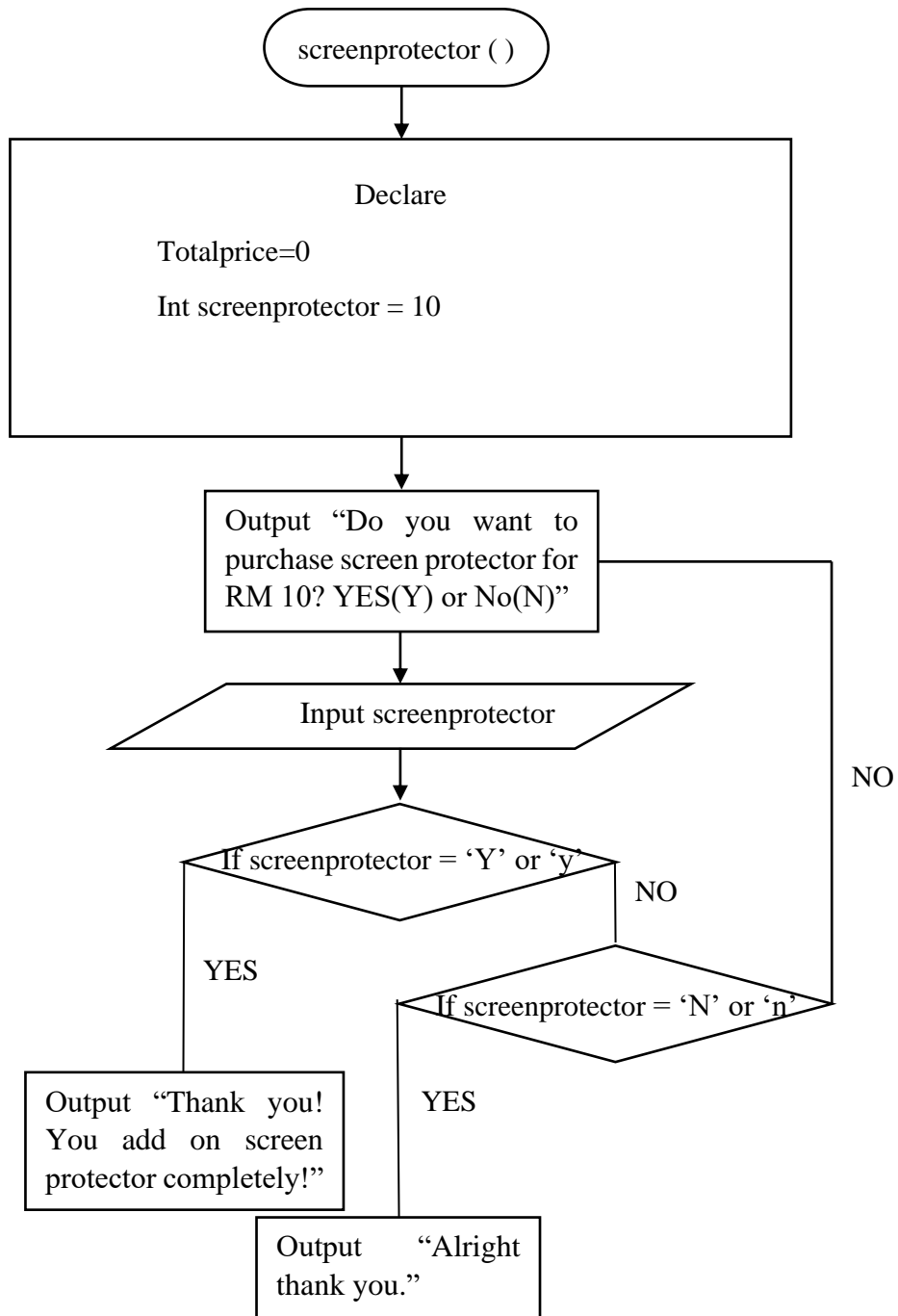


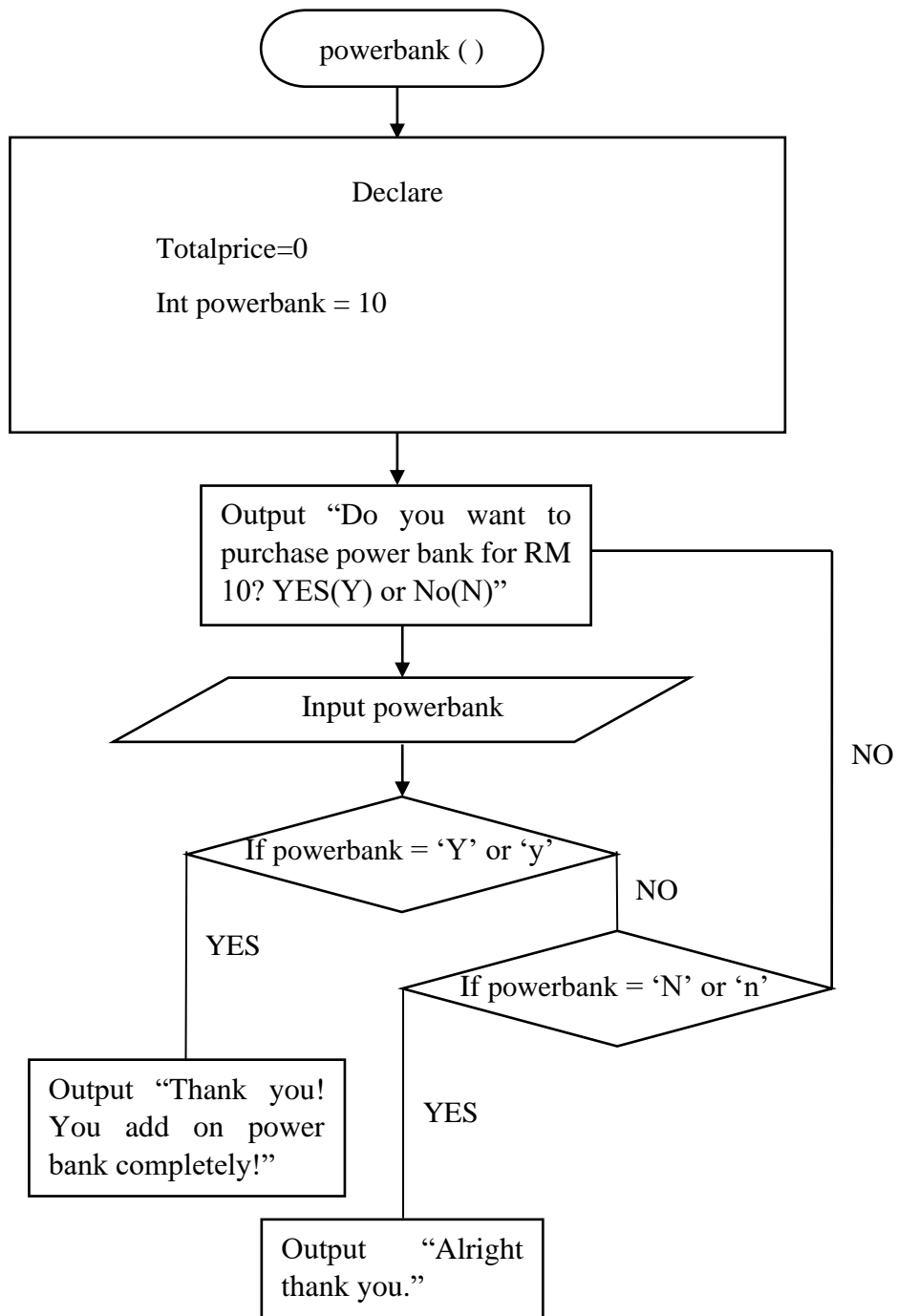


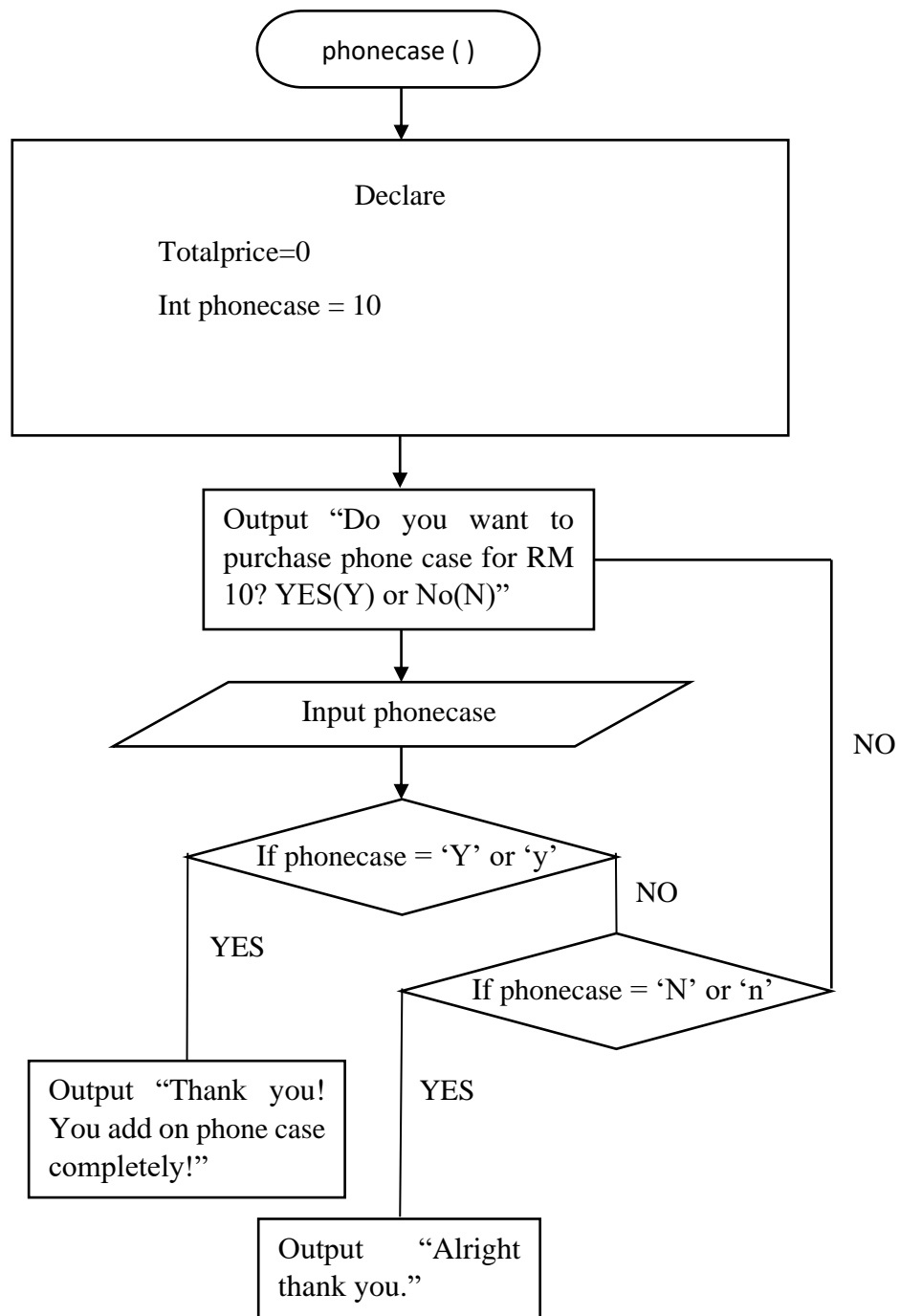


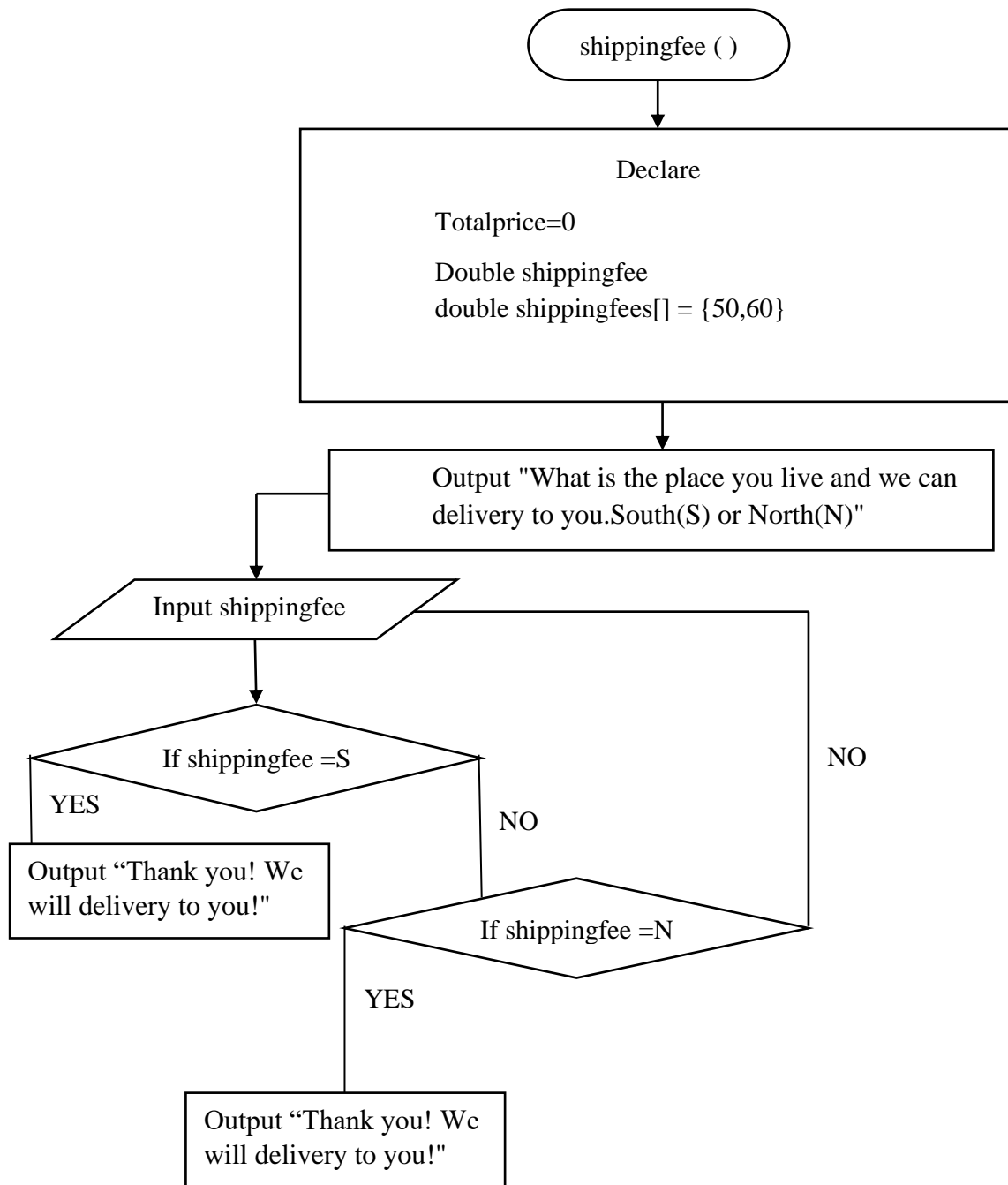


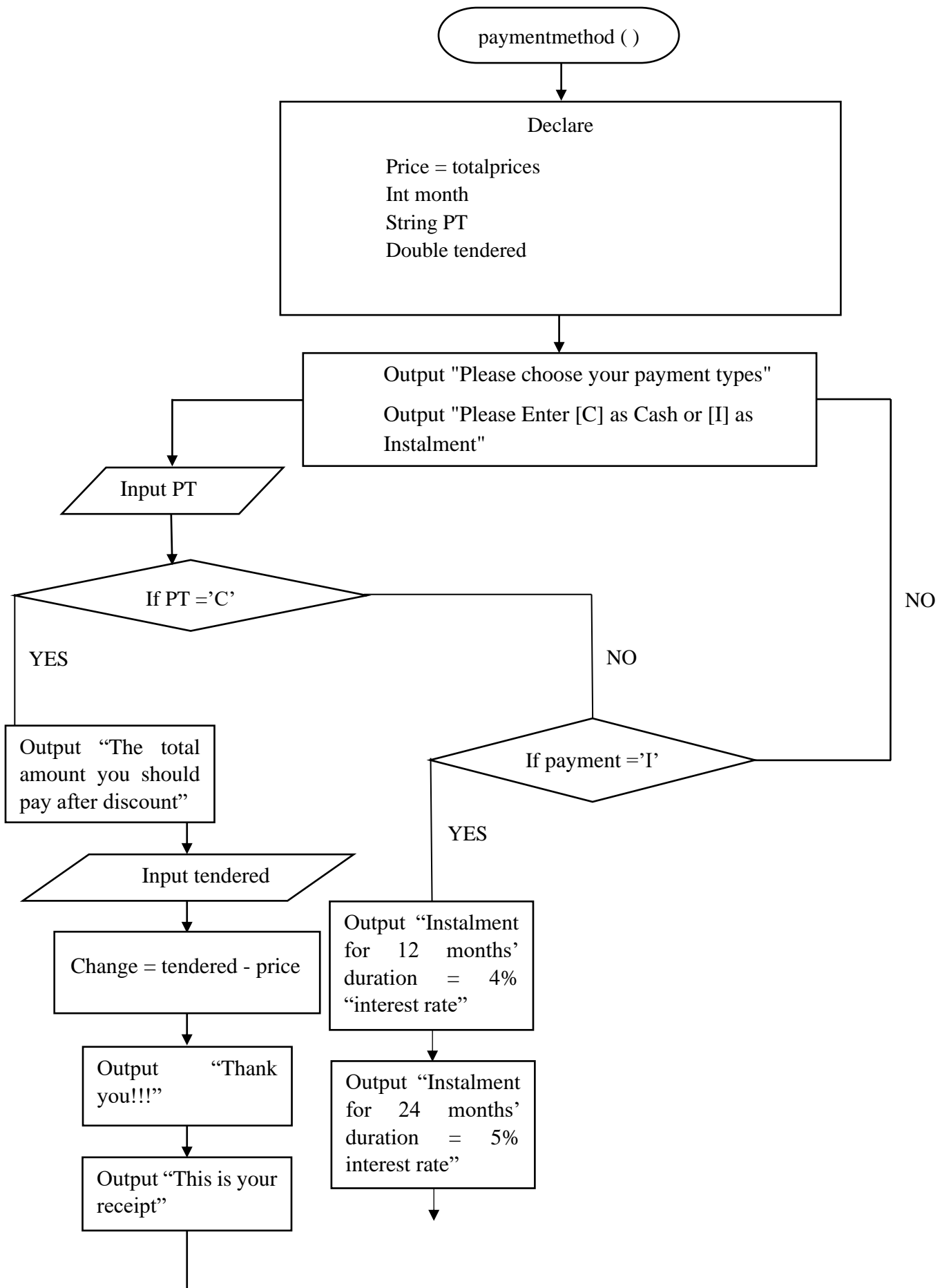


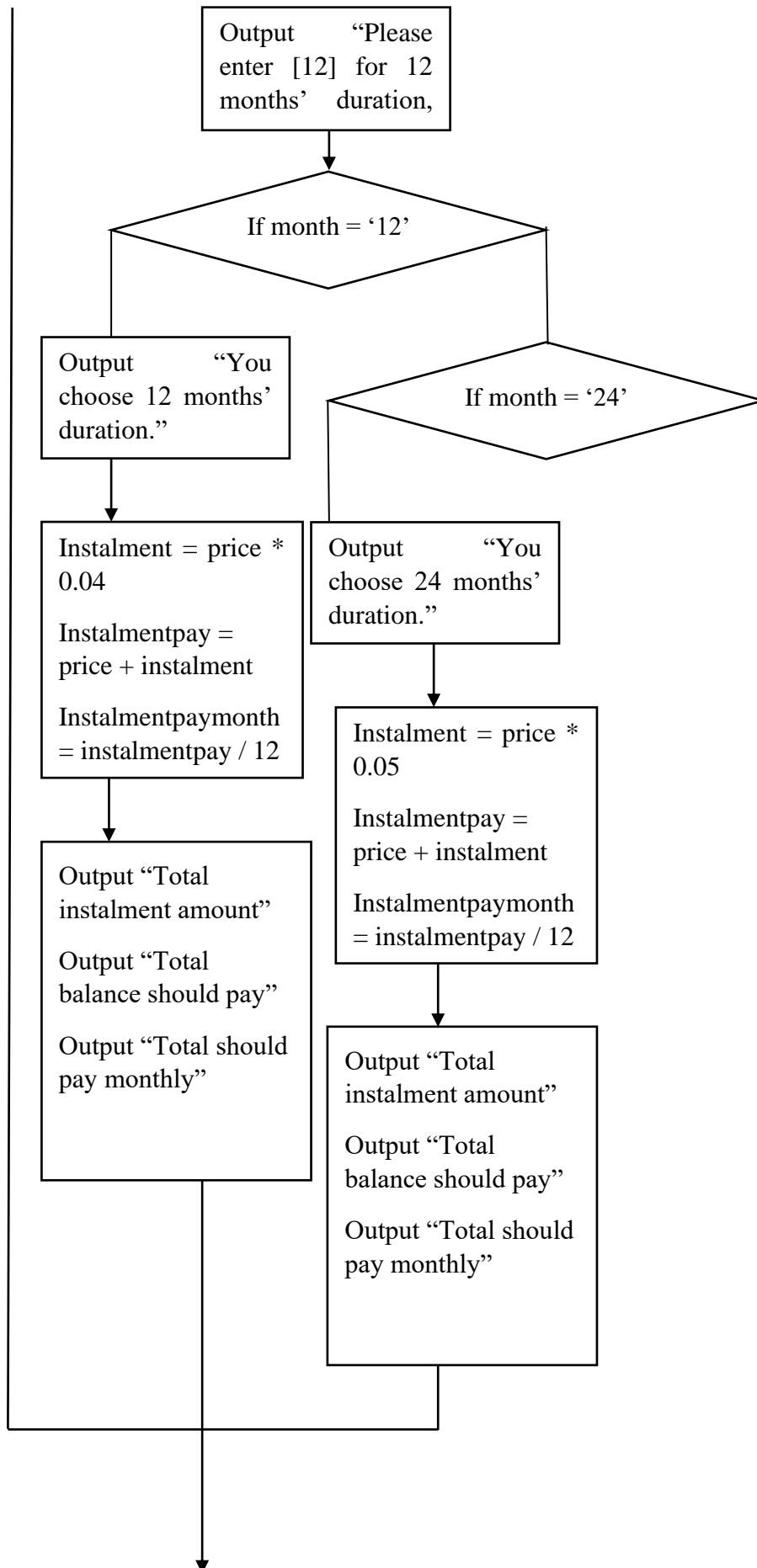












Output “*****RECEIPT*****”

Output “*****DREAM MOBILE SHOP*****”

Output “*****CONTACT NUMBER: 016-3672588*****”

Output “Consumer Detail”

Output “Name”

Output “IC”

Output “Phone number”

Output “*****RECEIPT*****”

Output “*****DREAM MOBILE SHOP*****”

Output “*****CONTACT NUMBER: 016-3672588*****”

Output “Consumer Detail”

Output “Name”

Output “IC”

Output “Phone number”

3.0 LAPTOP

UNDERSTAND THE PROBLEM

A laptop company made an agreement with Company A to sell their laptop to Company A. Company A decided to change all their old laptops in the company because all of them have been used for at most 5 years. This is because the laptops started to have slow performance and were not able to run multiple tabs to complete their everyday task which caused many projects of the company to not finish in time. Hence, the laptop company plan to trade in their old laptops and deduct the cost of their new laptops based on the value of old laptops from Company A. They are facing difficulty in calculating the depreciation of their old laptop and the amount of money they will receive from Company A after knowing the value of the old laptops. The laptop company requested us to create a program to calculate total depreciation of

the old laptops and the amount of money they will received. The laptop company also allow Company A to pay in installment for 5 years with an interest of 5% each year.

IDENTIFY THE PROBLEM

Depreciation is the process of allocating the expenses of tangible and intangible assets over time and use. To expense their assets, both public and private companies employ depreciation techniques that follow generally recognized accounting rules. Before determining an asset's depreciation, it's necessary to determine the asset's total cost, the length of time it'll be in use, and the asset's residual value, the amount it may be sold or transferred for after its usage period has ended. The residual value is the amount for which management believes the asset can be sold or transferred after it has been decommissioned. For instance, the maximum depreciation that can be expensed during the asset's life is \$8,800 if it costs \$10,000 and has an estimated residual value of \$1,200. The asset is never depreciated to the point of being worthless.

