Lab: Nested Loops

1. Building

Write a function to **print a table**, representing a **building**:

- **Odd floors** hold apartments (**type A**), e.g. **A10, A11, A12**, …
- **Even floors** hold offices (**type O**), e.g. **O20, O21, O22**, …
- The last floor holds large apartments (**type L**), e.g. **L60, L61, L62**
- Identifiers consist of: **{type}{floor}{number}**, e.g. **L65, A12,O24**

Input

- the **count of floors** and the **count of estates per floor**

Output

- the building plan (rectangular table of estates)

Examples

Input	Output
6 4	L60 L61 L62 L63 A50 A51 A52 A53 O40 O41 O42 O43 A30 A31 A32 A33 O20 O21 O22 O23 A10 A11 A12 A13

Input	Output
5 3	L50 L51 L52 O40 O41 O42 A30 A31 A32 O20 O21 O22 A10 A11 A12

2. Stupid Passwords

Write a program, which **generates all possible passwords**, consisting of the following 3 parts:

- The **first** part is an **even** number in the range [**2…n**]
- The **second** digit is an **odd** number in the range [**1…n**]
- The **third** is the **product** of the first two

Explanation

Even	Odd	Product		Password
4	**3**	(4*3) = **12**	---------->	**4312**

Examples

Input	Output
11	212 236 2510 2714 2918 21122 414 4312 4520 4728 4936 41144 616 6318 6530 6742 6954 61166 818 8324 8540 8756 8972 81188 10110 10330 10550 10770 10990 1011110

Input	Output
5	212 236 2510 414 4312 4520

Input	Output
6	212 236 2510 414 4312 4520 616 6318 6530

3. Magic Numbers

Write a function to find all **3-digit magic numbers** of order **n**

- A number is magic of order n if the product of its digits is n

Example

Input	Output
1	111

Input	Output
3	113 131 311

4. Travel Savings

Calculate the **money collection** for multiple travel destinations:

- Read **destination** and **needed budget** for destination
- Read many times amounts of collected money, until they are **enough** for the destination (start from 0)
    - Print "**Collected: {sum}**" or "**Going to {destination}**"
- Read another destination and budget and collect money again
- A destination "**End**" ends the program

Examples

Input	Output
Bali 3500 800 1800 1000 Brazil 4600 5000 End	Collected: 800 Collected: 2600 Collected: 3600 Going to Bali! Collected: 5000 Going to Brazil!

5. Prime Numbers

Write a function to print all **prime numbers in given range**

Examples

Input	Output
5 50	5 7 11 13 17 19 23 29 31 37 41 43 47

Input	Output
20 30	23 29

6. Unique PIN Codes

Write a function to **generate PIN codes** following certain rules

- Receives **3 digits: max1, max2, max3** (each is an upper limit)
  - Generates unique **3-digit PIN codes,** matching the following:
  - Each digit is **within its range**: [1..max1], [1..max2], [1..max3]
  - The **first** and the **third digit** must be **even**
  - The **second digit** must be a **prime number** in the range **[2…7]**
- Prints the PIN codes in increasing order

Example

Input	Output
3 5 5	222 224 232 234 252 254

7. Letters Combinations

Write a function to generate all 3-letter combinations under certain conditions:

- Receives a start letter **s**, end letter **e** and excluded letter **x**
- Prints all **combinations of 3 letters** in the range [**s**…**e**],excluding **x**, and their **count**

Input	Output
a c b	aaa aac aca acc caa cac cca ccc 8

8. Happy Numbers

Write a function to generate all **4-digit happy numbers {d1}{d2}{d3}{d4}** for given integer **n**:

- A number is happy if **d1 + d2 == d3 + d4 == n**

Input	Output
3	1203 1212 1221 1230 2103 2112 2121 2130 3003 3012 3021 3030

Input	Output
4	1304 1313 1322 1331 1340 2204 2213 2222 2231 2240 3104 3113 3122 3131 3140 4004 4013 4022 4031 4040