

CME111 Programming Languages I

Week 6

Examples and Analysis of Algorithms

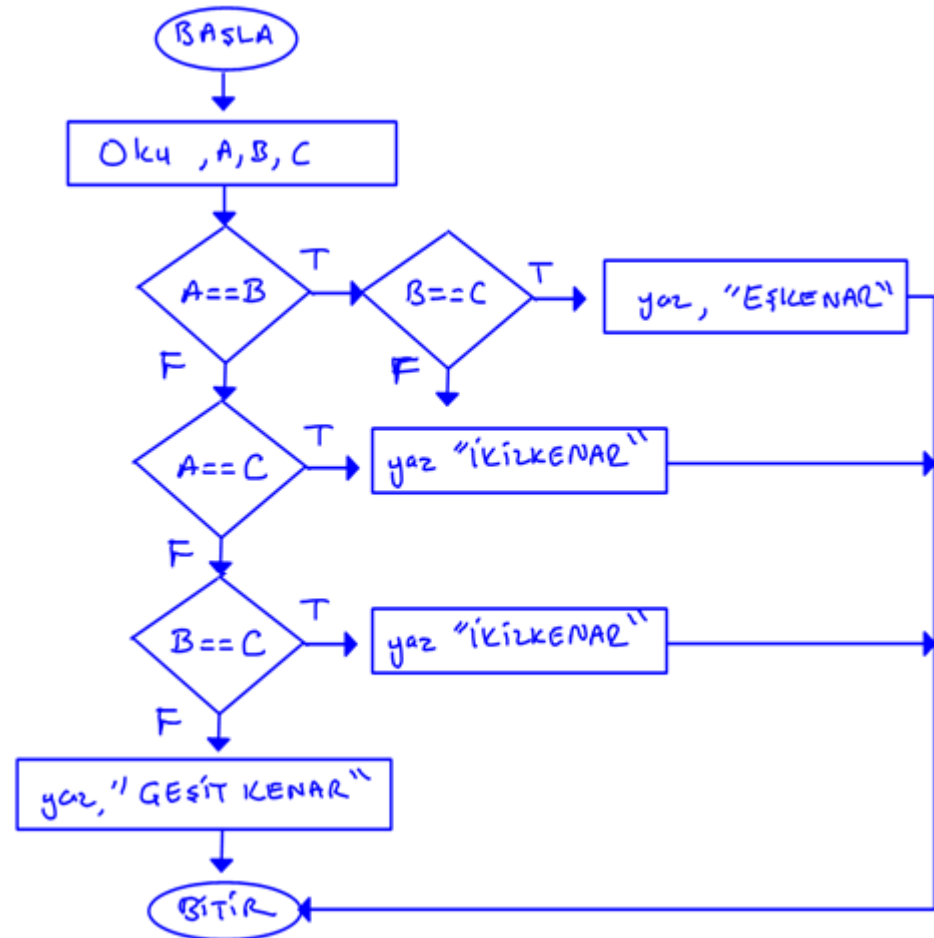
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Example: According to the specified edges of a triangle, find out which varieties

Algorithm

- 1) Start
- 2) Read edges a, b and c.
- 3) If (a = b) and (b = c) Then
Print "equilateral" Go Step 6
- 4) If (a = c) or (b = c) Then
Print "isosceles" Go Step 6
- 5) Else Print "scalene"
- 6) Stop