ALTERNATIVE WAYS

1. A program created based on declining balance method
2. A program created based on straight-line method
3. A program created based on units of production method
4. A program created based on sum of the years' digits method

BEST WAY

A program will be created to record the usage years of the laptop, the depreciation percentage, the purchase price of the old laptops, and the price of the new laptops. The program will arrange all the laptops of the Company A from the oldest to the latest. At the end of the coding, we will be able to know the residual value after minus the depreciation value and the money they will receive each month together with the interest. The coding will be created based on one of the methods in calculating depreciation value which is the declining balance method. Furthermore, the system will also calculate the cashback following the policy from Laptop Company provide to Company A if they are able to fulfill the requirement for cashback.

INSTRUCTIONS FOR SELECTED SOLUTION

1. The old laptops in the company will be categorized in groups according to their useful life of assets and the depreciation percentage.

2. After arranging all the laptops in Company A, we discover there are five types of laptop so they categorized according to their brand which is Asus, Apple, Acer, HP and Dell.
3. In the system, user will input the initial cost of laptop, depreciation percentage, and the usage life of laptop and the amount of laptop
4. The system will calculate the salvage value of the laptop from each group and then total them up.
5. The price of the new laptop we sold to Company A is RM 6000 and we sold 200 of the laptops to their company
6. After all the information has been input, the coding will show the instalment policy of Laptop Company. Company A will pay 20% deposit to fulfill the requirement of installment the coding will calculate the money owed by Company A after deducting the salvage value and the deposit in section 1. They are required to input the instalment period as well
7. In section 2, the coding will loop and show the instalment Company A need to pay each year with the interest and also the balance remain after they pay
8. In the cashback section will show the cashback policy and calculate the cashback they will get according to the rules of cashback.

