Last name _____ First name _____ SN _____

A&CP-E1. Program Design. **Do not declare variables for any problem.**

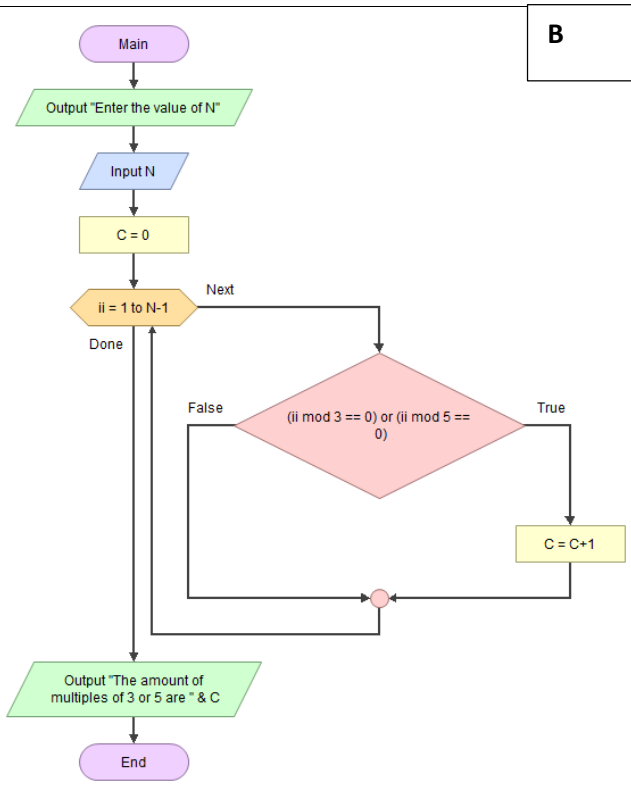
Filename: EX#1- Program Design (feb-14-2019)-V2

P#8.b. Write (✓) if the algorithm is correct, nothing otherwise**.** Starting with one (1), algorithms in pseudocode test for integer numbers less than N and count how many of them are multiple of 3 or 5. **Hint:** Algorithm must not count double, if a number is multiple of 3 and 5, it should be counted only once. The mod or % operator available in flowgorithm is used. Assume not syntax errors.

A

```
INPUT N
SET C=0, i=1
WHILE i<=N-1
  IF (i mod 3 ==0)
        C = C +1
  ELSEIF (i mod 5 ==0)
        C = C +1
  ENDIF
  i=i+1
ENDWHILE
PRINT C
```

B



C

```
INPUT N
SET C=0
FOR i=1 up to N-1, Step 1
  IF (i mod 3 ==0)
     IF (i mod 5 ==0)
        C = C +1
     ENDIF
  ENDIF
ENDFOR
PRINT C
```

D

```
INPUT N
SET C=0

FOR i=1 up to N-1, Step 1
  IF (i mod 3 ==0) or (i mod 5 ==0)
     C = C +1
  ENDIF
ENDFOR

PRINT C
```

E

```
INPUT N
SET C=0

FOR i=1 up to N-1, Step 1
  IF (i mod 3 ==0) and (i mod 5 ==0)
     C = C +1
  ENDIF
ENDFOR

PRINT C
```

P#3.f. Write pseudocode to find the factors of a positive number **N** in a list of numbers entered by the user. Count how many factors are there in the list. For instance, if N=100 and the entered list is x=[5,3,9,7,4,2,11,13,19,1,5,6,10,55,70,8,25,50,99,100], code must find 9 factors, which are: 5, 4, 2, 1, 5, 10, 25, 50, 100. **Hint:** You can use the mod or % operator to compute the remainder of an integer division and a sentinel to stop looping when the list is over

P#10.e. The first few square numbers: 1, 4, 9, 16, 25, 36, 49…

This sequence can be computed as n^2 where n is a natural number 1, 2, 3, 4, … Write pseudocode to compute and print the square number sequence for values of **n** in the range of 1 to 10

n	$Square_n$
1	1
2	4
3	9
4	16
…	…
10	100

P#12.b. In a group of N students (male and female), write pseudocode to compute the percentage of female that pass or fail the course. The passing score is 60 or greater. **Hint:** a variable, say **G** (as in gender) should store one of two possibilities, **'M'** (as in 'male') or **'F'** (as in 'female'), inputted by the user.

"OKAY, HERE'S THE PLAN..."

P#2.b. Write pseudocode to determine if a positive number X entered by the user is **<u>not</u>** prime. Prime numbers are only divisible by 1 and itself. For instance, 5 is prime because it is only divisible exactly by 1 and 5. On the other hand, 8 is not prime because it is divisible by 1, 2, 4, 8. Hint: You can use the mod or % operator to compute the remainder of an integer division. Use a flag variable.