Programming 1 (STIA1113)

ASSIGNMENT 1 TOPIC:

COMMUNICATION

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

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INTERNET

1.0 IDENTIFY 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 ad 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%0 in this category. 1/3 web customers say they expect to find sincere information about people on the Internet.

1.2 UNDERSTAND THE 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.

1.3 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.

1.4 BEST WAY

A program is created for users to gain information on how much data has been used. The program will calculate the data per minute, per hour, per month and the average of data used every day and given extra information on data usage for various activities.

1.5 INSTRUCTIONS FOR SELECTED SOLUTION

1. On the main menu, a quick instruction will appear where user can check daily data usage and will get extra information below.

2. User need to enter the data in megabytes and fill in the times in minutes, hours, and months.

3. The program will calculate the amount, total and average of data usage that has been filled in by using the formula as stated below:

Internet usage = data / time

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

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

4. After that, extra information will be given where the program will show how much data is used for the activities stated below:

a) Uploading or downloading photo

b) Streaming video

c) Streaming music

d) Emailing

e) Web surfing

f) Online gaming

g) social networking

7. Users need to fill in the amount such as photos, hours, and emails.

8. For example, a single photo used 5MB per photo. If user want to know how much data is used, the program will calculate using the formula as stated below:

Data usage per photo = 5 / photo

Formula for streaming video:

Data usage per hour standard definition video = 750/ hour of standard definition video

Data usage per hour high-definition video = 2000 / hour of high-definition video

Formula for streaming music:

Data usage per 4 minutes of song = 6.5 / total every 4 minutes of song

Formula for emailing:

Data usage per email = 0.02 / per email

Formula for web surfing:

Data usage per hour = 18 / hour of web surfing

Formula for online gaming:

Data usage per hour = 20 / hour of online gaming

Formula for social networking:

Data usage per hour = 51 / hour of social networking

1.6 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

1.7 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 number of photos, hours of standard definition video, high-definition video, total amount of every 4 minutes of songs, emails, hours of web surfing, online gaming, and social networking.

6. 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.

1.8 PSEUDOCODE

Start

Input d1, t1, t2, t3

Data usage per time given = d1 /t1, d1 / t2. d1 / t3

Output data usage per time given

Input s1, s2, s3

Total data usage = s1 + s2 + s3

Output total data usage

Input a1

Average data usage = (s1 + s2 + s3) /3

Output average data usage

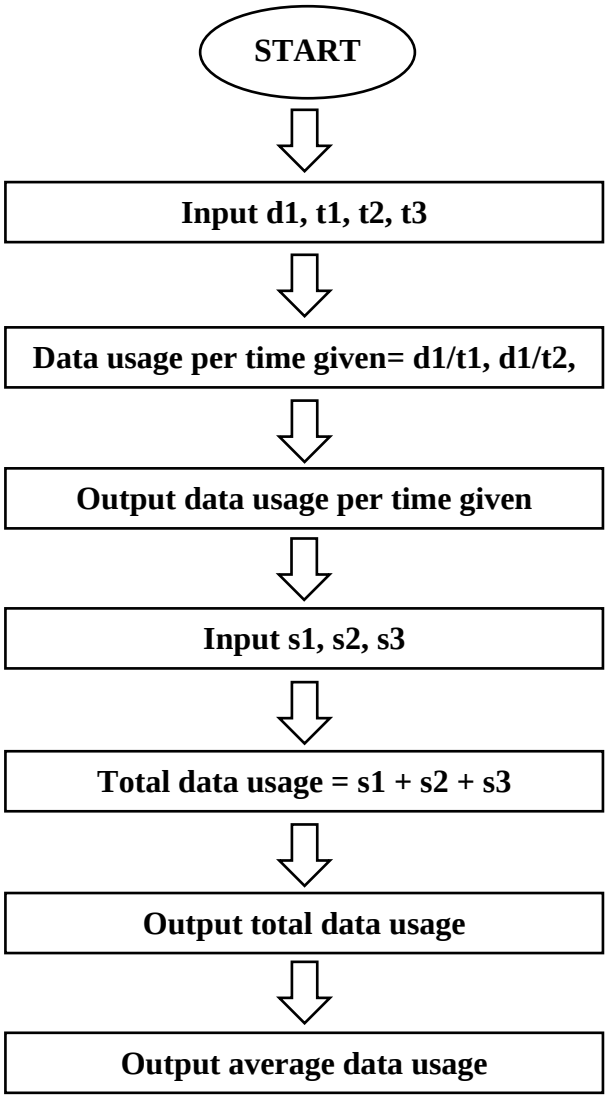
Input i1, i2, i3, i4, i5, i6, i7, i8,

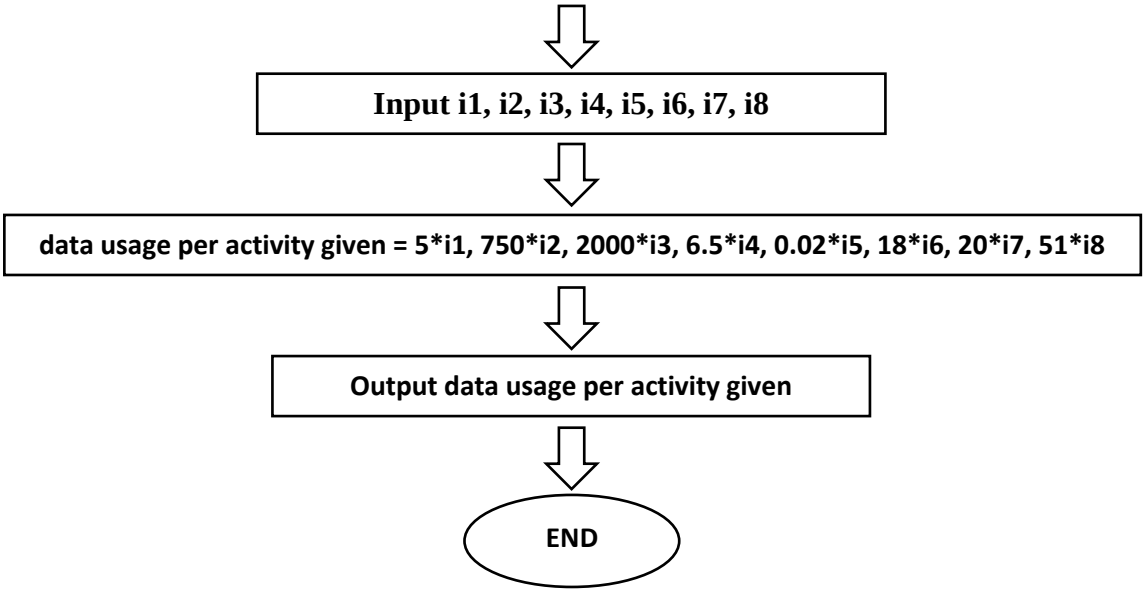
Data usage per activity given = 5*i1, 750*i2, 2000*i3, 6.5*i4, 0.02*i5, 18*i6, 20*i7, 51*i8