EVALUATE SOLUTION

A business recognizes an equal amount of depreciation expenditure for each year an asset is in service under straight line depreciation. The reducing balance technique, also known as the declining balance method, twofold declining balance method, or accelerated method, accelerates depreciation in the early years of an asset's life. This is useful if the company needs a higher immediate tax benefit, but it limits future depreciation tax savings. The asset is depreciated at a higher percentage rate under the declining balance approach than it would be under straight line depreciation.

CALCULATION TABLE

Groups	Details	Formula
--------	---------	---------

Group A	<p>Useful life: x years</p> <p>Depreciation percentage (%): y</p> <p>Initial purchase price (RM): z</p> <p>Number of laptops in group A: 50</p>	<p>Before Depreciation = $z \times 50$</p> <p>After depreciation (a) = $(100\% - y) \times z \times 50$</p>
Group B	<p>Useful life: x years</p> <p>Depreciation percentage (%): Y</p> <p>Initial purchase price (RM): z</p> <p>Number of laptops in group B: 45</p>	<p>Before Depreciation = $z \times 45$</p> <p>After depreciation (b) = $(100\% - y) \times z \times 45$</p>
Group C	<p>Useful life: x years</p> <p>Depreciation percentage (%): Y</p> <p>Initial purchase price (RM): z</p> <p>Number of laptops in group C: 40</p>	<p>Before Depreciation = $z \times 40$</p> <p>After depreciation (c) = $(100\% - y) \times z \times 40$</p>
Group D	<p>Useful life: x years</p> <p>Depreciation percentage (%): Y</p> <p>Initial purchase price (RM): z</p> <p>Number of laptops in group C: 35</p>	<p>Before Depreciation = $z \times 35$</p> <p>After depreciation (d) = $(100\% - y) \times z \times 35$</p>
Group E	<p>Useful life: x years</p> <p>Depreciation percentage (%): Y</p> <p>Initial purchase price (RM): z</p> <p>Number of laptops in group C: 30</p>	<p>Before Depreciation = $z \times 30$</p> <p>After depreciation (e) = $(100\% - y) \times z \times 30$</p>
Total salvage value	<p>Group A: a</p> <p>Group B: b</p> <p>Group C: c</p> <p>Group D: d</p> <p>Group E: e</p>	<p>Total salvage value = $a + b + c + d + e$</p>

New Laptop Information	Amount Price	Total price = Amount \times Price
Instalment	Deposit Account receivable Instalment Instalment period (years): w Interest	Deposit = 20% \times Total price Account receivable = Total price - total salvage value – deposit Instalment = Account receivable \div w Interest = 5% \times Instalment
Cashback	Cashback (%) = q Cashback (RM)	Cashback (RM) = q \times Account Receivable

PSEUDOCODE

This program calculates the depreciation of old laptop and cash needed to trade in the new laptop

Start

1. Initialize double salvage_value, double salvage_values, double salvage_valueAsus, double salvage_valueApple, double salvage_valueAcer, double salvage_valueHp, double salvage_valueDell and double totalprice to 0. Initialize String laptops to “ASUS”, “APPLE”, “ACER”, “HP”, “DELL”.
2. Call method to main method
Welcome()
Asus(Laptops)
DepreciationAsus(salvage_value)
Apple(laptops)
DepreciationApple(salvage_value)
Acer(laptops)
DepreciationAcer(salvage_value)
Hp(laptops)
DepreciationHp(salvage_value)
Dell(laptops)
DepreciationDell(salvage_value)
Salvage(value)
sv(salvage_valueAsus, salvage_valueApple, salvage_valueAcer, salvage_valueHp, salvage_valueDell, double salvage_values)
Newlaptop()

- ```

newLaptop(totalprice)
Instalrules()
is(totalprice,salvage_values)
CashRules()
cashback(totalprice)
Thankyou()

```
3. Method Welcome(), Asus(laptops), Apple(laptops), Acer(laptops), Hp(laptops), Dell(laptops), Salvage(value), Newlaptop(), Instalrules(), CashRules() used to print user information
  4. Declare variables int amount, double purchase\_price, double total\_price, double year, double depreciation, double value and input the amount into the variables using scanner in method  

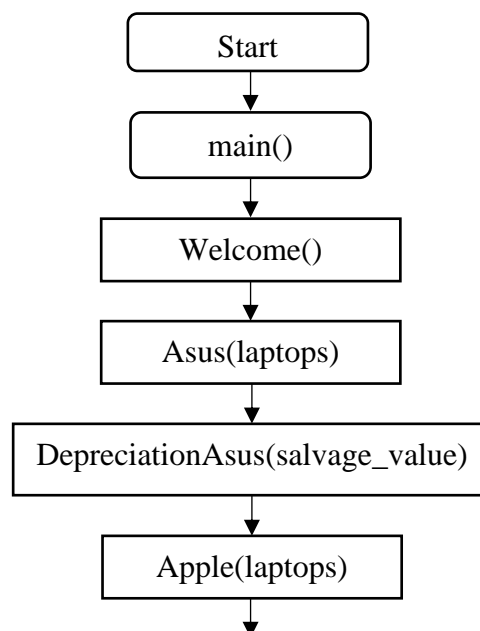
```

DepreciationAsus(salvage_value)
DepreciationApple(salvage_value)
DepreciationAcer(salvage_value)
DepreciationHp(salvage_value)
DepreciationDell(salvage_value)

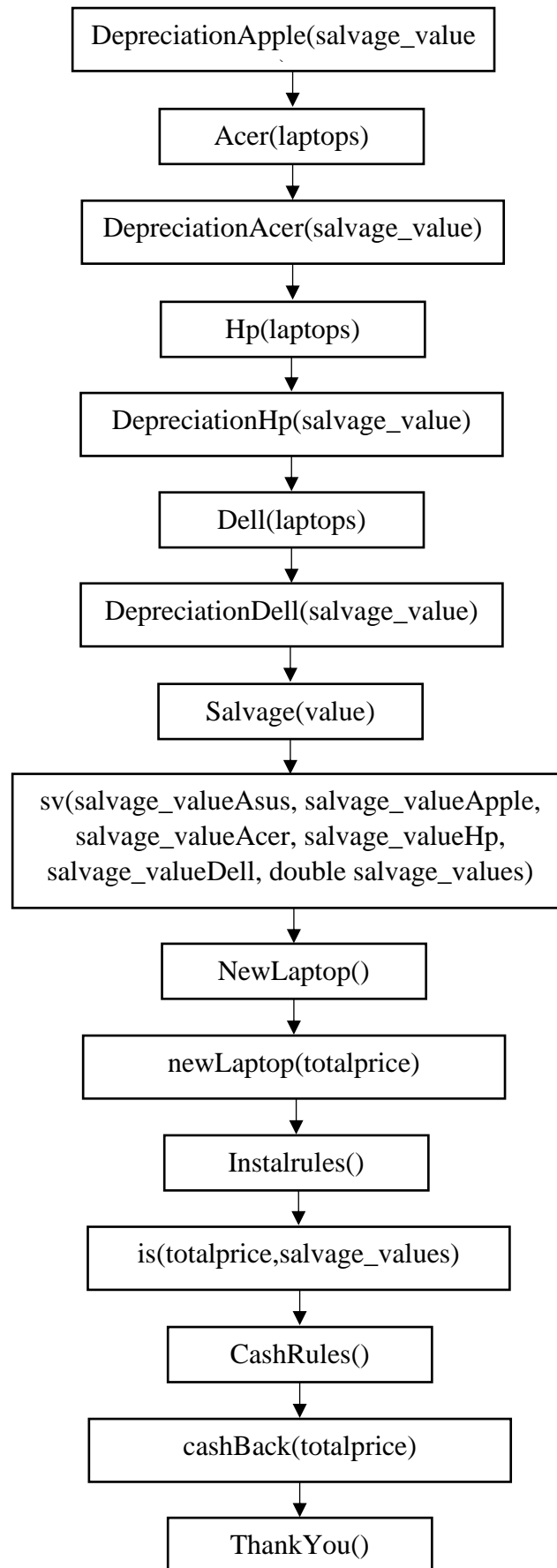
```
  5. For loop will calculate salvage\_value of all the depreciation method and return it to the main method.
  6. Method sv will calculate the t\_salvage\_value and return it to main method
  7. User input value for variable newlaptop and pricelaptop. Return totalprice
  8. Declare double deposit, double receivable, int instalperiod, double instalment and input the amount into variables using scanner in method is.
  9. Declare int duration, int cashback, double penalty, and initialize double money to 0.
  10. User input the duration and selection if else will use to determine the value of cashback and penalty.
  11. The method cashBack used to save this method and return value of money

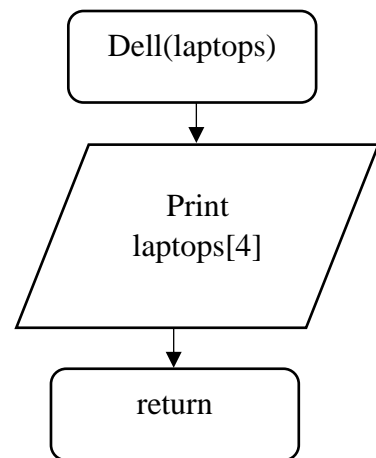
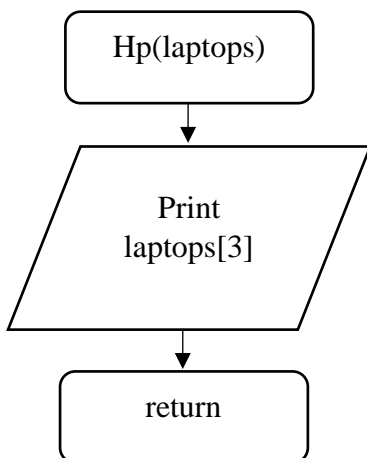
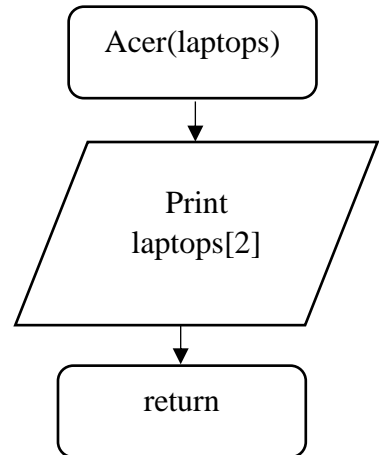
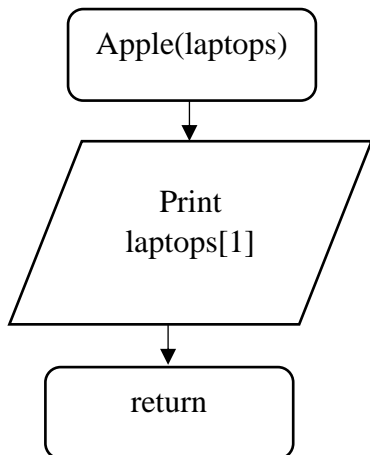
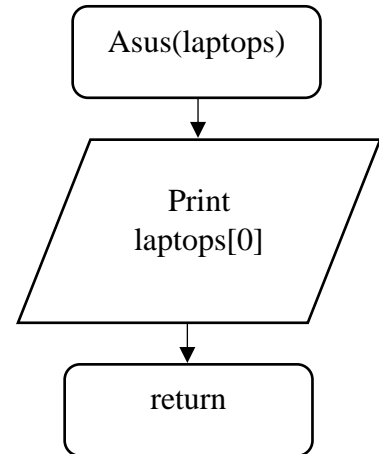
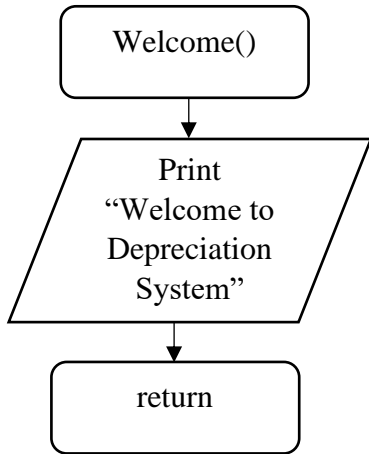
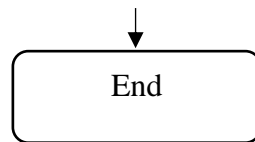
End