Flow Chart

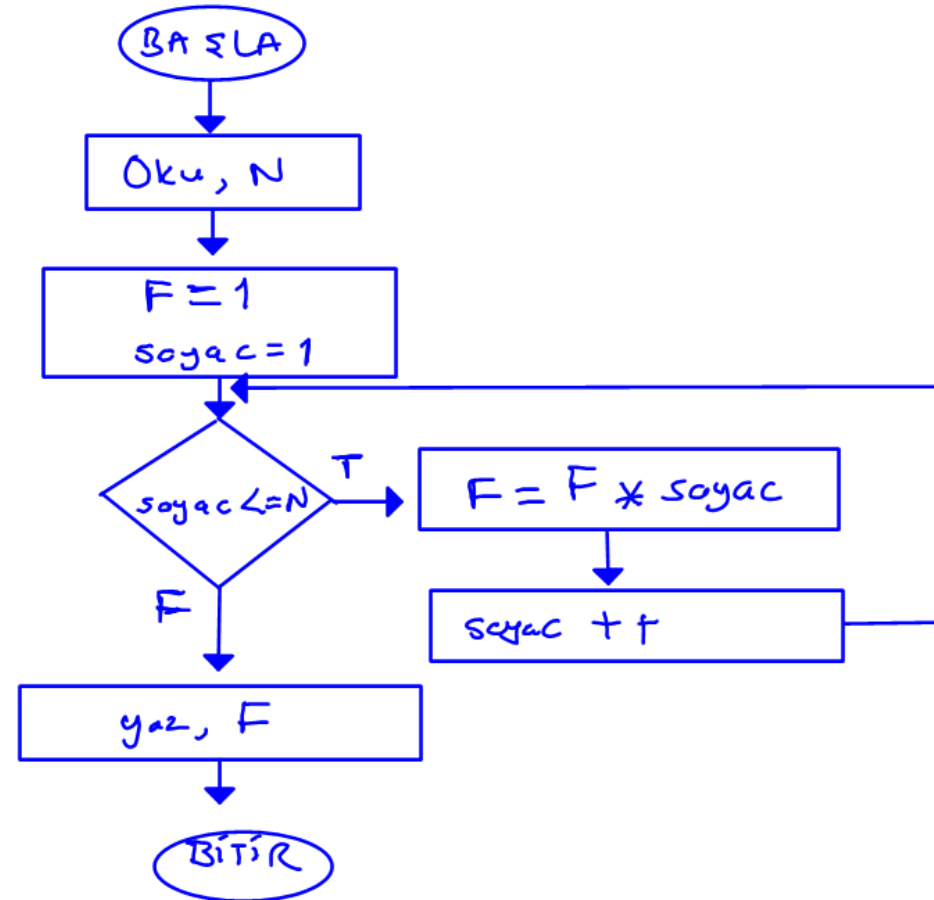


Example: Take the factorial of N number entered from the keyboard

Algorithm

1. Start
2. Read N
3. factorial = 1
4. counter = 1
5. while counter \leq N
 factorial = factorial * counter
 counter ++
6. print, factorial
7. End