Output data usage per activity given

End

1.9 FLOW CHART




Input i1, i2, i3, i4, i5, i6, i7, i8
data usage per activity given = 5*i1, 750*i2, 2000*i3, 6.5*i4, 0.02*i5, 18*i6, 20*i7, 51*i8
Output data usage per activity given
END

MOBILE PHONE

2.0 IDENTIFY 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.

2.1 UNDERSTAND 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.

2.2 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 based on the weight of things and give a discount and then will calculate the instalment for customer for 1 years or 12 months for paying the payment with the interest rate.

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

2.3 BEST WAY

A program is created to help the consumers to purchase the accessories of mobile phone from the supplier can be easier. The program will total up the price, calculate the shipping fee based on the weight of things and give a discount and then will calculate the instalment for customer for 1 years or 12 months for paying the payment with the interest rate.

2.4 INSTRUCTIONS FOR SELECTED SOLUTIONS

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 quantity 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 quantity and that the consumers need on each configuration and accessories.

5. The program will calculate the price and the weight of accessories base on the quantity that customer key in on each configuration and accessories.

6. The program will calculate the shipping fee for the consumers and the total price

7. The program will calculate the total price after discount and the instalment rate

8. The program will calculate the fees that consumers should pay every month

9. The program will print out a receipt for the consumers as the reference.

2.5 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.

2.6 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	0.005Kg	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	0.002Kg	200	Price of Charger * Quantity 50 * 200	Weight of Charger * Quantity 0.002 * 200	RM 10000	0.4Kg
Phone Case	RM 10	0.001Kg	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

2.7 ALGORITHM

1. The consumers key in all the information detail such as name, identity card number, phone number and address.

2. The program will come out the configuration and accessories flow by flow for consumers to key in quantity they want to purchase from the supplier.

3. The accessories have processor, Ram, storage, camera, screen technology, battery, earbuds, screen protector, power bank, charger, and phone case.

4. The formula is below for each accessory:

Price of Processor = 2000 * Quantity

Price of Ram = 500 * Quantity

Price of storage = 400 * Quantity

Price of camera = 300 * Quantity

Price of screen technology = 1000 * Quantity

Price of battery = 300 * Quantity

Price of earbuds = 100 * Quantity

Price of screen protector = 50 * Quantity

Price of power bank = 100 * Quantity

Price of charger = 50 * Quantity

Price of phone case = 10 * Quantity

Weight of Processor = 0.02 * Quantity

Weight of Ram = 0.01 * Quantity

Weight of storage = 0.01 * Quantity

Weight of camera = 0.005 * Quantity

Weight of screen technology = 0.015 * Quantity

Weight of battery = 0.02 * Quantity

Weight of earbuds = 0.01 * Quantity

Weight of screen protector = 0.004 * Quantity

Weight of power bank = 0.5* Quantity

Weight of charger = 0.002 * Quantity

Weight of phone case = 0.001 * Quantity

5. The program will calculate the price and the weight of accessories base on the quantity that customer key in.

Formula:

Total Price of Accessories = Price of Processor + Price of Ram + Price of storage + Price of camera + Price of screen technology + Price of battery + Price of earbuds + Price of screen protector + Price of power bank + Price of charger + Price of phone case

Total Weight of Accessories = Weight of Processor + Weight of Ram + Weight of storage + Weight of camera + Weight of screen technology + Weight of battery + Weight of earbuds + Weight of screen protector + Weight of power bank + Weight of charger + Weight of phone case

6. The program will calculate the shipping fee for the consumers and the total price

Formula:

Shipping Fee = 5 * Total Weight of Accessories

Total Price = Total Price of Accessories + Shipping Fee

7. The program will calculate the total price after discount and the instalment rate

Formula:

Discount = Total Price * 0.02

Total Price After Discount = Total Price – Discount

Instalment Rate for 12 months = Total Price After Discount * 0.05

Total Price After Instalment Rate = Total Price After Discount + Instalment for 12 months

8. The program will calculate the fees that consumers should pay every month

Total Price Consumers Should Pay Every Month = Total Price After Instalment Rate /12

9. The program will print out a receipt for the consumers as the reference.

2.8 PSEUDOCODE

Start

Output Details of Shop

Output “Enter your name.”

Input name

Output “Enter your IC.”

Input IC

Output “Enter your phone number.”

Input phone number

Output “Enter your address.”

Input address

Output “This is our shop best processor: Snapdragon 888 and the price is RM 2000. Enter the quantity you want!”

Input quantity processor

Output “This is our shop biggest Ram: 8 GB Ram and the price is RM 250. Enter the quantity you want!”

Input quantity ram

Output “This is our shop biggest storage: 256 GB and the price is RM 400. Enter the quantity you want!”