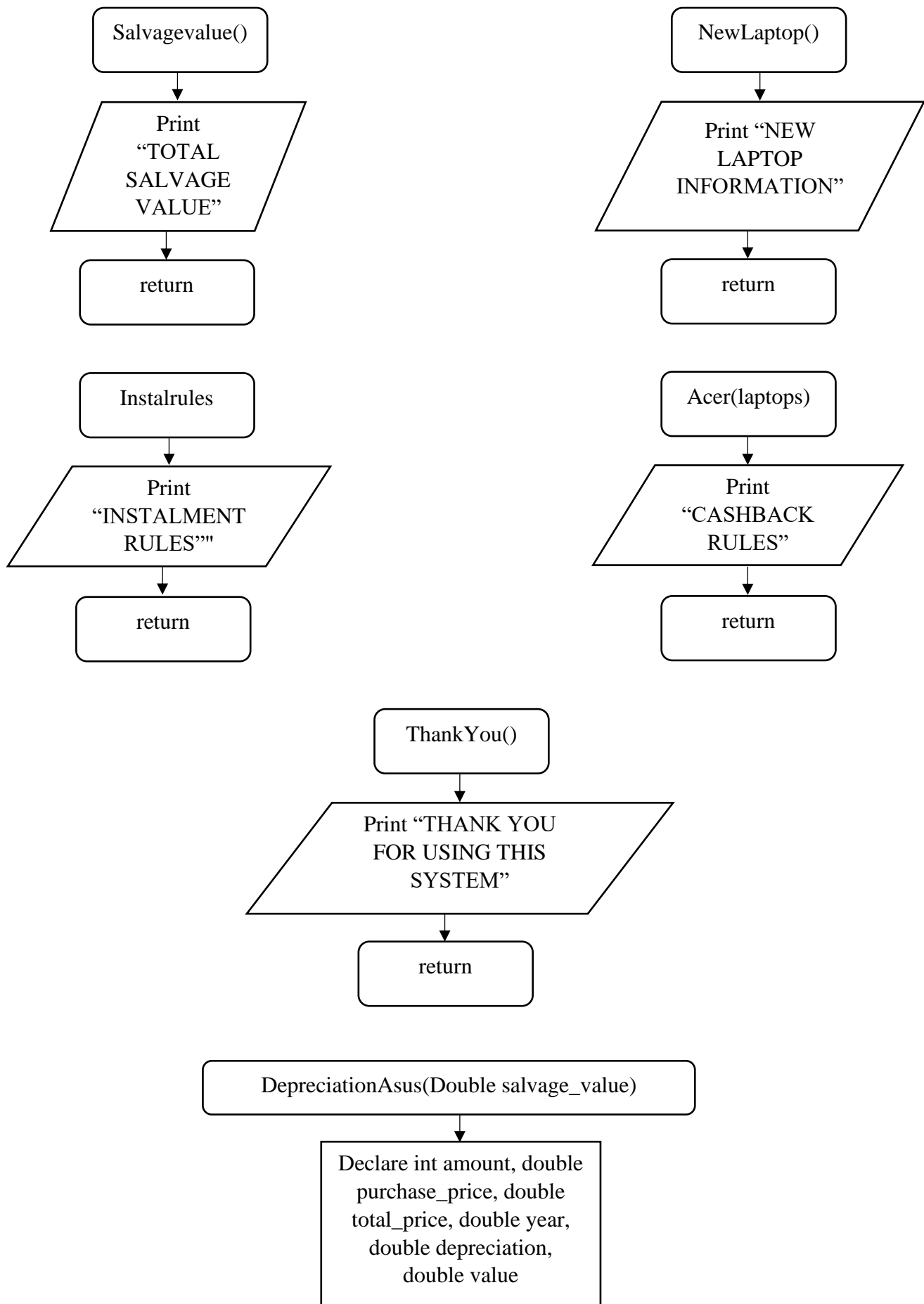
## FLOW CHART

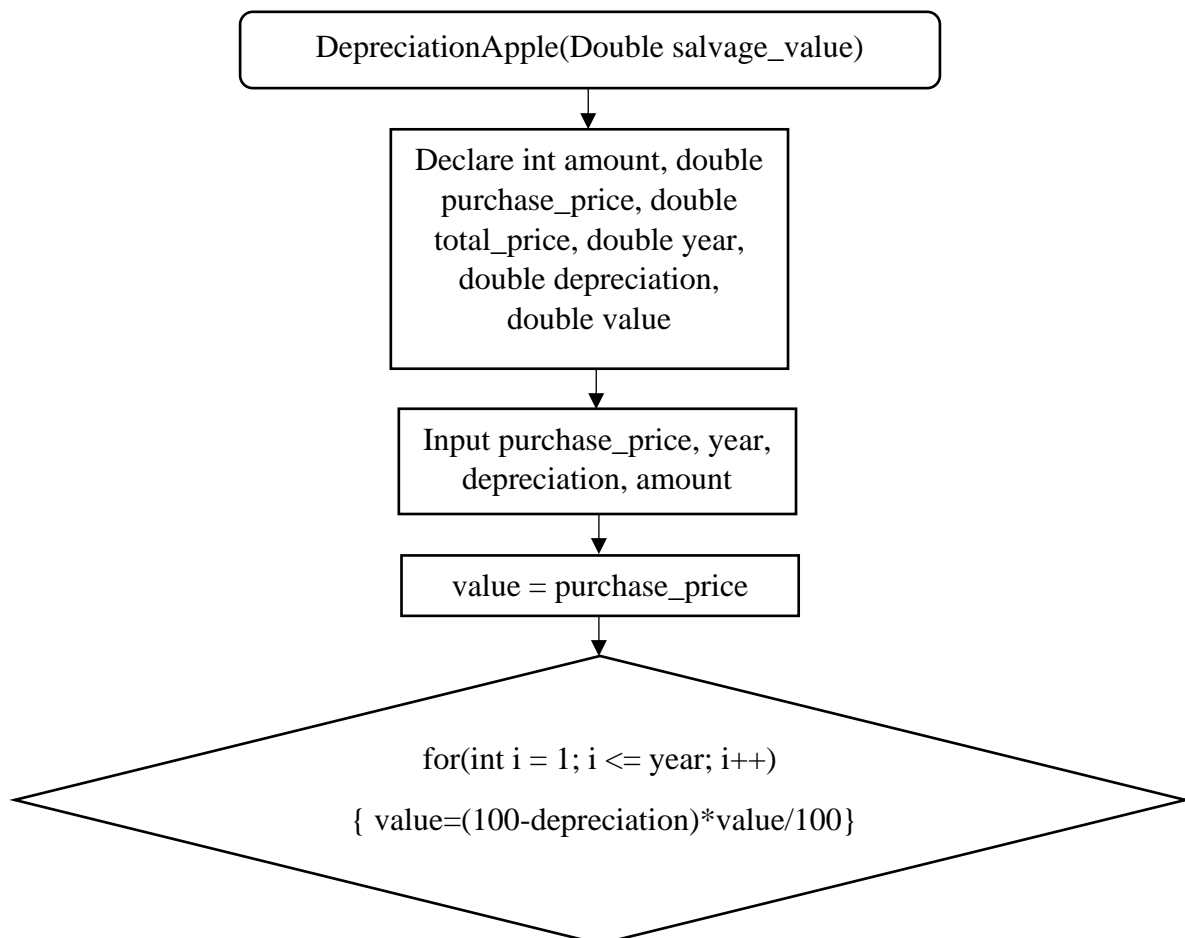
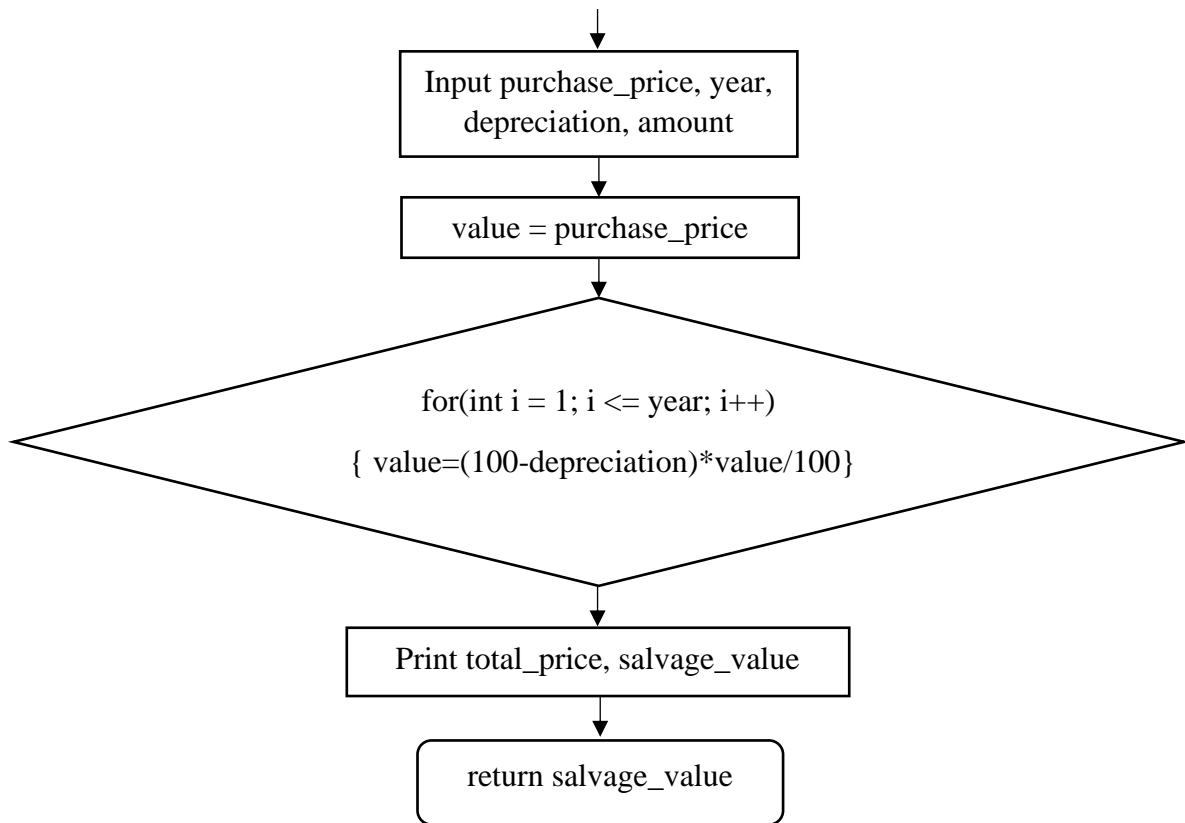