Flow Chart

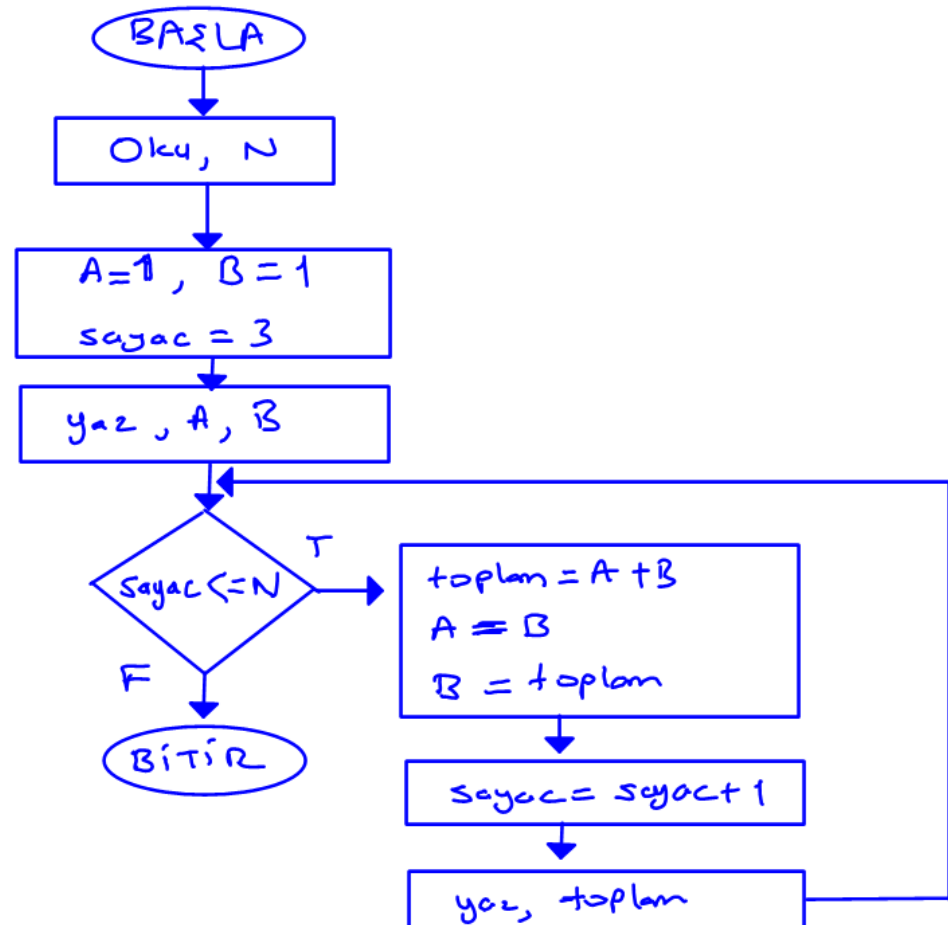


Example: Finding Fibonacci number for the first N terms

Algorithm

1. Start
2. Read N
3. $A=1, B=1$
4. counter=3
5. print, A
6. print, B
7. while counter \leq N
 total = A+B
 print, total
 A=B
 B=total
 counter++
8. End

Flow Chart

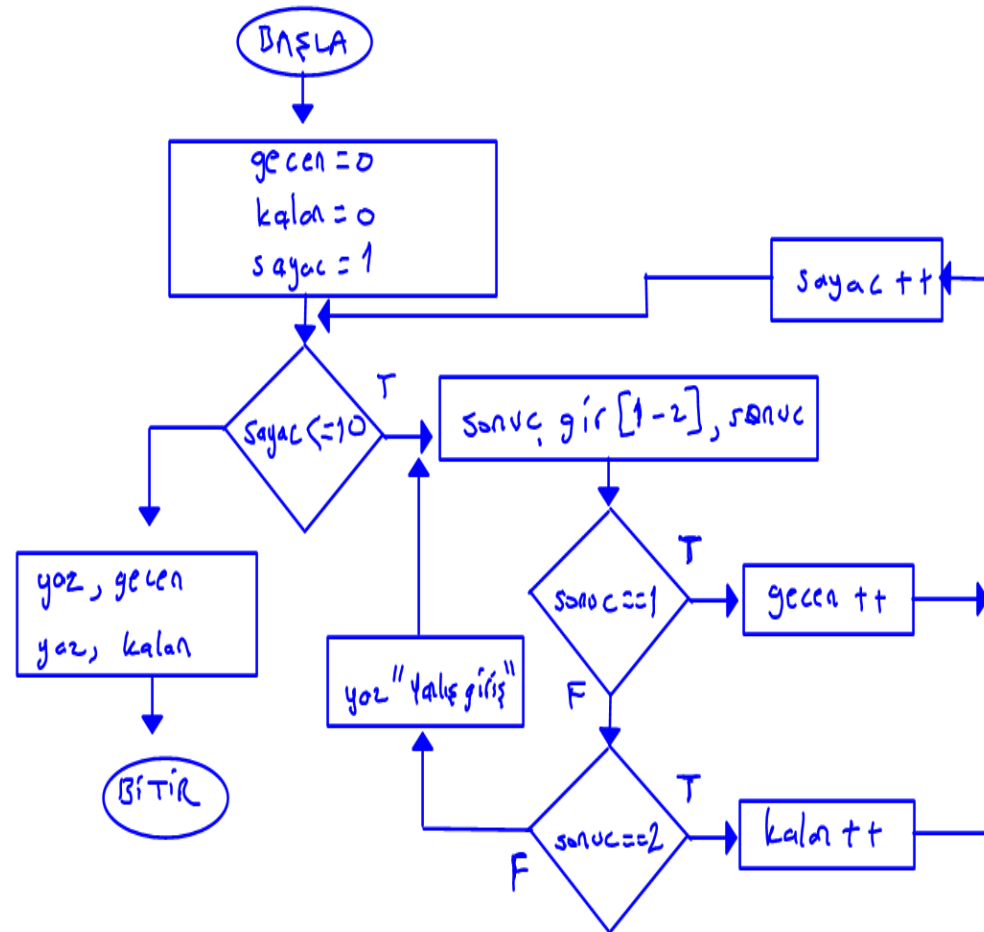


Example

- Test results of 10 students is given from keyboard as 1(passed) or 2(failed).
- Draw flowchart of an algorithm that prints out how many student has passed and how many failed.

