UTM

UNIVERSITI TEKNOLOGI MALAYSIA

(SECJ1013) PROGRAMMING TECHNIQUE I

SEM 1, SESSION 2023/2024

LAB EXERCISE 1

SECTION 03

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INSTRUCTIONS TO THE STUDENTS

- This exercise must be done **individually**.
- Any form of plagiarism is **NOT ALLOWED**. Students who copied other students' assignments will get **ZERO** marks (both parties, students who copied, and students who shared their work).
- Please insert your **name and matric number** as a comment in your solution.

SUBMISSION PROCEDURE

- Please submit this exercise no later than **October 22, 2023, Sunday (17:00 MYT)**.
- Only one file is required for the submission (the file with the extension **.pdf**).
- Submit the assignment via the UTM's e-learning system (https://elearning.utm.my/23241/).
- Note: Draw your flowchart using any appropriate drawing tools such as Microsoft Visio, Lucid chart (https://www.lucidchart.com/pages/examples/flowchart-maker), and draw.io (https://app.diagrams.net/).

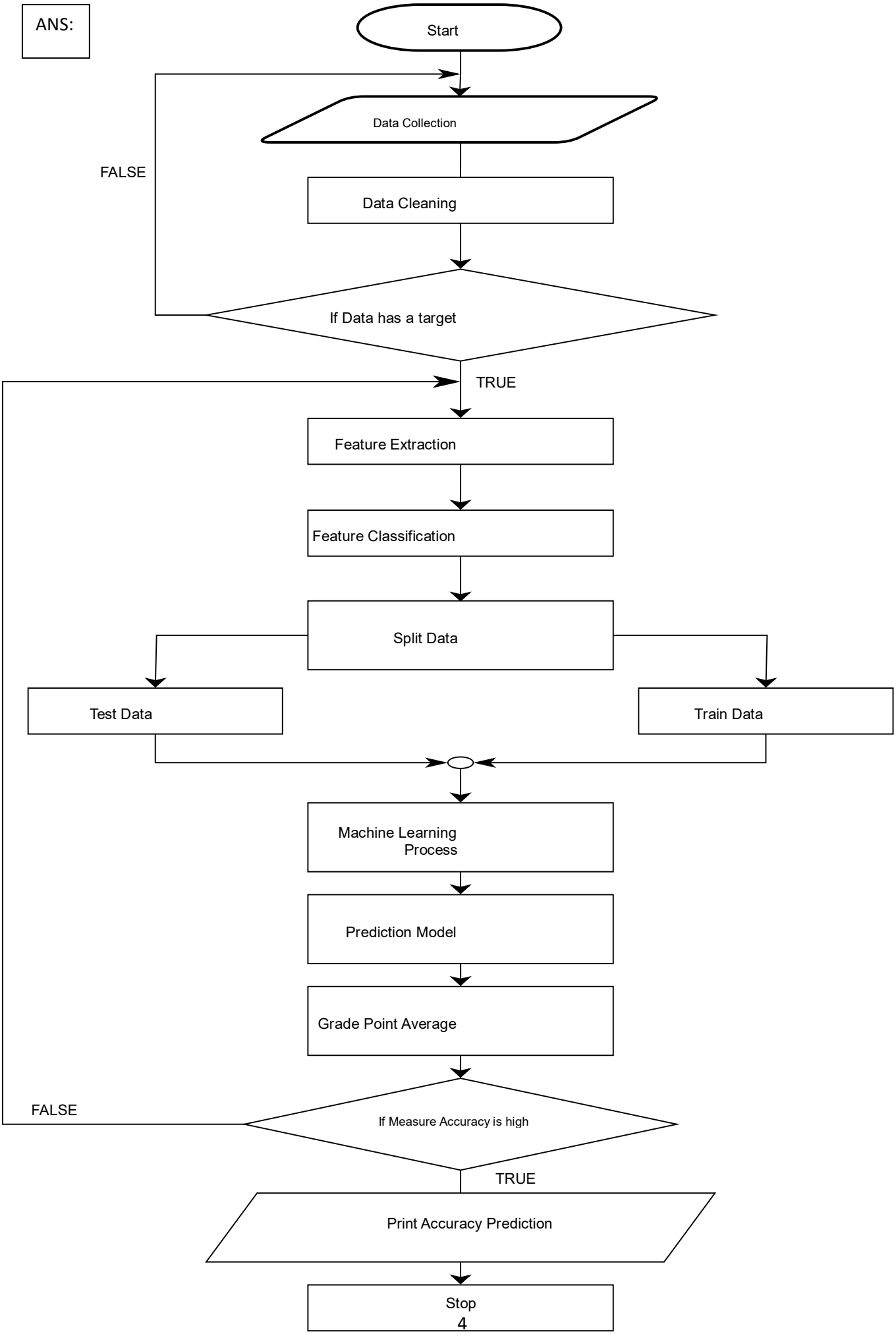
SET 1

Construct a flowchart based on the pseudocode below.