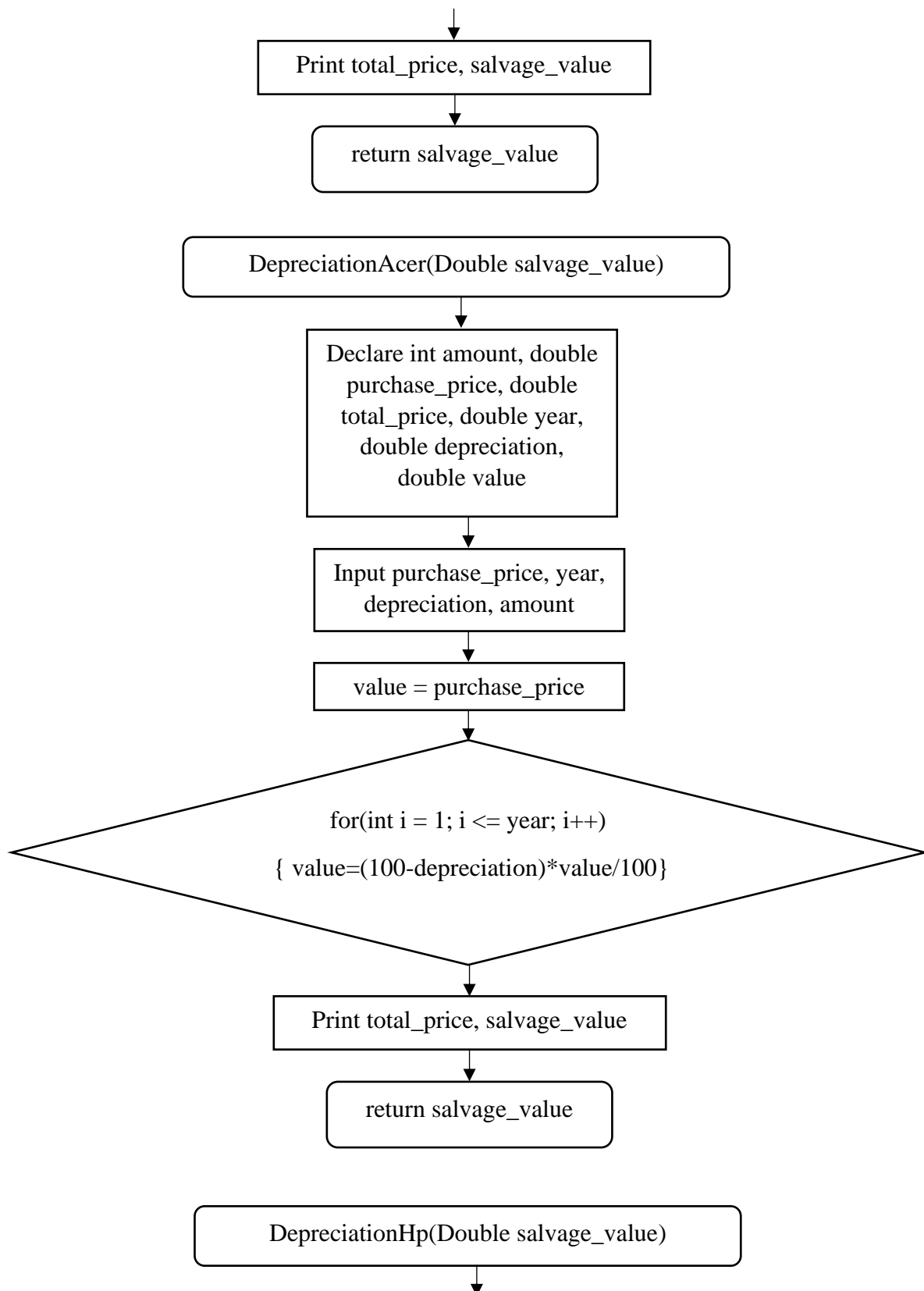


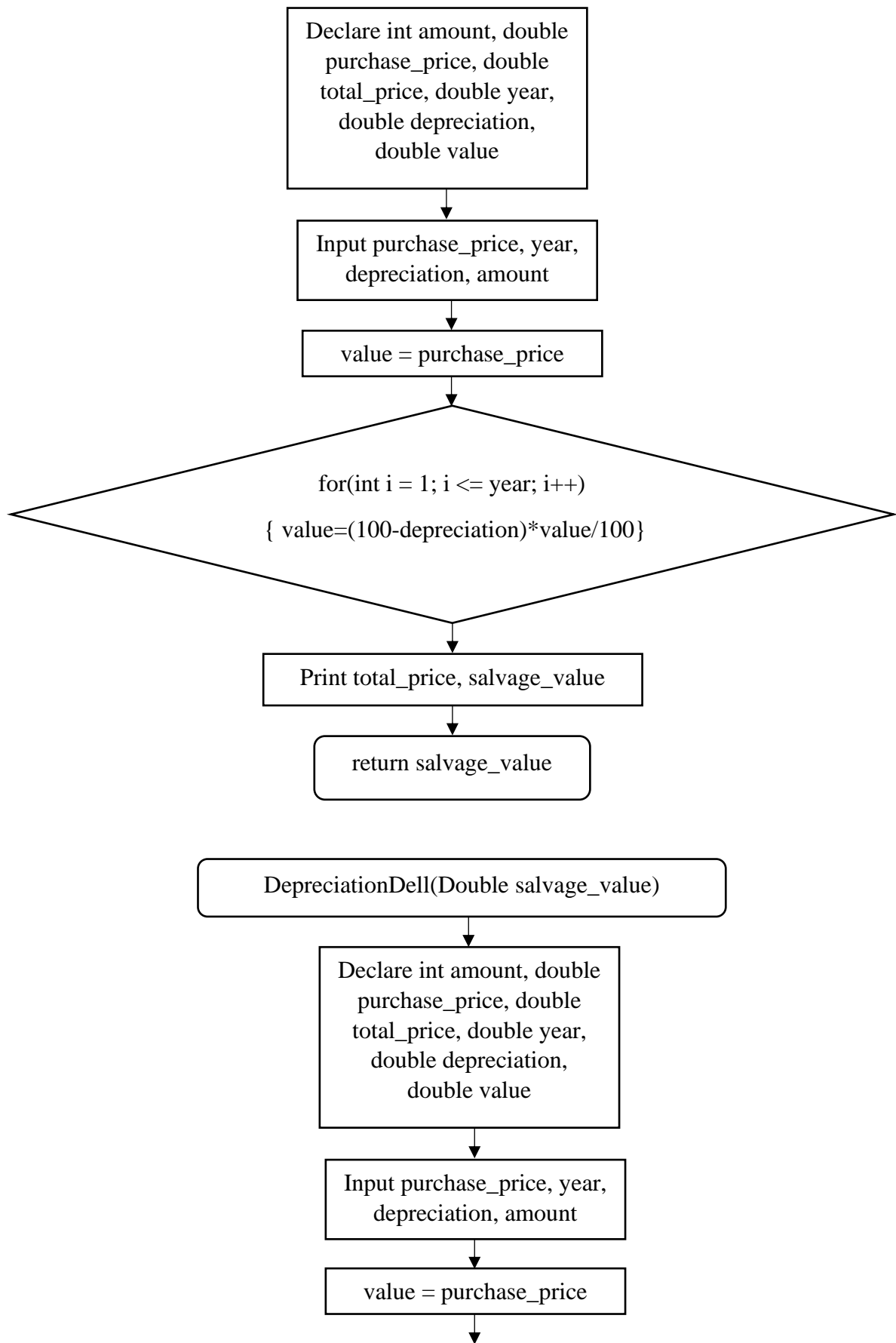


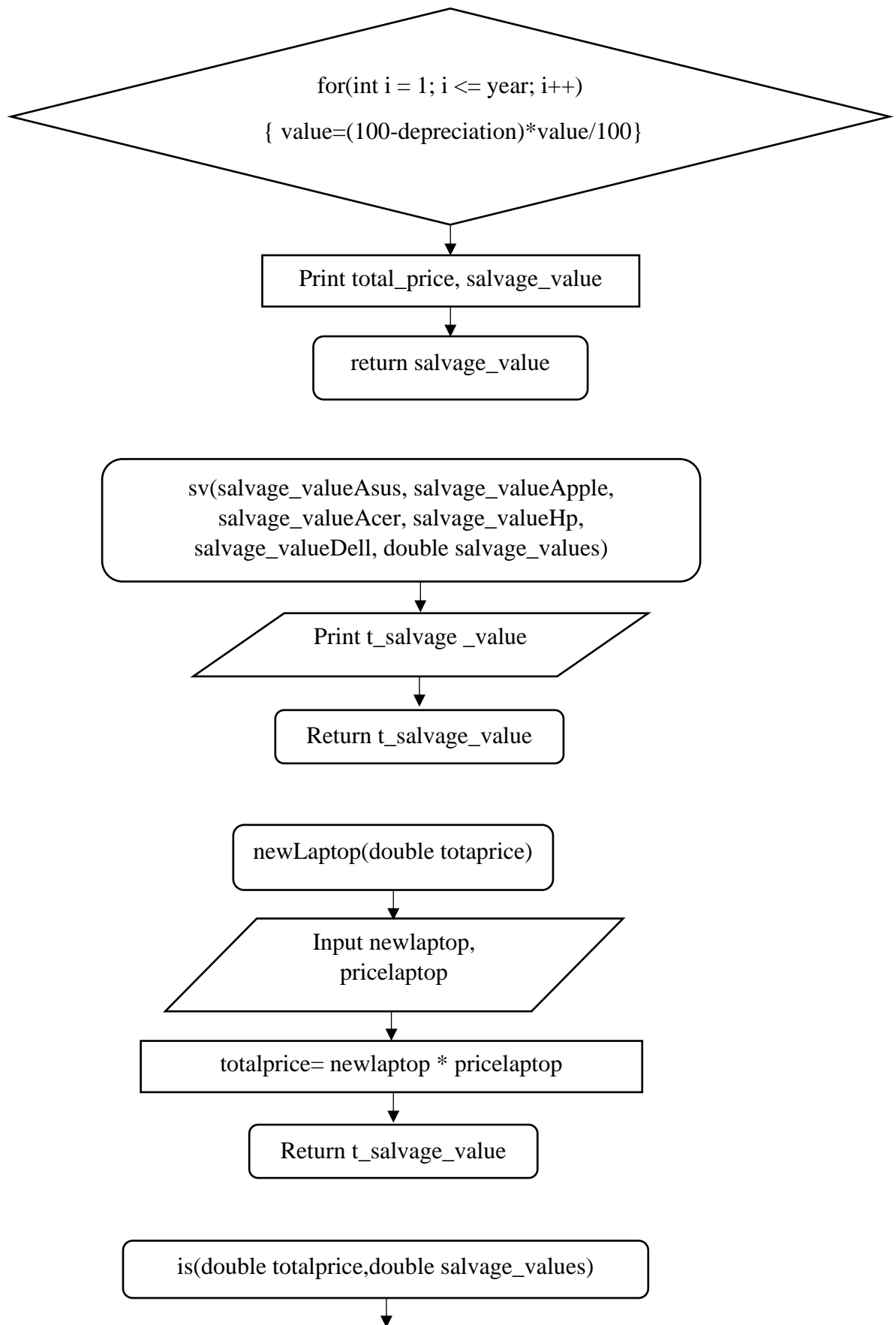


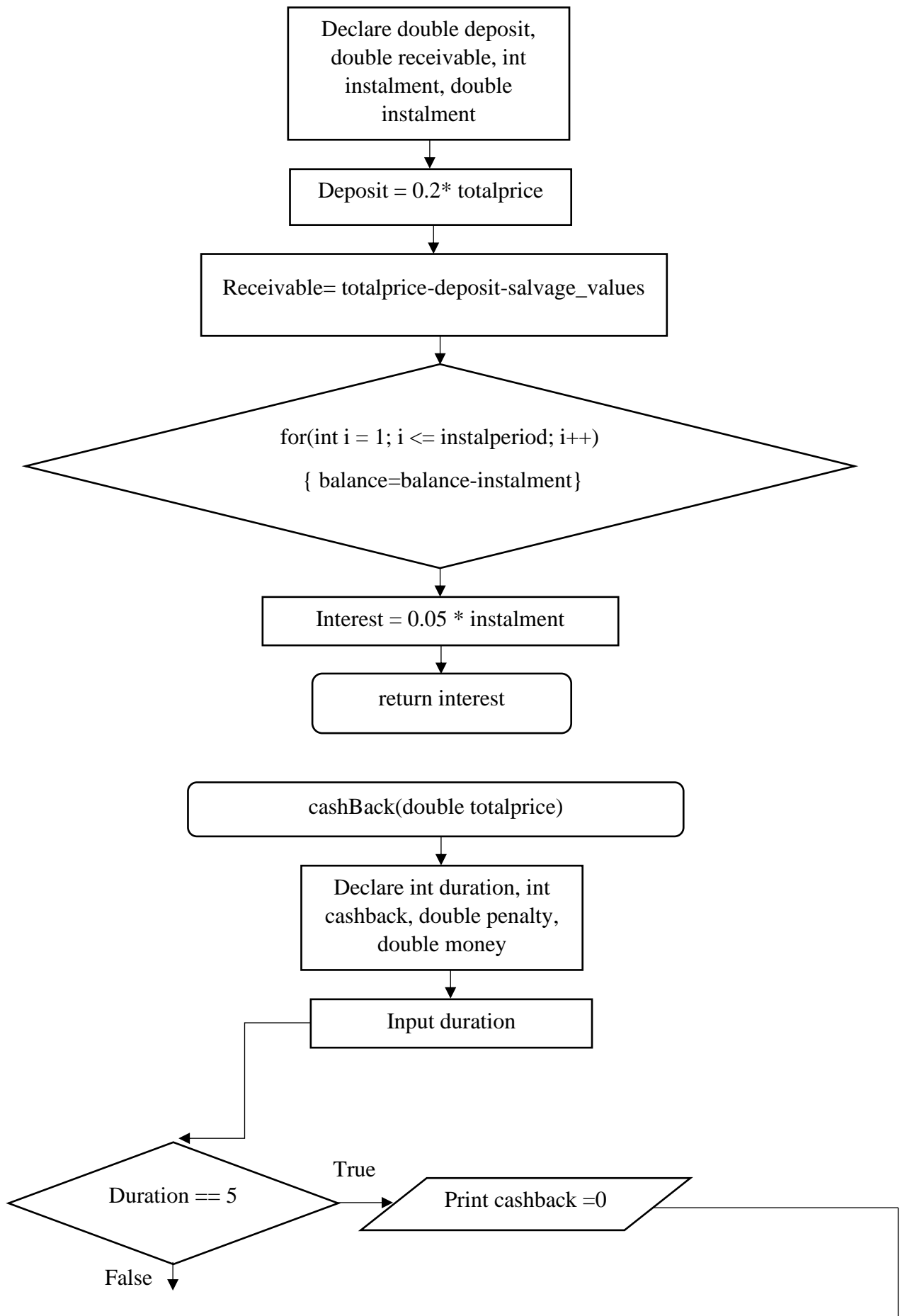




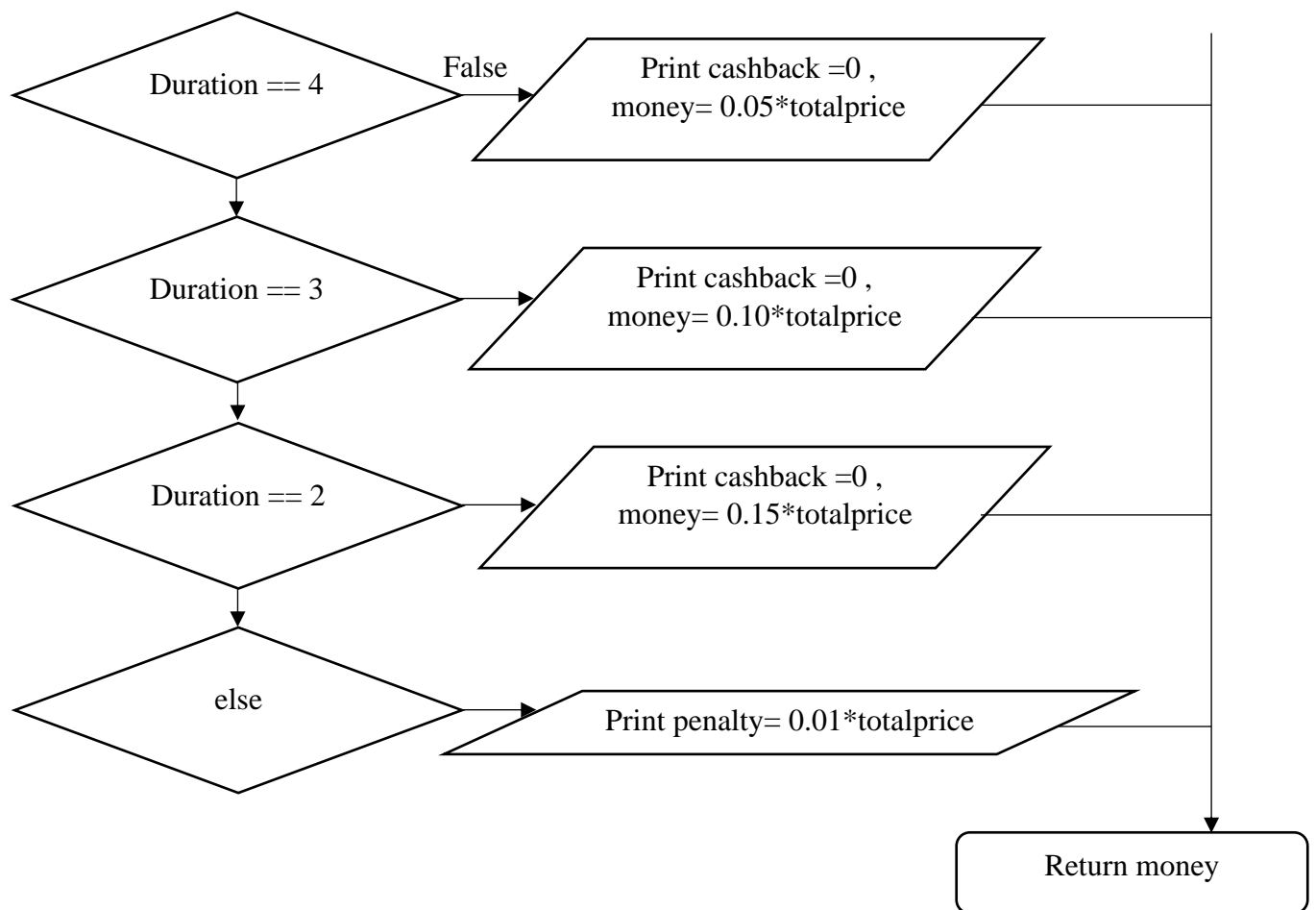












## 4.0 SATELLITE

### UNDERSTAND THE PROBLEM

A satellite is an object in space that orbits or circles around a bigger object. There are dozens of natural satellites in the solar system, and even more artificial ones. Saturn, for example, has at least 53 natural satellites, and between 2004 and 2017, it also had an artificial one. Satellites must be small, lightweight, and durable to survive in the harsh conditions of space. They must operate at very high reliability of more than 99.9 percent in the vacuum of space with no prospect of maintenance or repair. In addition, they must be light, as the cost of launching a satellite is based on weight. A communications satellite is an artificial satellite that relays and amplifies radio telecommunication signals via a transponder; it creates a communication channel between a source transmitter and a receiver at different locations on Earth.

Communications satellites are used for television, telephone, radio, internet, and military applications. Most communications satellites are in geostationary orbit 22,300 miles (35,900 km) above the equator, so the satellite appears stationary at the same point in the sky.

Satellites are operated by systems based on earth, which are key targets of cybercriminals who look for security loopholes as a potential for hacking into the satellite system. Satellite problems sometimes cause our data to be exposed and used for the benefit of others. This is because it is easy to access by hackers. This will make their data no longer secure and a danger to their safety.

### **ALTERNATIVE WAYS**

Create a new high-security system for communications satellites to not intrude on the privacy of others. The public can use this system to gain security access that can secure their information data. Therefore, they do not have to worry about their data security.

### **BEST WAY**

Users use security systems that can help them keep their data safe from being compromised by hackers. Users must be careful in choosing a security system so that they can protect their data. With the existence of this security system, they no longer have to be afraid of their data as it uses a very strict security system

### **INSTRUCTIONS FOR SELECTED SOLUTIONS**

- i.** User needs to fill in personal information such as name and age.
- ii.** After that, users can create an account and enter new password validation for security. If the user enters the wrong answer, the system will tell the user, they have only two chances to try again. After that, if still wrong, they have to wait five minutes to enter a new password.
- iii.** Users have to remember keywords and identify to make sure that is the user. The user has to enter the correct keyword, but if the user enters the wrong keyword system will tell the user only have one chance to enter the correct keyword.
- iv.** If someone wants to log in but that was not the user, a warning text will be given. Control structure selection (if and else statement) is used in which is the user has to choose two options which are Yes or No.
- v.** It will reduce the risk of being hacked.
- vi.** This system will calculate by using this formula:

The formula is:

$$\text{risk} = (\text{threat} \times \text{vulnerability} \times \text{probability of occurrence})$$

## EVALUATION TABLE

Regarding this solution, users need to follow the procedure to obtain this security system. Aside from that, the problem of information leakage no longer endangers users due to the security measures provided by us.

## CALCULATION TABLE

For Threat: -

| Threat                                                                                  | Amount | Formula                                            | Probability of Occurrence |
|-----------------------------------------------------------------------------------------|--------|----------------------------------------------------|---------------------------|
| Hijack your usernames and passwords.                                                    | 90     | $P(A) = \frac{n(A)}{n(S)}$ $= \frac{90}{6}$ $= 15$ | 15                        |
| Steal your money and open credit card and bank accounts in your name.                   | 85     | $P(A) = \frac{n(A)}{n(S)}$ $= \frac{85}{6}$ $= 14$ | 14                        |
| Ruin your credit.                                                                       | 60     | $P(A) = \frac{n(A)}{n(S)}$ $= \frac{60}{6}$ $= 10$ | 10                        |
| Request new account Personal Identification Numbers (PINs) or additional credit cards.  | 50     | $P(A) = \frac{n(A)}{n(S)}$ $= \frac{50}{6}$ $= 8$  | 8                         |
| Use and abuse your Social Security number.                                              | 86     | $P(A) = \frac{n(A)}{n(S)}$ $= \frac{86}{6}$ $= 14$ | 14                        |
| Sell your information to other parties who will use it for illicit or illegal purposes. | 90     | $P(A) = \frac{n(A)}{n(S)}$ $= \frac{90}{6}$ $= 15$ | 15                        |
| TOTAL                                                                                   | 461    |                                                    | 76                        |

For Vulnerability: -

| Vulnerability              | Amount | Formula                                            | Probability of Occurrence |
|----------------------------|--------|----------------------------------------------------|---------------------------|