Input quantity storage

Output “This is our shop best camera: 64 MP Camera and the price is RM 300. Enter the quantity you want!”

Input quantity camera

Output “This is our shop best screen technology: AMOLED and the price is RM 1000. Enter the quantity you want!”

Input quantity screen

Output “This is our shop best battery: Battery 6000 mAh and the price is RM 300. Enter the quantity you want!”

Input quantity battery

Output “This is our shop earbuds: Jabra Elite 75t Earbuds and the price is RM 1000. Enter the quantity you want!”

Input quantity earbuds

Output “This is our shop best screen protector: Maxboost Tempered Glass Screen Protector and the price is RM 50. Enter the quantity you want!”

Input quantity screen protector

Output “This is our shop best charger: RavPower Fast Wireless Charger and the price is RM 149. Enter the quantity you want!”

Input quantity charger

Output “This is our shop phone case, and the price is RM 10. Enter the quantity you want!”

Input quantity phone case

Calculate Total Price of accessories = total processor + total ram + total storage + total camera + total screen + total battery + totalearbuds + totalscreenprotector + totalpowerbank + totalcharger + totalphonecase

Calculate Totalweight = totalwprocessor + totalwram + totalwstorage + totalwcamera + totalwscreen + totalwbattery + totalwearbuds + totalwscreenprotector + totalwpowerbank + totalwcharger + totalwphonecase.

Calculate shipppingfee = Totalweight * 5

Calculate Total Price = Total Price of Accessories + Shipping Fee

Calculate discount = Total Price * 0.10

Calculate End Price = Total Price – discount

Calculate Instalment = End Price * 0.05

Calculate Total Price of Instalment = End Price + Instalment

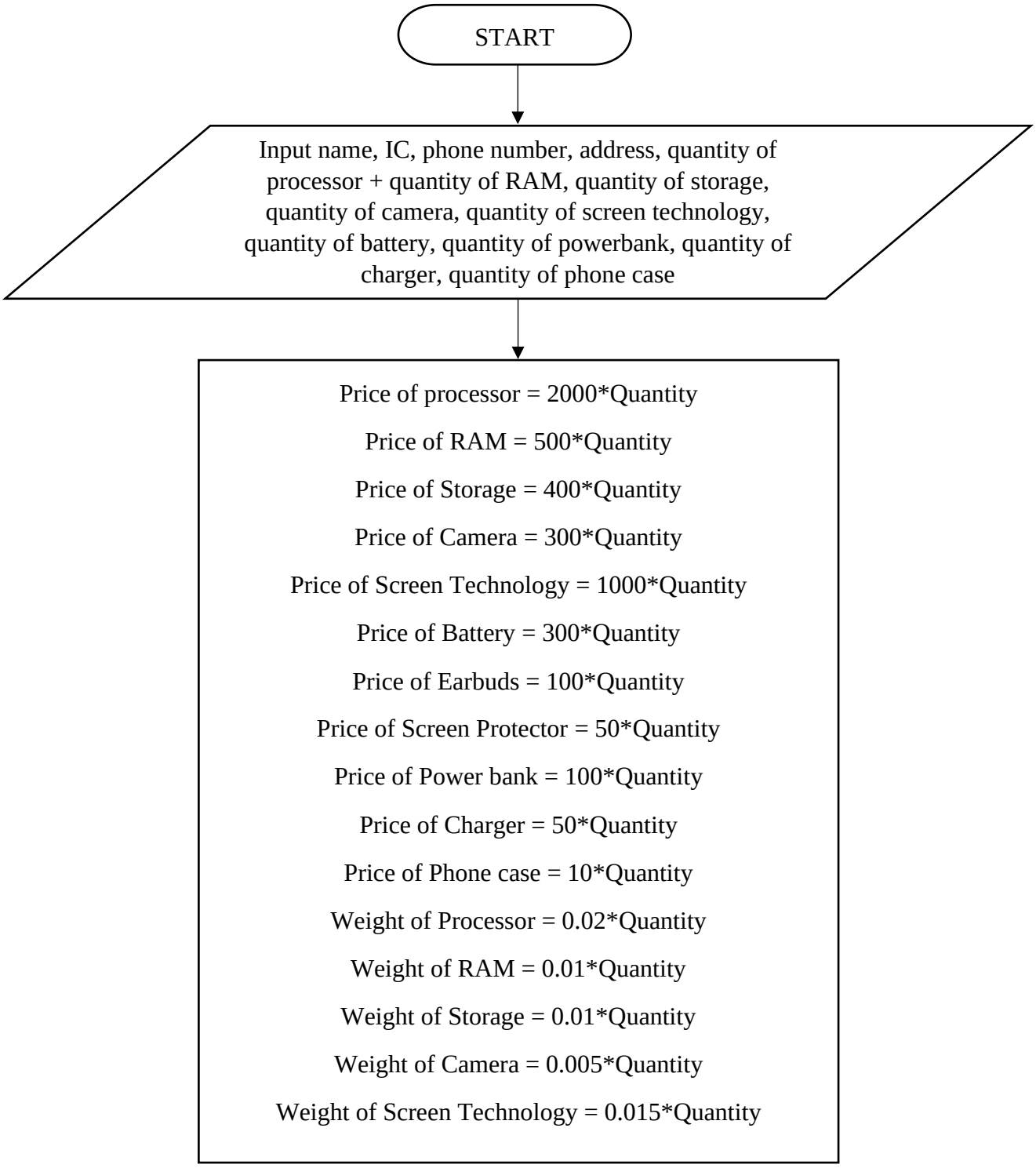
Calculate payment for 1 month = Total Price of Instalment/12