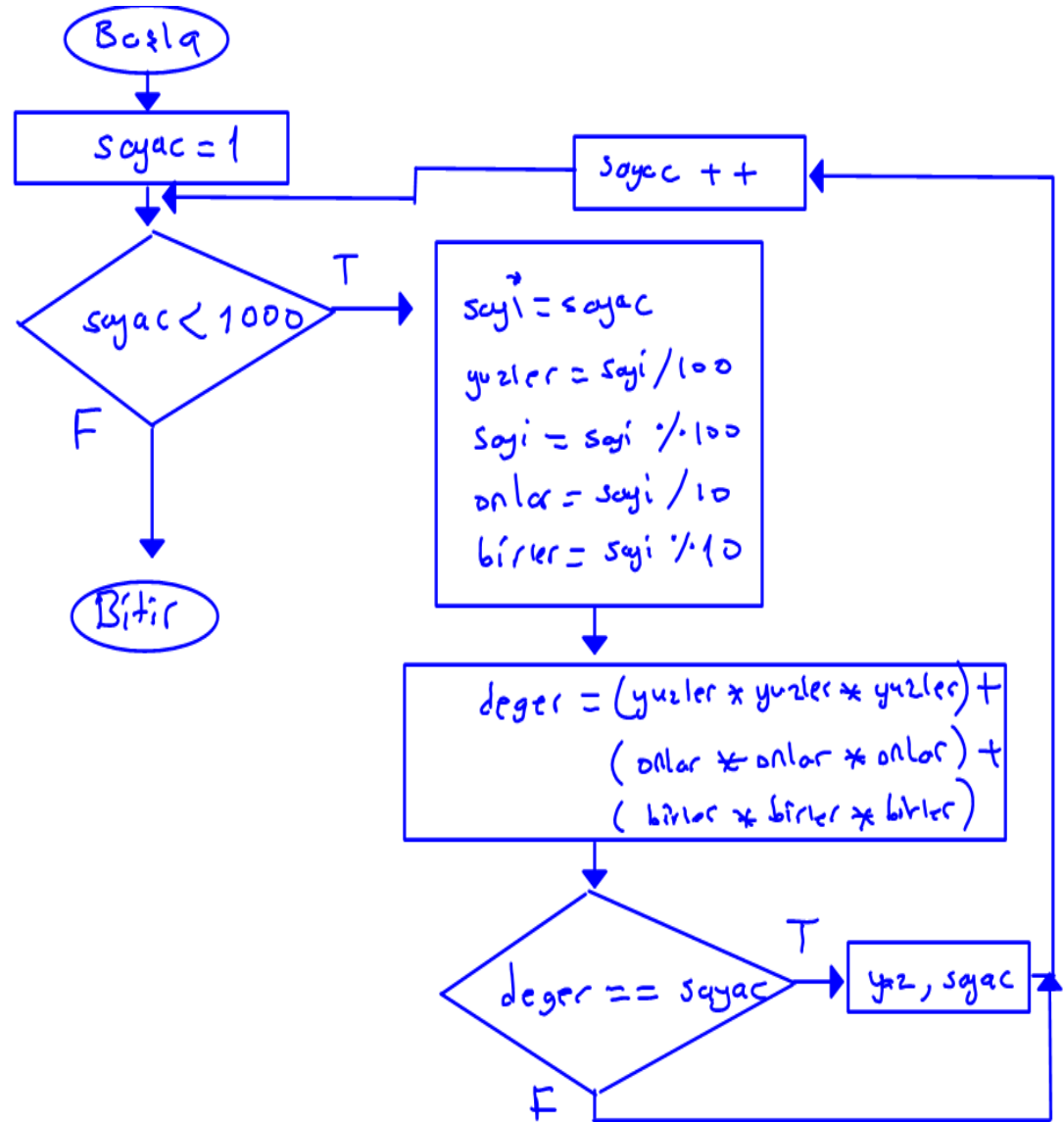
Example

1. *Begin*
2. *passes = 0*
3. *fails=0*
4. *counter = 1*
5. *while counter <=10*
enter result, result
if result == 1
passes++
else if result == 2
fails++
else
print, "invalid result input"
counter++
6. *print, passes*
7. *print, fails*
8. *End*



Example

- Flowchart of a program that prints all 3-digit Armstrong numbers.
- Note: If sum of cubes of digits of a number equals to the number itself, it is called Armstrong number.