| Broken authentication      | 60     | $P(A) = \frac{n(A)}{n(S)}$ $= \frac{60}{4}$ $= 15$ | 15                        |
| Cross-Site Scripting       | 77     | $P(A) = \frac{n(A)}{n(S)}$ $= \frac{77}{4}$ $= 19$ | 19                        |
| Cross-Site Request Forgery | 70     | $P(A) = \frac{n(A)}{n(S)}$ $= \frac{70}{4}$ $= 17$ | 17                        |
| Security Misconfiguration  | 89     | $P(A) = \frac{n(A)}{n(S)}$ $= \frac{89}{4}$ $= 22$ | 22                        |
| TOTAL                      | 296    |                                                    | 73                        |

The formula is:

$$\text{risk} = (\text{threat} \times \text{vulnerability} \times \text{probability of occurrence})$$

$$\text{risk} = (6 \times 4 \times 149)$$

$$= 3576$$

## ALGORITHM

- User has to insert personal information such as name, age, phone number, email address, and password.

- ii. After that, the user inserts the same password same as personal information. Users have only two chances to enter the correct password. If still wrong, they have to wait five minutes to enter a new password.
- iii. User enters the validation such as password, and keyword.
- iv. User enters the keyword. Users only have one chance to enter the correct keyword.
- v. Warning text. The user has to choose two option which is Yes or No. If click Yes, the system will print out the block and report meanwhile if click No system will print out everything will be at your own risk.
- vi. Calculate risk = (threat x vulnerability x probability of occurrence).
- vii. Calculate the total each threat probability:

```

int p1 = p1 = a1 /s
int p2 = p2 = a2 /s
int p3 = p3 = a3 /s
int p4 = p4 = a4 /s
int p5 = p5 = a5 /s
int p6 = p6 = a6 /s
int a1
int a2
int a3
int a4
int a5
int a6
int s = 6

```

### **Switch**

#### **case 1:**

Print: Hijack your usernames and passwords.

P1 = 15

**break;**

#### **case 2:**

Print: Steal your money and open credit card and bank accounts in your name.

P2= 14

**break;**

**case 3:**

Print: Ruin your credit.

P3 = 10

**break;**

**case 4:**

Print: Request new account Personal Identification Numbers (PINs) or additional credit cards.

P4 = 8

**break;**

**case 5:**

Print: Use and abuse your Social Security number.

P5 = 14

**break;**

**case 6:**

Print: Sell your information to other parties who will use it for illicit or illegal purposes.

P6 = 15

**break;**

Total amount

total1 = a1 + a2 + a3 + a4 + a5 + a6;

Total probability

total2 = p1 + p2 + p3 + p4 + p5 + p6;

viii. Calculate the total each vulnerability probability:

int p7 = p7 = a7 /s

int p8 = p8 = a8 /s

int p9 = p9 = a9 /s

int p10 = p10 = a10 /s

```
int a7
int a8
int a9
int a10
int s = 4
```

Total amount

```
total3 = a7 + a8 + a9 + a10;
```

Total probability

```
total4 = p7 + p8 + p9 + p10;
```

xi. Calculate total risk:

$$\text{risk} = (\text{threat} \times \text{vulnerability} \times \text{probability of occurrence})$$
$$\text{risk} = (s * s1 * \text{probability of occurrence});$$

## **PSEUDOCODE**

Start

Method read package ()

Method personal information security systems ().

Users insert personal information such as name, age, phone number, email address, and password.

Method register ().

Inserts the same password same as personal information in the register. Users have only two chances to enter the correct password. If still wrong, they have to wait five minutes to enter a new password.

If (the user enters correct password).

Print message.

Your password is correct.

    Else if (the user enters the wrong password).

        Your password is wrong! You have two chances.

        If (the user enters the wrong password again).

            "Sorry, you need to wait 5 minutes to key in your  
password again!

            Print message.

End if

Method validation ().

Insert validation such as password and keyword.

User insert keyword. Users only have one chance to enter the correct keyword.

If (the user enters the wrong keyword)

    Print message

        Invalid Keywords. Your keywords are wrong! You have only one chance.

        Please enter again

        Else if (the user enters the correct keyword)

            Repeat keywords. Enter keywords

            Print message

            Your keywords are correct. Identify

End if

Method warning text ().

Warning text. The user has to choose two option which is Yes or No.

If (the user enters "Yes")

    Print message

Block and report.



Else if (the user enters “No”)

Everything will be at your own risk.

Print message

End if

Method Threat Vulnerability Risk ().

Read threat

Method case name ().

Switch

**case 1:**

Print: Hijack your usernames and passwords.

P1 = 15

**break;**

**case 2:**

Print: Steal your money and open credit card and bank accounts in your name.

P2= 14

**break;**

**case 3:**

Print: Ruin your credit.

P3 = 10

**break;**

**case 4:**

Print: Request new account Personal Identification Numbers (PINs) or additional  
credit

cards.

P4 = 8

**break;**

**case 5:**

Print: Use and abuse your Social Security number.

$P5 = 14$

**break;**

**case 6:**

Print: Sell your information to other parties who will use it for illicit or illegal purposes.

$P6 = 15$

**break;**

Calculate the amount of each threat:

Total amount

$total1 = a1 + a2 + a3 + a4 + a5 + a6;$

Calculate the amount of each threat probability of occurrence:

Total probability

$total2 = p1 + p2 + p3 + p4 + p5 + p6;$

Print total threat and probability of occurrence:

Total amount threat = 461

Read vulnerability

Using a method to print out Vulnerability ().