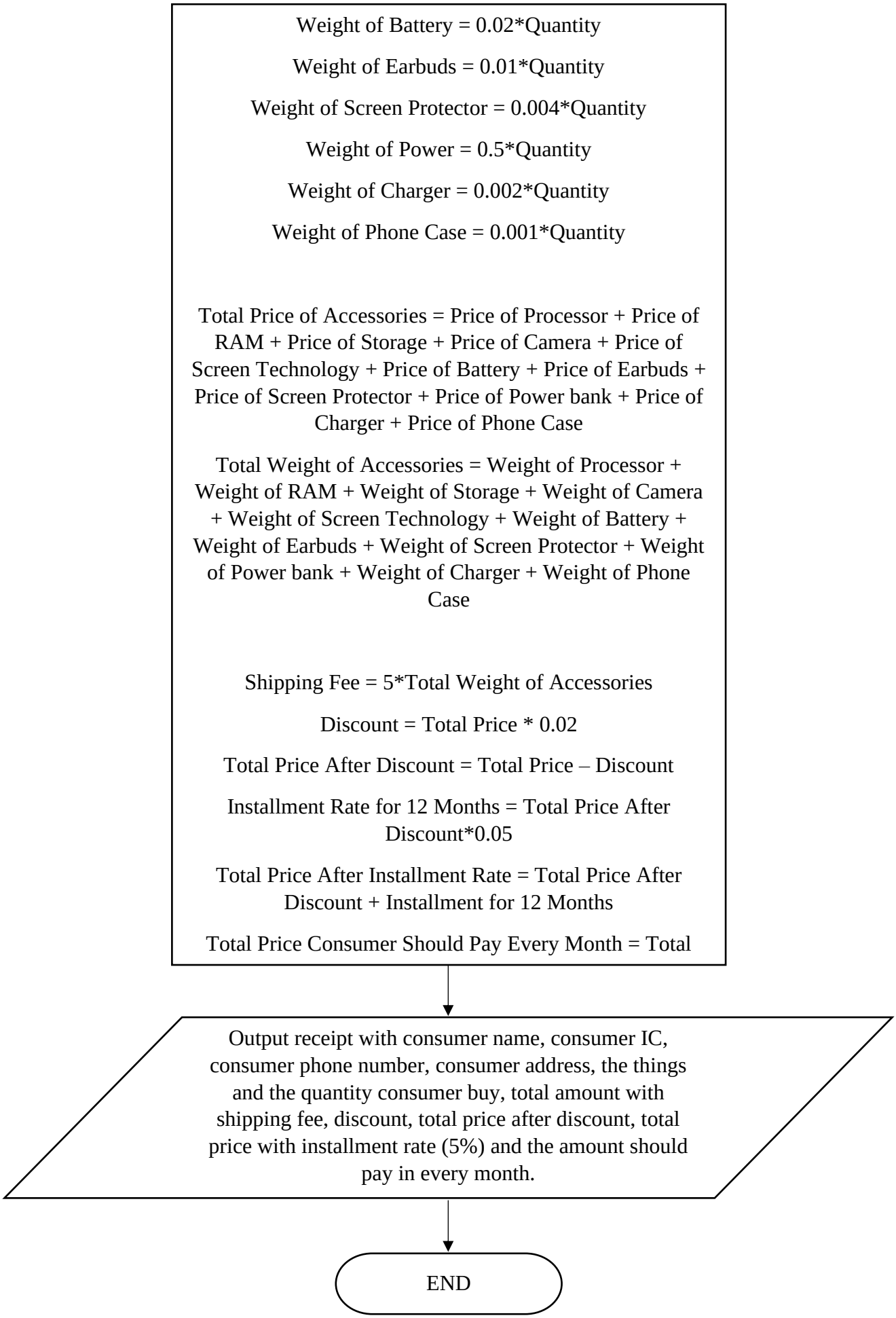
Output receipt with consumer name, consumer IC, consumer phone number, consumer address, the things and the quantity consumer buy, total amount with shipping fee, discount, total price after discount, total amount with instalment rate (5%) and the amount should pay in every month.

Output “Thank you. Please come again.”

End

2.9 FLOWCHART




Weight of Battery = 0.02*Quantity
Weight of Earbuds = 0.01*Quantity
Weight of Screen Protector = 0.004*Quantity
Weight of Power = 0.5*Quantity
Weight of Charger = 0.002*Quantity
Weight of Phone Case = 0.001*Quantity
Total Price of Accessories = Price of Processor + Price of RAM + Price of Storage + Price of Camera + Price of Screen Technology + Price of Battery + Price of Earbuds + Price of Screen Protector + Price of Power bank + Price of Charger + Price of Phone Case
Total Weight of Accessories = Weight of Processor + Weight of RAM + Weight of Storage + Weight of Camera + Weight of Screen Technology + Weight of Battery + Weight of Earbuds + Weight of Screen Protector + Weight of Power bank + Weight of Charger + Weight of Phone Case
Shipping Fee = 5*Total Weight of Accessories
Discount = Total Price * 0.02
Total Price After Discount = Total Price – Discount
Installment Rate for 12 Months = Total Price After Discount*0.05
Total Price After Installment Rate = Total Price After Discount + Installment for 12 Months
Total Price Consumer Should Pay Every Month = Total
Output receipt with consumer name, consumer IC, consumer phone number, consumer address, the things and the quantity consumer buy, total amount with shipping fee, discount, total price after discount, total price with installment rate (5%) and the amount should pay in every month.
END

LAPTOP

3.0 IDENTIFY 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 instalment for 5 years with an interest of 1% each year.

3.1 UNDERSTAND 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.

3.2 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

3.3 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 straight-line method.

3.4 INSTRUCTIONS FOR SELECTED SOLUTIONS

1. The old laptops in the company will be categorized in groups according to their useful life of assets which are 3 years, 4 years, and 5 years. The groups will be A, B and C.
2. The purchase cost of Group A will be RM 5500, B will be RM 4000 while C will be RM 3500.
3. The residual value of laptop A is RM 2000, laptop B is RM 1500, laptop C is RM 1000
4. The cost of the new laptop is RM 5000 each.
5. After all the information has been input, the coding will calculate the depreciation expense of the laptop and the accumulated depreciation depending on their useful life.
6. Input the quantity of new laptops sold in and calculate the total price of the laptops.
7. Calculate the total residual value.
8. Calculate the interest for each month and the money received together with the interest each month.