***Hint**: The **bold fonts** show the keywords that need to be included in the flowchart.*

1. **Start**
2. **Data Collection** is to collect data
3. **Data Cleaning** is to prepare the collected data
4. If it **has a target** from the data
   4.1 Yes, go to **Feature Extraction**
   4.2 No, go to Data Collection
5. Feature Extraction is used to extract the specific data used for prediction
6. **Feature Classification** is to classify the data used to predict performance
7. **Split Data** is to split data into 80% training datasets and 20% test datasets
   7.1 **Train Dataset with 20%**
   7.2 **Test Dataset with 80%**
8. **Machine Learning Process** is used for creating a model of machine learning algorithms
9. **Prediction Model** is to create a model for certain purposes
10. Evaluation Model (e.g., **Grade Point Average**) is to evaluate the predicted model
11. During **Measure Accuracy**, if Accuracy is high
    11.1 Yes, go to Display result **Accuracy Prediction**
    11.2 No, go to Feature Extraction
12. **End**

ANS:


Start
Data Collection
FALSE
Data Cleaning
If Data has a target
TRUE
Feature Extraction
Feature Classification
Split Data
Test Data
Train Data
Machine Learning Process
Prediction Model
Grade Point Average
FALSE
If Measure Accuracy is high
TRUE
Print Accuracy Prediction
Stop

SET 2

Construct a pseudocode based on the case study below.

PT1 Hotel offers two rental packages to customers. The following is the rental cost for each package:

Package	Rental Price per Night (RM)
Weekday	150
Weekend/ Public Holiday	250

Customers must pay a deposit of 10% of the rental cost before placing an order. Customers who are regular customers receive a 10% discount. Complete the following pseudocode, which prompts users to enter their name, length of stay, package (1 - Weekday, 2 - Weekend/ Public Holiday), and customer type (Regular or Normal). The pseudocode should calculate and display the customer's name, deposit payment, total discount given (if any), and the remaining rental cost to be paid.

1. Start
2. deposit = 0.10
3. Get the name, duration, package, customer_Type
4. If package==1

4.1 rental=150

5. Else

5.1 rental=250

6. End If
7. If customer_type=Regular

7.1 discount=0.1

8. Else

8.1 discount=0

9. End If
10. price = rental * duration
11. deposit_Payment = deposit * price
12. total_Discount = discount * price
13. balance=price-deposit_Payment-total_Discount
14. Display name, deposit_Payment, total_Discount, balance
15. End

SET 3

Construct a pseudocode that reads an integer number and then calculates the product of its digits. After that, identify whether the product of digits for the integer is a multiple of 4, 5, and/ or 7. ***Hint:*** You should use the operator divide (/) and modulus (%) and also **pre-test loop** to answer this question.

Example 1

Enter an integer number: **9212**

9 * 2 * 1 * 2 = 36

36 is a multiple of 4

Example 2

Enter an integer number: **61145**

6 * 1 * 1 * 4 * 5 = 120

120 is a multiple of 4 and 5

Note: The number in **bold** shows input entered by the user.

```
1. start
2. int n,m
3. get n
4. set int number=n,cnt=0, sum=1
5. while(number!=0)
   5.1 number=number/10
   5.2 cnt=cnt+1
6. end while
7. while n>0
   7.1 m=n%10,   sum=sum*m
   7.2if cnt>1
         7.2.1 print m + "*"
         7.2.2 cnt=cnt-1
   7.3 else if cnt=1
         7.3.1 print m
         7.3.2 cnt=cnt-1
   7.5 n=n/10
   7.6 if(cnt==0)
         7.6.1 print "="+sum
8. end while
9. if((sum%4==0)&&(sum%5==0)&&(sum%7==0))
   9.1 print sum + "is multiple of 4 & 5&7."
       9.1.1    go to step 10
   9.2 else if ((sum%4==0)&&(sum%5==0))
       9.2.1    print sum + "is multiple of 4&5."
       9.2.2    go to step 11
   9.3 else if ((sum%5==0)&&(sum%7==0)
       9.3.1    print sum + "is multiple of 5&7."
       9.3.2    go to step 11
   9.4 9.4else if((sum%4==0)&&(sum%7==0))
       9.4.1    print sum+"is multiple of 4&7."
   9.5 else if(sum%4==0)
       9.5.1    print sum + "is multiple of 4 ."
```

9.5.2 go to step 10

9.6 else if(sum%5==0)

9.6.1 print sum + “is multiple of 5.”

9.6.2 go to step 11

9.7 else if(sum%7==0)

9.7.1 print sum +”is multiple of 7.”

