

Assignment 1 [3 marks]

Segmentation of Number and Conversion to English Phrase

Due: **15 Oct. 2021, 23:59** [Week 7]

1. This assignment contains ONE question with **Two** parts. You are required to **submit** a complete C++ program (.cpp only) **for each part** on **PASS** before the deadline.
2. You can submit as many times as you want before the deadline, and we will grade your latest version.
3. Only a small set of the test cases are visible for the testing, and a more comprehensive set of test cases will be used for grading. In other word, passing all the visible test cases does not mean that you can get full mark for this assignment. Try your best to thoroughly test your program. **Hidden test cases will not be released.**
4. The marking of each question is based on the percentage of the total test cases that your solution can pass. **If your submitted solution leads to a compilation error on PASS, zero mark will be given to that question and no manual checking to your solution is provided in such a case.**
5. No late submission will be accepted. ALL submission should be on **PASS**.
6. Plagiarism check will be performed.
7. You only need to use the material from **Lectures 1 to 5**. It is NOT necessary to include any other library, except `<iostream>`.

Part A. [1 mark] Number Segment

Write a program that read a positive integer number (data type: `int`) as input and print the number in segments of 3 digits. For each 3-digit segment, print the least significant digit (LSD) in English word. Do not print the 3-digit segment if it is all 0.

Notes:

1. You may not know the number of digits from the input in advance.
2. The input number will be no greater than `INT_MAX`, i.e., the maximum number that an `int` type variable can represent.
3. We assume the input is valid, i.e., no need to check the correctness of input.

Sample Input and Output

Example 1

```
Please enter an integer number: 2147483647
3-digit Segment(s):
002 Two
147 Seven
483 Three
647 Seven
```

Example 2

```
Please enter an integer number: 1
3-digit Segment(s):
001 One
```

Example 3

```
Please enter an integer number: 10001
3-digit Segment(s):
010 Zero
001 One
```

Example 4

```
Please enter an integer number: 8000003
3-digit Segment(s):
008 Eight
003 Three
```

Example 5

```
Please enter an integer number: 0
```

Part B. [2 marks] Arabic Number To English Phrase

Extend and modify your program for **Part A** to print an input integer in English phrase.

Notes:

1. You may not know the number of digits from the input in advance.
2. The input number will be no greater than `INT_MAX`, i.e., the maximum number that an `int` type variable can represent.
3. We assume the input is valid, i.e., no need to check the correctness of input.
4. Examples

Value	In English Phrase
11	Eleven
123	One Hundred and Twenty Three
1,023	One Thousand and Twenty Three
12,315	Twelve Thousand Three Hundred and Fifteen
589,001	Five Hundred and Eighty Nine Thousand and One
16,000,014	Sixteen Million and Fourteen
1,000,000,000	One Billion

Hints.

- "Hundred" is omitted if its place is zero; "Thousand" is omitted when the thousand segment is zero; "Million" is omitted when the segment is zero.
- Except for the *most significant segment*, "and" should be inserted if either it's 1's or 10's place is *not zero*. (see e.g.1)
- For the *most significant segment*, "and" should be inserted if either it's 1's or 10's place is *not zero when the 100's place is not zero as well*. (see e.g.2)

	million segment			thousand segment			hundred segment			
digit -	d ₈	d ₇	d ₆	d ₅	d ₄	d ₃	d ₂	d ₁	d ₀	
e.g.1	0	2	9	8	7	6	5	4	3	Twenty Nine Million Eight Hundred and Seventy Six Thousand Five Hundred and Forty Three
e.g.2				3	0	1	0	0	0	Three Hundred and One Thousand

Sample Input and Output

Example 1

Please enter an integer number: 2147483647
Two Billion One Hundred and Forty Seven Million Four Hundred and Eighty Three Thousand Six Hundred and Forty Seven

Example 2

Please enter an integer number: 1023
One Thousand and Twenty Three

Example 3

Please enter an integer number: 12315
Twelve Thousand Three Hundred and Fifteen

Example 4

Please enter an integer number: 589001
Five Hundred and Eighty Nine Thousand and One

Example 5

Please enter an integer number: 16000014
Sixteen Million and Fourteen