3.5 EVALUATE SOLUTION

Straight line depreciation is the most frequent method for depreciating a company's assets due to its easy and straightforward calculation. This method is used by dividing the asset's depreciable base by the asset's projected useful life. For instance, the yearly depreciation will be calculated as the depreciable base of $12,000 divided by five years, or $2,400 per year the asset is in service. Furthermore, we can also determine the amount of money that need to pay using the residual value because that is the maximum depreciation that can be expensed.

3.6 CALCULATION TABLE

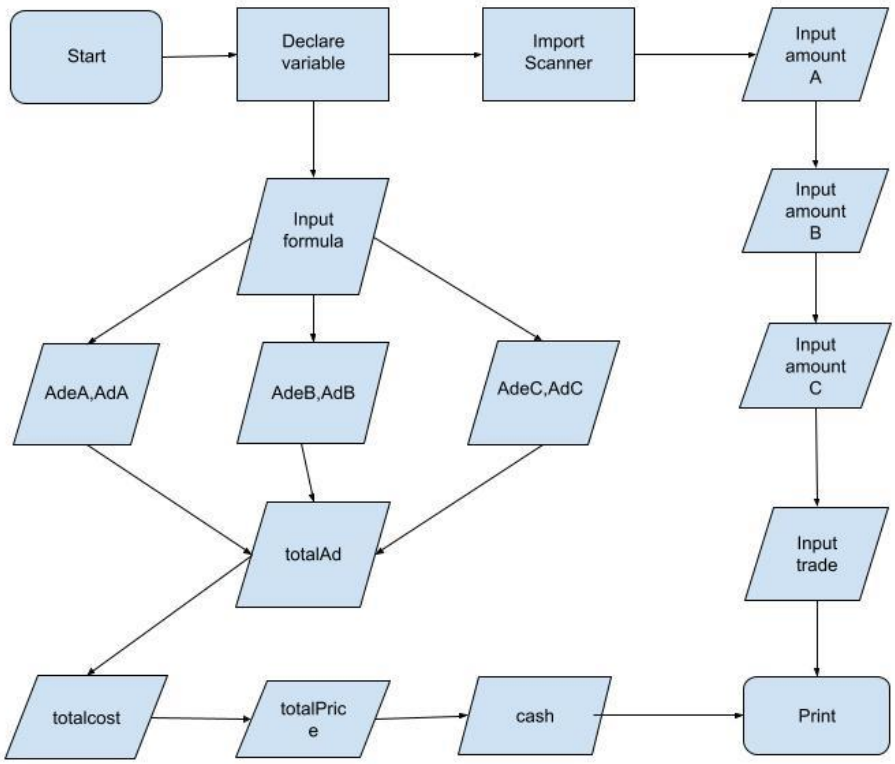
Groups	Details	Formula
Group A	costA: RM 5500 Residual, bookA: RM 2000 Useful life: 3 years Number of laptops in group A: a	Annual Depreciation Expense/ AdeA $= \frac{costA - Residual}{useful\ life} \times a$ Accumulated Depreciation Expense/ AdA $= AdeA \times useful\ life$
Group B	costB: RM 4000 Residua, bookB: RM 1500 Useful life: 4 years Number of laptops in group B: b	Annual Depreciation Expense/ AdeB $= \frac{costB - Residual}{useful\ life} \times b$ Accumulated Depreciation Expense/ AdB $= AdeB \times useful\ life$
Group C	costC: RM 3500 Residual, bookC: RM 1000 Useful life: 5 years Number of laptops in group C: c	Annual Depreciation Expense/ AdeC $= \frac{costC - Residual}{useful\ life} \times c$ Accumulated Depreciation Expense/ AdC $= AdeC \times useful\ life$
Total	Total cost of old laptops: x Total residual value: y Total of old laptops traded in: z	$x = (costA \times a) + (costB \times b) + (costC \times c)$ $y = (bookA \times a) + (bookB \times b) + (bookC \times c)$ $z = a + b + c$
New laptop	Total price: p Number of new laptops sold:n costNew: RM 5000	$p = n \times RM\ 5000$
Cash received	Interest: 1% per year Length of instalment: 5 years Interest per month:i Total money will receive: m Money received with interest per month:e	$i = \frac{1\% \times m}{12}$ $e = (m \div 5 \div 12) + i$

3.7 PSEUDOCODE

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

1. Import scanner
2. Initialize variables according to their useful life of old laptop, purchase cost of old laptop, book value and price of new laptop.
3. Input the amount of Group A, Group B and Group C.
4. Input the formula for calculating annual depreciation and accumulated depreciation for each group
5. Print out value for Annual Depreciation and Accumulated Depreciation for each group.
6. Input the formula for total accumulated for all groups, the total purchase cost of old laptops, the total book value, and the number of old laptops traded out.
7. Print out the total accumulated for all groups, the total purchase cost of old laptops, the total book value, and the number of old laptops traded out.
8. Input the number of new laptops traded in, formula for the total price of new laptops and the amount of cash needed.
9. Print total price of new laptops and the money received together with interest.

3.8 FLOW CHART



SATELLITE

4.0 IDENTIFY THE PROBLEM

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 that 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 personal 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 personal data no longer secure and a danger to their safety.

4.1 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.

4.2 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.

4.3 INSTRUCTIONS FOR SELECTED SOLUTIONS

5. User needs to fill in personal information such as name and age.
6. After that, users can create an account and enter new password validation for security
7. Users have to remember keywords and identify to make sure that is the user.
8. After getting all the information, users have to accept the terms and conditions that will be given to make sure users agree or do not agree.
9. If someone wants to log in but that was not the user, a warning text will be given.
10. It will reduce the risk of being hacked.