9.8 else

9.8.1 print sum + “is not a multiple of 4 & 5&7.”

10. end if
11. end

SET 4

Construct a flowchart that reads an integer number and then calculates the product of its digits. After that, identify whether the product of digits for the integer is an even or odd number, and a multiple of 3, and/ or 5. ***Hint:*** You should use the operator divide (/) and modulus (%) and also the **post-test loop** to answer this question.

Example 1

Enter integer number: **256**

2 * 5 * 6 = 60

60 is an even number and multiples of 3 and 5

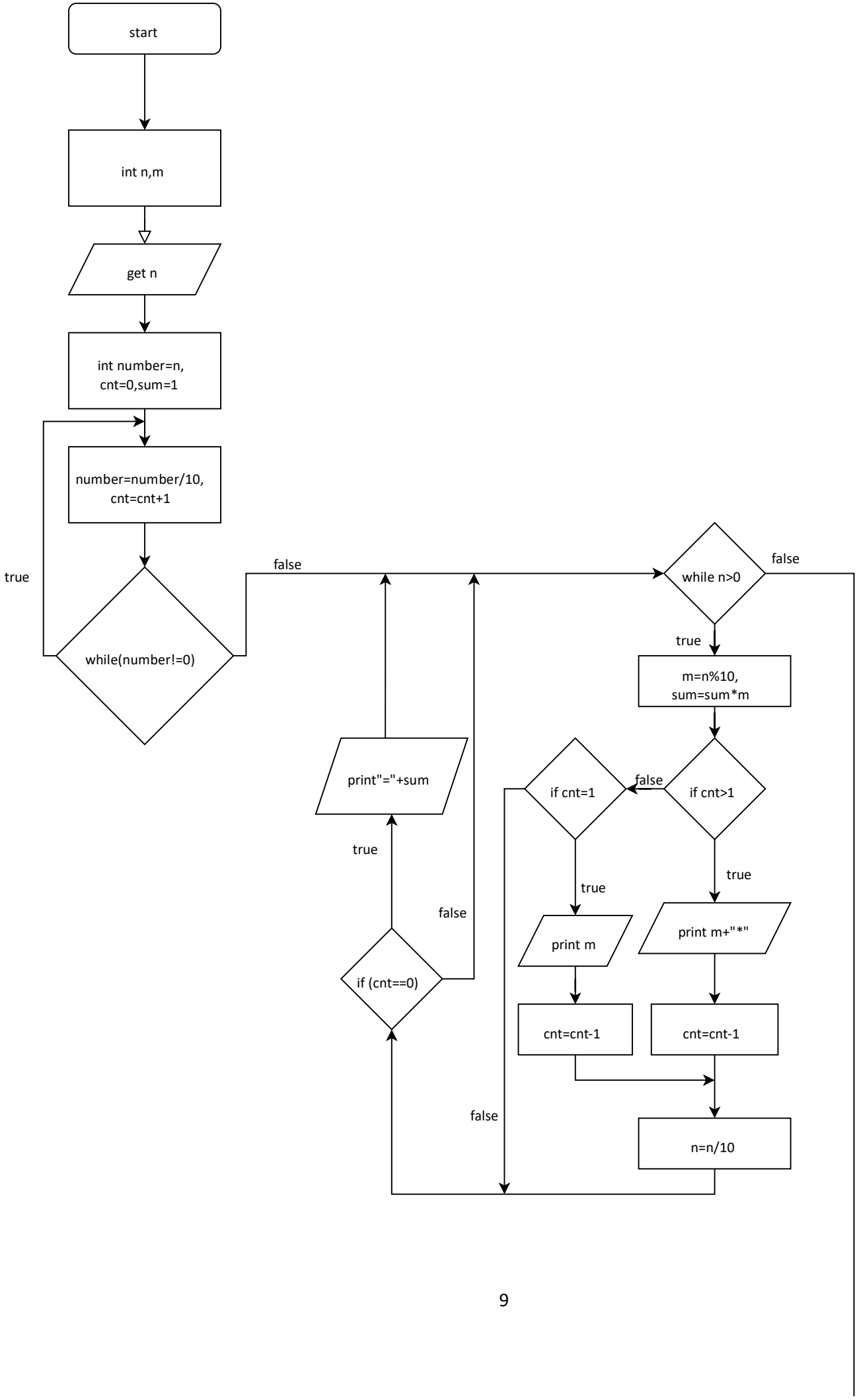
Example 2

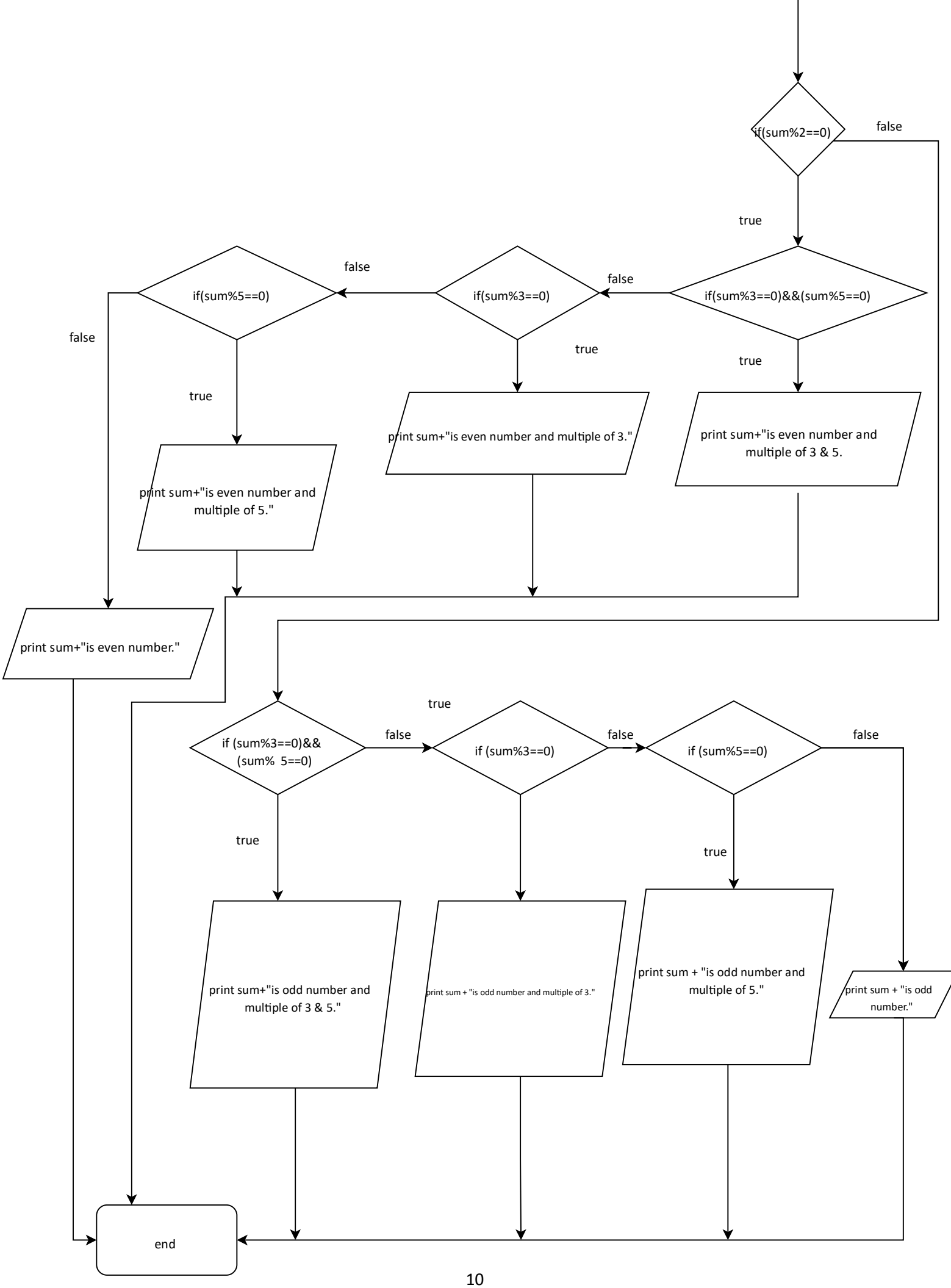
Enter integer number: **7442**

7 * 4 * 4 * 2 = 224

224 is an even number

Note: The number in **bold** shows input entered by the user.


start
int n,m
get n
int number=n,
cnt=0,sum=1
number=number/10,
cnt=cnt+1
true
while(number!=0)
false
while n>0
false
true
m=n%10,
sum=sum*m
if cnt>1
false
if cnt=1
true
print m
true
print m+"*"
cnt=cnt-1
cnt=cnt-1
n=n/10
false
if (cnt==0)
false
true
print"="+sum


if(sum%2==0)
false
true
if(sum%3==0)&&(sum%5==0)
false
if(sum%3==0)
false
if(sum%5==0)
false
true
true
true
print sum+"is even number and multiple of 3 & 5.
print sum+"is even number and multiple of 3."
print sum+"is even number and multiple of 5."
print sum+"is even number."
if (sum%3==0)&& (sum% 5==0)
true
false
if (sum%3==0)
false
if (sum%5==0)
false
true
true
true
print sum+"is odd number and multiple of 3 & 5."
print sum + "is odd number and multiple of 3."
print sum + "is odd number and multiple of 5."
print sum + "is odd number."
end