Calculate the amount of each vulnerability:

Total amount

$total3 = a7 + a8 + a9 + a10;$

Calculate the amount of each vulnerability probability of occurrence:

Total probability

total4 = p7 + p8 + p9 + p10;

Print total vulnerability and probability of occurrence:

Total amount vulnerability = 296

Total amount probability = 73

Read risk

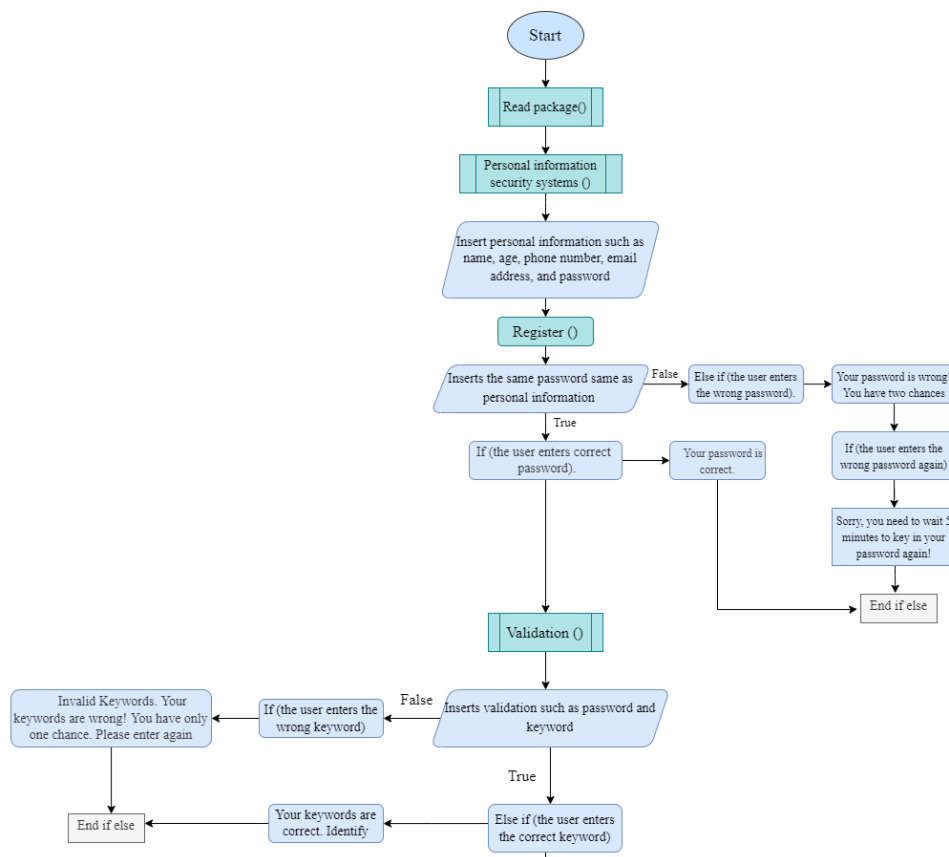
Using a method to print out Risk ().

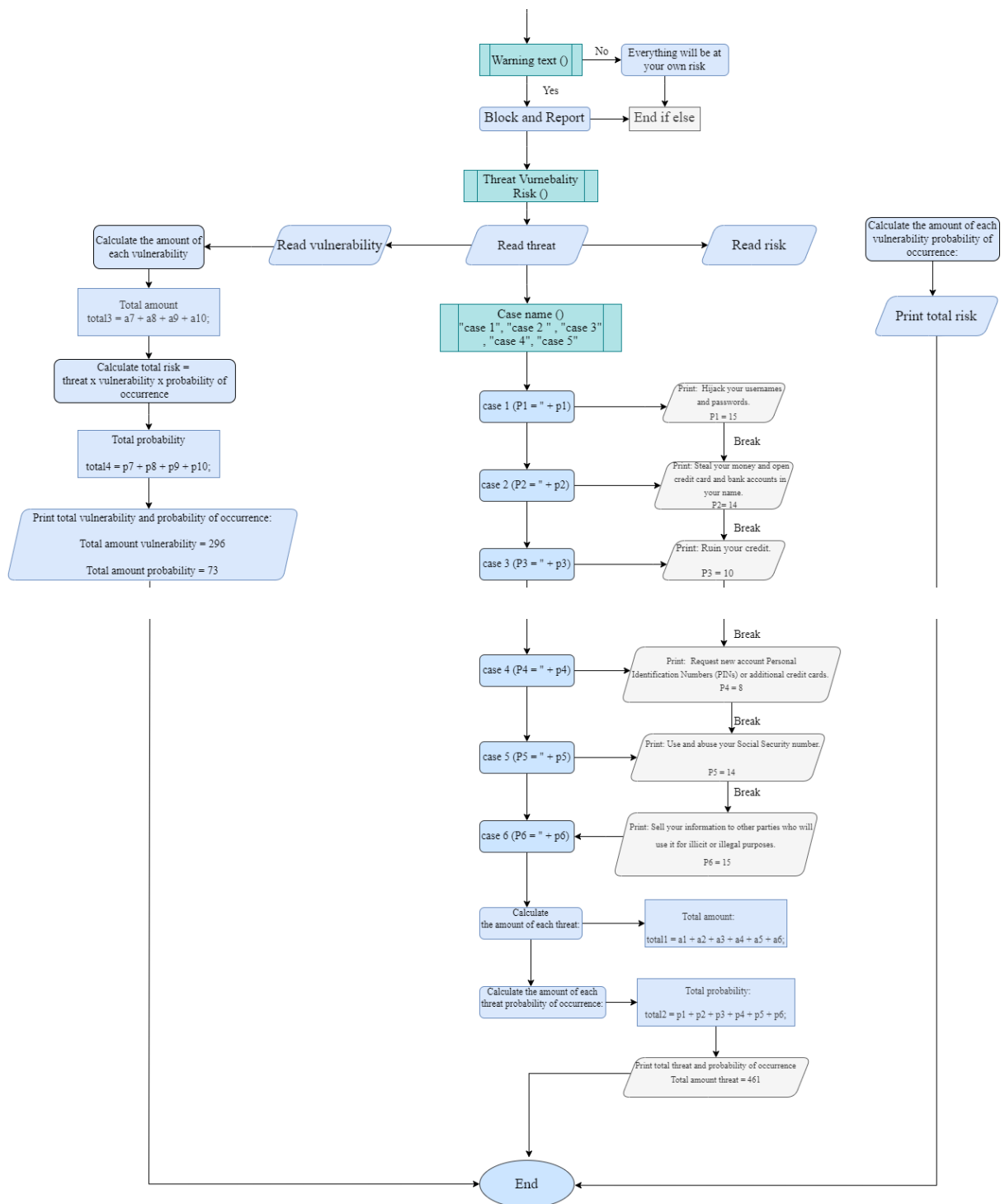
Calculate total risk = threat x vulnerability x probability of occurrence

Print total risk

End

## FLOW CHART





## 5.0 TV

### UNDERSTAND THE PROBLEM

Astro is a Malaysian satellite television and IPTV provider doing business as All-Asian Satellite Television and Radio Operator. It operates in Malaysia, Brunei through Kristal-Astro and Indonesia through Astro Nusantara. It broadcasts from Kuala Lumpur's All Asia Broadcast

Centre and Cyberjaya's MEASAT. In Malaysia, the corporation was reported to have 71% home penetration in 2016. The Malaysian federal government granted an exclusive licence to Astro as the exclusive pay-television provider till 2017. MEASAT Broadcast Network Systems Sdn. Bhd. operates Astro, which is a wholly-owned subsidiary of Astro Malaysia Holdings Berhad. Astro Malaysia Holdings Bhd is Southeast Asia's leading integrated media group with key operations in pay-TV, radio, content and digital. It is founded on June 1st 1996 by Ananda Krishnan. Astro broadcasts 183 channels including 54 HD channels, delivered via DTH satellite TV via the Measat satellite network, IPTV and OTT platforms. Its operating income decrease RM777.71 million (2014) and net income increase RM447.95 million (2014).

### **IDENTIFY THE PROBLEM**

New customers of Astro service are planning to purchase the Astro package but they are having problem to make a decision while choosing package offered. The customer wants to know the information related to Astro and want to seek for further information using the right path to reach for Astro. The customer needs some help from the Astro promoter but during the pandemic, it is a bit risky to go to the Astro centre.

### **ALTERNATIVE WAYS**

1. A program that can serve the customer.
2. The customer need to go to Astro centre to reach for help.
3. The customer need to find the nearest kiosk that have Astro promoter.
4. A phone call to the Astro hotline.
5. Customer need to search for the information online.

### **BEST WAY**

Online customer service programs can help customers with their problems related to packages offered. A program will provide information related to package offered such as number of channels, price, installation fee, discount and payment details. This program will guide customers to purchase the package and calculate the total payment.

### **INSTRUCTIONS FOR SELECTED SOLUTION**

1. The program will ask user to key in their name and phone number.
2. The program will display the options of packages from an array:
  - No 1 Astro primary pack
  - No 2 Astro entertainment pack
  - No 3 Astro broadband pack
  - No 4 Astro platinum pack.
3. Ask the user to key in their preference by entering the number of the package selected.
4. The program will call certain method for every package based on the key in package number as control selection using if/else statement.
5. The program will display the package information, calculate the total payment, and display payment details for a 2 years subscription contract with 2 payment option (deposit and monthly payment or fully payment) based on the number entered by user.

## EVALUATE SOLUTION

An online customer service programme makes it more convenient for the customer as they will feel comfortable making decisions because there is no line they need to wait for or an Astro worker waiting for them. They can take as much time as they want to think first before making any purchases and feel less burdened. Also, with online customer service, there will no longer be any hold time, as that is usually what happens in call centres. This programme will respond to the customer immediately. Besides, they can grab the opportunity to reach out to this online customer service at any time they are free to do so to save their time and money. This programme can also help them make price comparisons and make it easier for them to understand the information given to them. Plus, during the pandemic, this online customer service is a great idea for them to avoid the crowds and stay safe from the spread of the COVID-19 virus.

## CALCULATION TABLE

| TYPE OF PACKAGES | PAYMENT METHOD | FORMULA | TOTAL PAYMENT |
|------------------|----------------|---------|---------------|
|------------------|----------------|---------|---------------|

|                                                                                                                                                                                                                                                       |                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>ASTRO PRIMARY<br/>PACK</p> <p>*Price = RM 60.00<br/>*Installation fee<br/>= RM 99.00<br/>*24 months<br/>subscription contract<br/>*Up to 90+ Channels<br/>*Astro Go accessible<br/>*Support HD<br/>Channel<br/>*Free Ultra box<br/>Decoder Set</p> | 1. Deposit &<br>Monthly<br>Payment | <p>-Actual price = package price * 24 + installation bill<br/>(Actual price= 60.0 *24+ 99.0)</p> <p>-Discount1=0.10 *package price<br/>(Discount1=0.10 *60.0)</p> <p>-Price = package price - discount1 + (package price* 23) + installation bill<br/>(Price = 60.0 – 6.0 + (60.0* 23) + 99.0)</p> <p>-Deposit = package price - discount1 + installation bill<br/>(Deposit = 60.0 – 6.0+ 99.0)</p> <p>-Balance = 23* package price<br/>(Balance = 23* 60.0)</p> <p>-Monthly payment= Package price</p> | <p>Actual price<br/>= RM1 539.0</p> <p>Discount1<br/>=RM 6.0</p> <p>Price<br/>=RM 1 533.0</p> <p>Deposit<br/>=RM 153.0</p> <p>Balance<br/>=RM 1 380.0</p> <p>Monthly<br/>payment<br/>=RM 60.0</p> |
|                                                                                                                                                                                                                                                       | 2. Fully<br>Payment                | <p>-Actual price = package price * 24 + installation bill<br/>(Actual price= 60.0 *24+ 99.0)</p> <p>-Discount1=0.10 *package price<br/>(Discount1=0.10 *60.0)</p> <p>-Discount2 = 0.15* price<br/>(Discount2= 0.15 *(60.0 – 6.0 + (60.0* 23) + 99.0)</p> <p>-Total price = Actual price – discount1- discount2<br/>(Total Price= 1 539.0 -6 .0 -229.95)</p>                                                                                                                                             | <p>Actual price<br/>= RM1 539.0</p> <p>Discount1<br/>=RM 6.0</p> <p>Discount2<br/>=RM 229.95</p> <p>Total Price<br/>=RM 1 303.05</p>                                                              |