11. This system will calculate by using this formula:

The formula is:

risk = (threat x vulnerability x probability of occurrence)

4.4 EVALUATE SOLUTION

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.

4.5 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) = n (A) / n (S) = 90 / 6 = 15	15
TOTAL	461		76

For Vulnerability: -

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

The formula is:

risk = (threat x vulnerability x probability of occurrence)

risk = (6 x 4 x 149)

= 3576

4.6 ALGORITHM

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

ii. After that, the user inserts the same password same as personal information.

iii. User insert validation such ad username, password and keyword.

iv. User insert keyword.

v. Warning text.

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

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:

risk = (threat x vulnerability x probability of occurrence)

risk = (s*s1*probability of occurrence).

4.7 PSEUDOCODE

Start

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

Inserts the same password same as personal information.

Insert validation such as username, password, and keyword.

Users insert keyword.

Warning text.

Read threat

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

Total amount probability = 76

Read 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

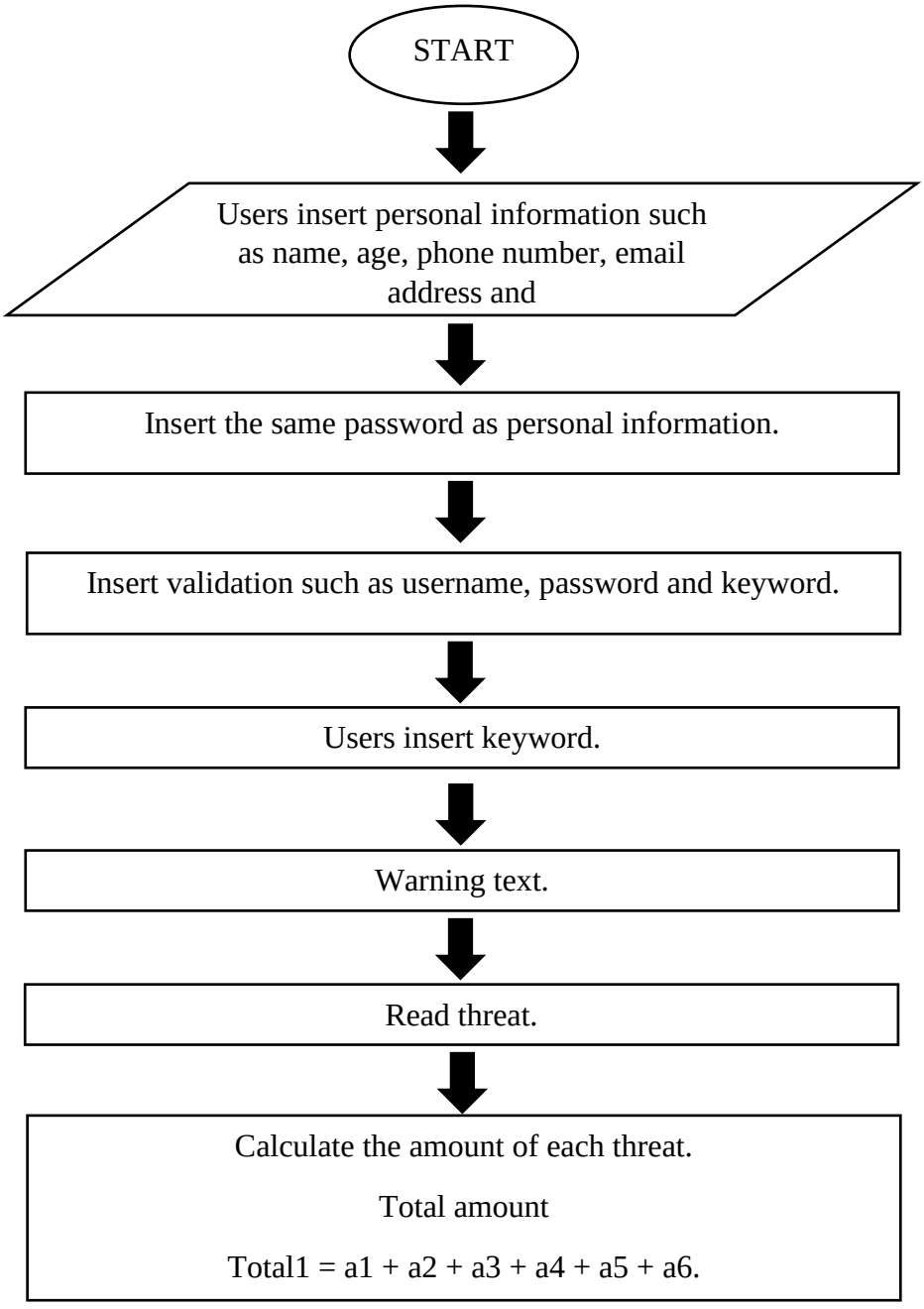
Read risk

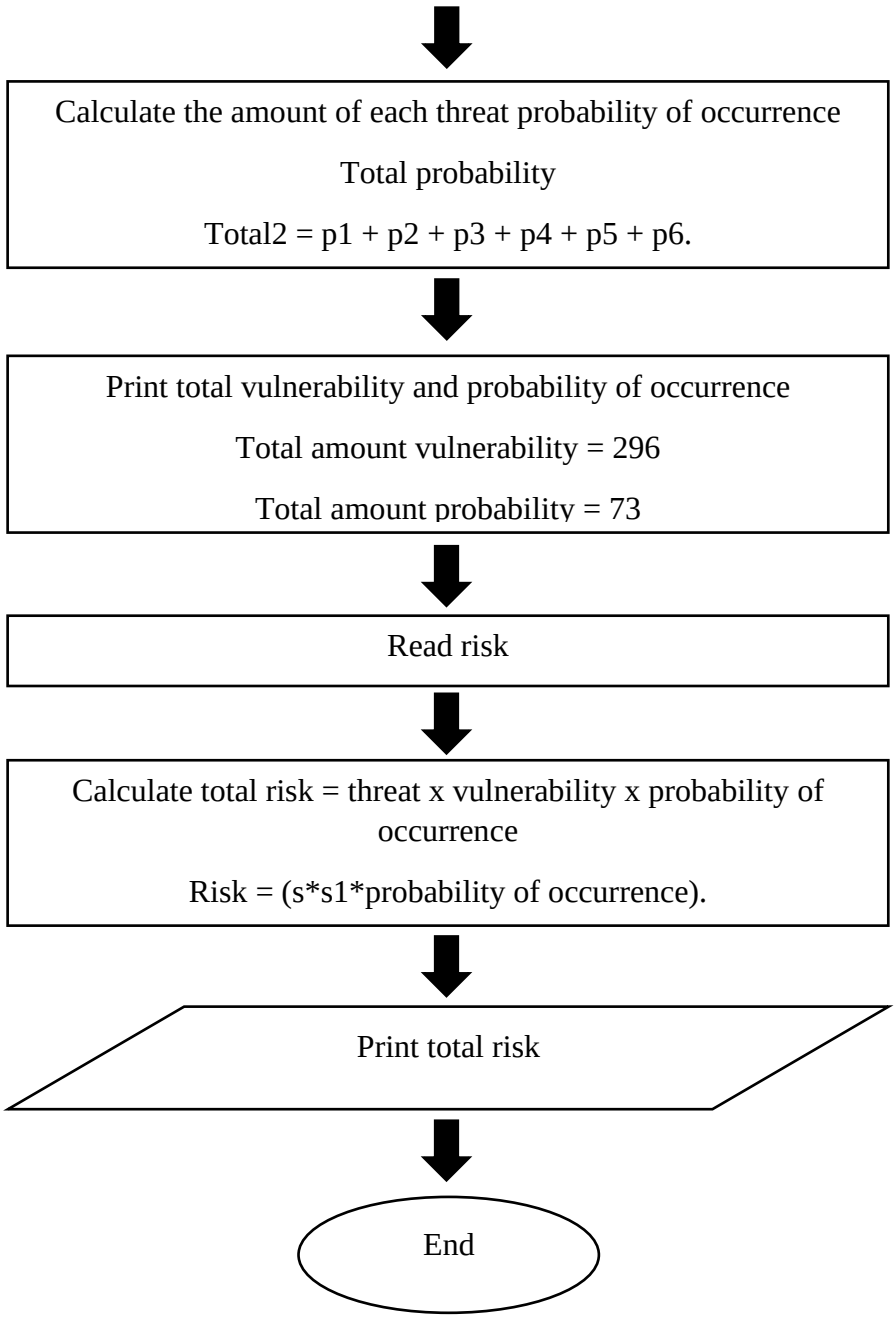
Calculate total risk = threat x vulnerability x probability of occurrence

Print total risk

End

4.8 FLOW CHART




Calculate the amount of each threat probability of occurrence
Total probability
Total2 = p1 + p2 + p3 + p4 + p5 + p6.
Print total vulnerability and probability of occurrence
Total amount vulnerability = 296
Total amount probability = 73
Read risk
Calculate total risk = threat x vulnerability x probability of occurrence
Risk = (s*s1*probability of occurrence).
Print total risk
End

TV

5.0 IDENTIFY 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).

5.1 UNDERSTAND 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.