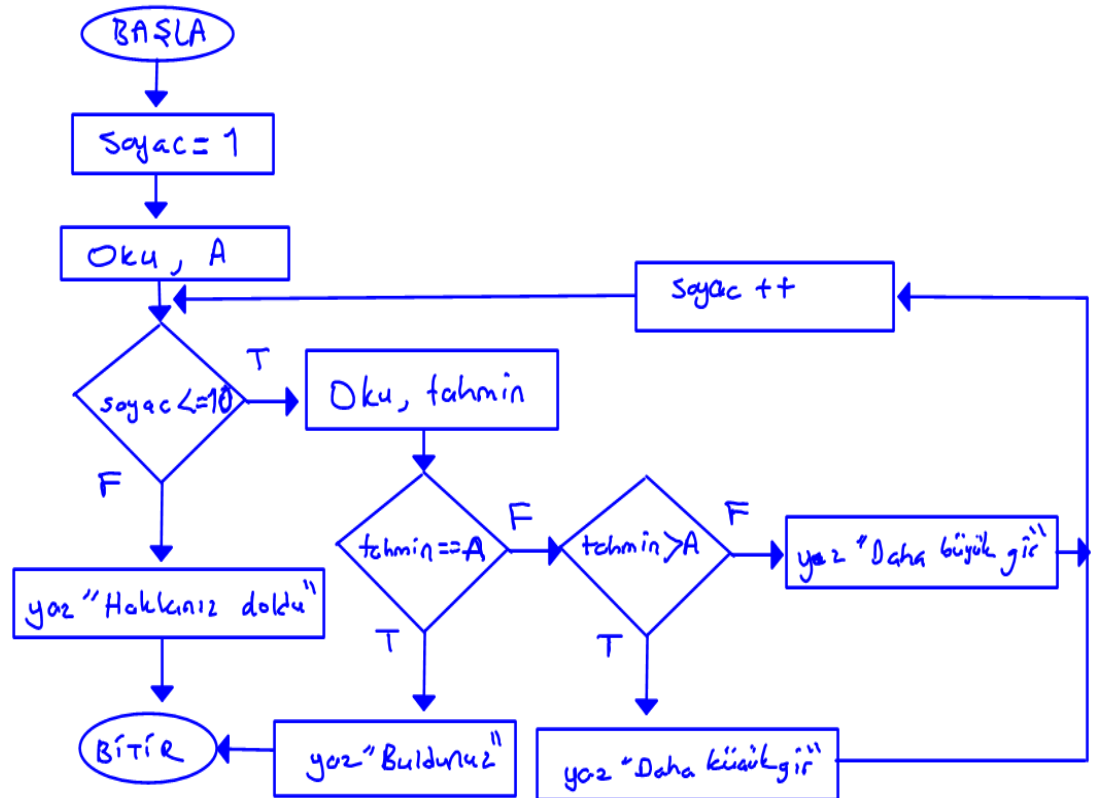
Example: Finding Number

Computer holds a random number between 0-100. Match this number with the input from the keyboard which is user entered.

If number is matched, show message on the screen as "Congratulations, you find in the trial of ...". If number is not matched, show message on the screen as "You can not find the number of ... attempts, try again". If number is not find with 10 attempts show message on the screen as "Sorry, You can not find the number of 10 attempts" and exit. Prepare the algorithm and flow chart of the program. Note: Random number produced with computer between 0-100 is x . The number of attempts of the user is ds . Number entered from user is a .

Example: Finding Number

1. $passes = 0$
2. $fails = 0$
3. $counter = 1$
4. $while\ counter \leq 10$
 enter result, result
 if result == 1
 $passes++$
 else if result == 2
 $fails++$
 else
 print, "invalid
 result input"
 $counter++$
5. print, passes
6. print, fails
7. End



References

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