|                                                                                                                                                                                                                                                                                     |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p style="text-align: center;"><b>ASTRO<br/>ENTERTAINMENT<br/>PACK</b></p> <p>*Price = RM 90.00<br/>*Installation fee = RM 99.00<br/>*24 months subscription contract<br/>*Up to 105+ Channels<br/>*Astro Go accessible<br/>*Support HD Channel<br/>*Free Ultra box Decoder Set</p> | <p><b>1. Deposit &amp; Monthly Payment</b></p> | <p>-Actual price = package price * 24 + installation bill<br/>(Actual price= 90.0 *24+ 99.0)</p> <p>-Discount1=0.10 *package price<br/>(Discount1=0.10 *90.0)</p> <p>-Price = package price - discount1 + (package price* 23) + installation bill<br/>(Price = 90.0 – 9.0 + (90.0* 23) + 99.0)</p> <p>-Deposit = package price - discount1 + installation bill<br/>(Deposit = 90.0 – 9.0+ 99.0)</p> <p>-Balance = 23* package price<br/>(Balance = 23* 90.0)</p> <p>-Monthly payment= Package price</p> | <p>Actual price<br/>= RM 2 259.0</p> <p>Discount1<br/>=RM 9.0</p> <p>Price<br/>=RM 2 250.0</p> <p>Deposit<br/>=RM 180.0</p> <p>Balance<br/>=RM 2 070.0</p> <p>Monthly payment<br/>=RM 90.0</p> |
|                                                                                                                                                                                                                                                                                     | <p><b>2. Fully Payment</b></p>                 | <p>-Actual price = package price * 24 + installation bill<br/>(Actual price= 90.0 *24+ 99.0)</p> <p>-Discount1=0.10 *package price<br/>(Discount1=0.10 *90.0)</p> <p>-Discount2 = 0.15* price<br/>(Discount2= 0.15 *(90.0 – 9.0 + (90.0* 23) + 99.0)</p> <p>-Total price = Actual price – discount1- discount2<br/>(Total Price= 2 259.0 -9.0 -337.5)</p>                                                                                                                                               | <p>Actual price<br/>= RM 2 259.0</p> <p>Discount1<br/>=RM 9.0</p> <p>Discount2<br/>=RM 337.5</p> <p>Total Price<br/>=RM 1 912.5</p>                                                            |



|                                                                                                                                                                                                                                                                                                                                                  |                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p style="text-align: center;"><b>ASTRO<br/>BROADBAND<br/>PACK</b></p> <p>*Price = RM 140.00<br/>*Installation fee = RM 99.00<br/>*24 months subscription contract<br/>*Up to 90+ Channels TV and Radio<br/>*Unlimited HighSpeed Internet<br/>*Astro Go accessible<br/>*Support HD Channel<br/>*Free Ultra box Decoder Set, Modem and Router</p> | <p><b>1. Deposit &amp; Monthly Payment</b></p> | <p>-Actual price = package price * 24 + installation bill<br/>(Actual price= 140.0 *24+ 99.0)</p> <p>-Discount1=0.10 *package price<br/>(Discount1=0.10 *140.0)</p> <p>-Price = package price - discount1 + (package price* 23) + installation bill<br/>(Price = 140.0 – 14.0 + (140.0* 23) + 99.0)</p> <p>-Deposit = package price - discount1 + installation bill<br/>(Deposit = 140.0 – 14.0+ 99.0)</p> <p>-Balance = 23* package price<br/>(Balance = 23* 140.0)</p> <p>-Monthly payment= Package price</p> | <p>Actual price<br/>= RM 3 459.0</p> <p>Discount1<br/>=RM 14.0</p> <p>Price<br/>=RM 3 445.0</p> <p>Deposit<br/>=RM 225.0</p> <p>Balance<br/>=RM 3 220.0</p> <p>Monthly payment<br/>=RM 140.0</p> |
|                                                                                                                                                                                                                                                                                                                                                  | <p><b>2. Fully Payment</b></p>                 | <p>-Actual price = package price * 24 + installation bill<br/>(Actual price= 140.0 *24+ 99.0)</p> <p>-Discount1=0.10 *package price<br/>(Discount1=0.10 *140.0)</p> <p>-Discount2 = 0.15* price<br/>(Discount2= 0.15 *(140.0 – 14.0 + (140.0* 23) + 99.0)</p> <p>-Total price = Actual price – discount1- discount2<br/>(Total Price= 3 459 .0 -14.0 -516.75)</p>                                                                                                                                               | <p>Actual price<br/>= RM 3 459.0</p> <p>Discount1<br/>=RM 14.0</p> <p>Discount2<br/>=RM 516.75</p> <p>Total Price<br/>=RM 2 928.25</p>                                                           |

|                                                                                                                                                                                                                                    |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ASTRO PLATINUM PACK</b><br><br>*Price = RM 195.00<br>*Installation fee = RM 99.00<br>*24 months subscription contract<br>*Up to 145+ Channels<br>*Astro Go accessible<br>*Support UHD/4K Channel<br>*Free Ultra box Decoder Set | <b>1. Deposit &amp; Monthly Payment</b> | -Actual price = package price * 24 + installation bill<br>(Actual price= 195.0 *24+ 99.0)<br><br>-Disc1=0.10 *package price<br>(Disc1=0.10 *195.0)<br><br>-Price = package price - disc1 + (package price* 23) + installation bill<br>(Price = 195.0 – 19.5 + (195.0* 23) + 99.0)<br><br>-Deposit = package price - disc1 + installation bill<br>(Deposit = 195.0 – 19.5+ 99.0)<br><br>-Balance = 23* package price<br>(Balance = 23* 195.0)<br><br>-Monthly payment= Package price | Actual price<br>= RM 4 779.0<br><br>Discount1<br>=RM 19.5<br><br>Price<br>=RM 4 759.0<br><br>Deposit<br>=RM 274.5<br><br>Balance<br>=RM 4 485.0<br><br>Monthly payment<br>=RM 195.0 |
|                                                                                                                                                                                                                                    | <b>2. Fully Payment</b>                 | -Actual price = package price * 24 + installation bill<br>(Actual price= 195.0 *24+ 99.0)<br><br>-Disc1=0.10 *package price<br>(Disc1=0.10 *195.0)<br><br>-Disc2 = 0.15* price<br>(Disc2= 0.15 *(195.0 – 19.5+ (195.0* 23) + 99.0)<br><br>-Total price = Actual price – disc1- disc2<br>(Total Price= 4 779.0 -19.5 -713.925)                                                                                                                                                       | Actual price<br>= RM 4 779.0<br><br>Discount1<br>=RM 19.5<br><br>Discount2<br>=RM 713.925<br><br>Total Price<br>=RM 4 045.575                                                       |

## ALGORITHM

1. Programs will display message to greet the customer.

2. Program will ask customer to key in their personal info such as name and phone number.

3. Programs will display 4 options of packages from an array to customers.

No 1 Astro primary pack

No 2 Astro entertainment pack

No 3 Astro broadband pack

No 4 Astro platinum pack.

5. User key in the package number that they interested in.

7. Program will perform the task by calling several methods based on different number that entered by user.

8. Program will calculate the formula from certain method based on package choose by user:

Calculate actual price = package price\*24 + installation bill

Calculate discount1 = 0.10\*package price

Calculate deposit = package price- discount1 + installation bill

Calculate balance = package price\*23

Calculate price = (balance) + deposit

Calculate discount2 = 0.15\*price

Calculate total price = price- discount2

9. Program will display 2 types of discounts offered to customer such as 10% first month discount and 15% Wow discount.

10. Program will display 2 type of payment detail based on the calculation.

## **PSEUDOCODE**

Start

method main():

CALL astromenu

Output "Enter your package number here: -"

Input preference

if (preference= 1)

CALL primarypack

CALL info

CALL primarypackbill

else if (preference = 2)

CALL entertainmentpack

CALL info

```

 CALL entertainmentpackbill

 else if (preference == 3)
 CALL broadbandpack
 CALL info
 CALL broadbandpackbill

 else if (preference == 4)
 CALL platinumpack
 CALL info
 CALL platinumpackbill

 else
 Output "You entered the wrong number!"
 end if
RETURN

method void astromenu()
 String [] Packages = {"Primary Pack", "Entertainment Pack", "Broadband
 pack", "Platinum Pack"};
 Output "Welcome to Astro customer service!"
 Output "Enter your name"
 Input String name
 Output "Enter your phone number (+60)"
 Input int phonenum
 Output "Hello my dear customer Mr/Mrs" + name
 for (int i = 0; i < Packages.length; i++)
 Output Packages [i]
 end for
RETURN

method void primarypack()
 Output message "ASTRO PRIMARY PACK
 *Price = RM 60.00
 *Installation fee = RM 99.00
 *24 months subscription contract
 *Up to 90+ Channels
 *Astro Go accessible
 *Support HD Channel
 *Free Ultrabox Decoder Set"
RETURN

method void entertainmentpack()
 Output message "ASTRO ENTERTAINMENT PACK
 *Price = RM 90.00

```

- \*Installation fee = RM 99.00
- \*24 months subscription contract
- \*Up to 105+ Channels
- \*Astro Go accessible
- \*Support HD Channel
- \*Free Ultrabox Decoder Set”

RETURN

method void broadbandpack()

Output message “ASTRO BROADBAND PACK

- \*Price = RM 140.00
- \*Installation fee = RM 99.00
- \*24 months subscription contract
- \*Up to 90+ Channels TV and Radio
- \*Unlimited HighSpeed Internet
- \*Astro Go accessible
- \*Support HD Channel
- \*Free Ultrabox Decoder Set, Modem and Router”

RETURN

method void platinumpack()

Output message “ASTRO PLATINUM PACK

- \*Price = RM 195.00
- \*Installation fee = RM 99.00
- \*24 months subscription contract
- \*Up to 145+ Channels
- \*Astro Go accessible
- \*Support UHD/4K Channel
- \*Free Ultrabox Decoder Set”

RETURN

method void info()

Output “My dearest customers, we have provided some discount for you in conjunction with your first time purchased with Astro such as  
 -10% FIRST MONTH PURCHASE DISCOUNT for every package  
 -15% WOW DISCOUNT (for customers who skip deposit and paid fully payment) Here is your payment detail based on your package selected:  
 For your information, we offer two payment methods along with certain discount”

RETURN

method void primarypackbill()

double packageprice =60.00, actualprice, discount1, discount2, deposit, price,  
 totalprice,balance, installationbill = 99.00

```

Calculate actualprice = packageprice*24 + installationbill;
Calculate discount1 = 0.10*packageprice
Calculate deposit = packageprice- discount1 + installationbill
Calculate balance = packageprice*23
Calculate price = balance + deposit
Calculate discount2 = 0.15*price
Calculate totalprice = price- discount2;

```

```

Output message "METHOD 1: DEPOSIT AND MONTHLY PAYMENT
FOR 2 YEARS SUBSCRIPTION CONTRACT"

```

```

Output packageprice, installationbill, actualprice. discount1,
price,deposit,balance

```

```

Output message "METHOD 2: FULLY PAYMENT FOR 2 YEARS
SUBSCRIPTION CONTRACT "

```

```

Output actualprice, discount1, discount2, totalprice

```

```

RETURN

```

```

method void entertainmentpackbill()

```

```

double packageprice =90.00, actualprice, discount1, discount2, deposit, price,
totalprice,balance, installationbill = 99.00

```

```

Calculate actualprice = packageprice*24 + installationbill;
Calculate discount1 = 0.10*packageprice
Calculate deposit = packageprice- discount1 + installationbill
Calculate balance = packageprice*23
Calculate price = balance + deposit
Calculate discount2 = 0.15*price
Calculate totalprice = price- discount2;

```

```

Output message "METHOD 1: DEPOSIT AND MONTHLY PAYMENT
FOR 2 YEARS SUBSCRIPTION CONTRACT"

```

```

Output packageprice, installationbill, actualprice. discount1,
price,deposit,balance

```

```

Output message "METHOD 2: FULLY PAYMENT FOR 2 YEARS
SUBSCRIPTION CONTRACT "

```

```

Output actualprice, discount1, discount2, totalprice

```

```

RETURN

```

```

method void broadbandpackbill()

```

```

double packageprice =140.00, actualprice, discount1, discount2, deposit, price,
totalprice,balance, installationbill = 99.00

```

```

Calculate actualprice = packageprice*24 + installationbill;

```

Calculate discount1 = 0.10\*packageprice  
Calculate deposit = packageprice- discount1 + installationbill  
Calculate balance = packageprice\*23  
Calculate price = balance + deposit  
Calculate discount2 = 0.15\*price  
Calculate totalprice = price- discount2;

Output message "METHOD 1: DEPOSIT AND MONTHLY PAYMENT  
FOR 2 YEARS SUBSCRIPTION CONTRACT"

Output packageprice, installationbill, actualprice. discount1,  
price,deposit,balance

Output message "METHOD 2: FULLY PAYMENT FOR 2 YEARS  
SUBSCRIPTION CONTRACT "

Output actualprice, discount1, discount2, totalprice

RETURN

method void platinumpackbill()

double packageprice =195.00, actualprice, discount1, discount2, deposit, price,  
totalprice,balance, installationbill = 99.00

Calculate actualprice = packageprice\*24 + installationbill;  
Calculate discount1 = 0.10\*packageprice  
Calculate deposit = packageprice- discount1 + installationbill  
Calculate balance = packageprice\*23  
Calculate price = balance + deposit  
Calculate discount2 = 0.15\*price  
Calculate totalprice = price- discount2;

Output message "METHOD 1: DEPOSIT AND MONTHLY PAYMENT  
FOR 2 YEARS SUBSCRIPTION CONTRACT"

Output packageprice, installationbill, actualprice. discount1,  
price,deposit,balance

Output message "METHOD 2: FULLY PAYMENT FOR 2 YEARS  
SUBSCRIPTION CONTRACT "

Output actualprice, discount1, discount2, totalprice

RETURN

End

**FLOW CHART**