5.2 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

5.3 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.

5.4 INSTRUCTIONS FOR SELECTED SOLUTIONS

1.The program will display the options of packages (example: Astro primary pack/ Astro entertainment pack/ Astro broadband and Astro platinum pack) and its information (price/discount/ installation bill/gift)

2.Ask users to key in their personal information such as name, age and phone number.

3. Ask the user to key in their package selected.

4. The program will calculate the total payment and display the payment details for a 2-year subscription contract with 2 payment option (deposit and monthly payment or fully payment) to the user.

5.5 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.

5.6 CALCULATION TABLE

TYPE OF PACKAGES	PAYMENT METHOD	FORMULA	TOTAL PAYMENT

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 Ultra box Decoder Set	1.Deposit & Monthly Payment	-Actual price = package price * 24 + installation bill (Actual price= 60.0 *24+ 99.0) -Discount1=0.10 *package price (Discount1=0.10 *60.0) -Price = package price - discount1 + (package price* 23) + installation bill (Price = 60.0 – 6.0 + (60.0* 23) + 99.0) -Deposit = package price - discount1 + installation bill (Deposit = 60.0 – 6.0+ 99.0) -Balance = 23* package price (Balance = 23* 60.0) -Monthly payment= Package price	Actual price = RM1 539.0 Discount1 =RM 6.0 Price =RM 1 533.0 Deposit =RM 153.0 Balance =RM 1 380.0 Monthly payment =RM 60.0
	2.Fully Payment	-Actual price = package price * 24 + installation bill (Actual price= 60.0 *24+ 99.0) -Discount1=0.10 *package price (Discount1=0.10 *60.0) -Discount2 = 0.15* price (Discount2= 0.15 *(60.0 – 6.0 + (60.0* 23) + 99.0) -Total price = Actual price – discount1-discount2 (Total Price= 1 539.0 -6 .0 -229.95)	Actual price = RM1 539.0 Discount1 =RM 6.0 Discount2 =RM 229.95 Total Price =RM 1 303.05
ASTRO ENTERTAINMENT PACK	1.Deposit & Monthly Payment	-Actual price = package price * 24 + installation bill (Actual price= 90.0 *24+ 99.0)	Actual price = RM 2 259.0

*Price = RM 90.00 *Installation fee = RM 99.00 *24 months subscription contract *Up to 105+ Channels *Astro Go accessible *Support HD Channel *Free Ultra box Decoder Set		-Discount1=0.10 *package price (Discount1=0.10 *90.0) -Price = package price - discount1 + (package price* 23) + installation bill (Price = 90.0 – 9.0 + (90.0* 23) + 99.0) -Deposit = package price - discount1 + installation bill (Deposit = 90.0 – 9.0+ 99.0) -Balance = 23* package price (Balance = 23* 90.0) -Monthly payment= Package price	Discount1 =RM 9.0 Price =RM 2 250.0 Deposit =RM 180.0 Balance =RM 2 070.0 Monthly payment =RM 90.0
	2.Fully Payment	-Actual price = package price * 24 + installation bill (Actual price= 90.0 *24+ 99.0) -Discount1=0.10 *package price (Discount1=0.10 *90.0) -Discount2 = 0.15* price (Discount2= 0.15 *(90.0 – 9.0 + (90.0* 23) + 99.0) -Total price = Actual price – discount1-discount2 (Total Price= 2 259.0 -9.0 -337.5)	Actual price = RM 2 259.0 Discount1 =RM 9.0 Discount2 =RM 337.5 Total Price =RM 1 912.5
ASTRO BROADBAND PACK *Price = RM 140.00 *Installation fee = RM 99.00	1.Deposit & Monthly Payment	-Actual price = package price * 24 + installation bill (Actual price= 140.0 *24+ 99.0) -Discount1=0.10 *package price (Discount1=0.10 *140.0) -Price = package price - discount1 + (package price* 23) + installation bill	Actual price = RM 3 459.0 Discount1 =RM 14.0 Price =RM 3 445.0

*24 months subscription contract *Up to 90+ Channels TV and Radio *Unlimited High Speed Internet *Astro Go accessible *Support HD Channel *Free Ultra box Decoder Set, Modem and Router		(Price = 140.0 – 14.0 + (140.0* 23) + 99.0) -Deposit = package price - discount1 + installation bill (Deposit = 140.0 – 14.0+ 99.0) -Balance = 23* package price (Balance = 23* 140.0) -Monthly payment= Package price	Deposit =RM 225.0 Balance =RM 3 220.0 Monthly payment =RM 140.0
	2.Fully Payment	-Actual price = package price * 24 + installation bill (Actual price= 140.0 *24+ 99.0) -Discount1=0.10 *package price (Discount1=0.10 *140.0) -Discount2 = 0.15* price (Discount2= 0.15 *(140.0 – 14.0 + (140.0* 23) + 99.0) -Total price = Actual price – discount1-discount2 (Total Price= 3 459 .0 -14.0 -516.75)	Actual price = RM 3 459.0 Discount1 =RM 14.0 Discount2 =RM 516.75 Total Price =RM 2 928.25
ASTRO PLATINUM PACK *Price = RM 195.00 *Installation fee = RM 99.00 *24 months subscription contract *Up to 145+ Channels	1.Deposit & Monthly Payment	-Actual price = package price * 24 + installation bill (Actual price= 195.0 *24+ 99.0) -Discount1=0.10 *package price (Discount1=0.10 *195.0) -Price = package price - discount1 + (package price* 23) + installation bill (Price = 195.0 – 19.5 + (195.0* 23) + 99.0) -Deposit = package price - discount1 + installation bill	Actual price = RM 4 779.0 Discount1 =RM 19.5 Price =RM 4 759.0 Deposit

*Astro Go accessible *Support UHD/4K Channel *Free Ultra box Decoder Set		(Deposit = 195.0 – 19.5+ 99.0) -Balance = 23* package price (Balance = 23* 195.0) -Monthly payment= Package price	=RM 274.5 Balance =RM 4 485.0 Monthly payment =RM 195.0
	2.Fully Payment	-Actual price = package price * 24 + installation bill (Actual price= 195.0 *24+ 99.0) -Discount1=0.10 *package price (Discount1=0.10 *195.0) -Discount2 = 0.15* price (Discount2= 0.15 *(195.0 – 19.5+ (195.0* 23) + 99.0) -Total price = Actual price – discount1-discount2 (Total Price= 4 779.0 -19.5 -713.925)	Actual price = RM 4 779.0 Discount1 =RM 19.5 Discount2 =RM 713.925 Total Price =RM 4 045.575

5.7 ALGORITHM

1. Programs will display message for greetings the customer

2. Programs will display 4 option of packages and all of the information provided to customers

3. User key in personal information such as name, age and telephone number.

4. User key in the price of the package they interested in.

5. Calculate the formula based on package price key in 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

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

7. Program will display 2 method of payment detail based on the calculation.

5.8 PSEUDOCODE

Start

Input actual price, discount1, discount2, deposit, price, total price, balance, installationbill = 99.00

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”

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”

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”

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”

Input name, age, phone number
Output name, age, phonenum

Output message "Please enter the package you interested in
ENTER 60 for ASTRO PRIMARY PACK
ENTER 90 for ASTRO ENTERTAINMENT PACK
ENTER 140 for ASTRO BROADBAND PACK
ENTER 195 for ASTRO PLATINUM PACK"

Input package price

Calculate actual price = packageprice*24 + installation bill.
Calculate discount1 = 0.10*package price
Calculate deposit = package price- discount1 + installationbill
Calculate balance = package price*23
Calculate price = balance + deposit
Calculate discount2 = 0.15*price
Calculate total price = price- discount2.

Output message "METHOD 1: DEPOSIT AND MONTHLY PAYMENT FOR 2 YEARS SUBCRIPTION CONTRACT"
Output package price, installationbill, actualprice. discount1, price, deposit, balance

Output message “METHOD 2: FULLY PAYMENT FOR 2 YEARS SUBCRIPTION CONTRACT "
Output actual price, discount1, discout2, total price
End

5.9 FLOWCHART