# Exercises: Files, Directories and Exceptions

Problems for exercises and homework for the [“Python-Fundamentals-Jan-2018” course @ SoftUni](https://softuni.bg/trainings/1855/python-fundamentals-january-2018).

This exercise does **NOT** have a **Judge Contest**. You will have to **test** every problem **locally**.

## Odd Lines

Write a program that reads a text file and writes its every **odd** line in another file. Line numbers starts from 0.

### Examples

|  |  |
| --- | --- |
| **Input.txt** | **Output.txt** |
| Two house holds, both a like in dignity,  In fair Verona, where we lay our scene,  From ancient grudge break to new mutiny,  Where civil blood makes civil hands unclean.  From forth the fatal loins of these two foes  A pair of star-cross'd lovers take their life;  Whose miss adventured piteous overthrows  Do with their death bury their parent's strife. | In fair Verona, where we lay our scene,  Where civil blood makes civil hands unclean.  A pair of star-cross'd lovers take their life;  Do with their death bury their parent's strife. |

## Line Numbers

Write a program that reads a text file and inserts line numbers in front of each of its lines. The result should be written to another text file.

### Examples

|  |  |
| --- | --- |
| **Input.txt** | **Output.txt** |
| Two house holds, both a like in dignity,  In fair Verona, where we lay our scene,  From ancient grudge break to new mutiny,  Where civil blood makes civil hands unclean.  From forth the fatal loins of these two foes  A pair of star-cross'd lovers take their life;  Whose miss adventured piteous overthrows  Do with their death bury their parent's strife. | 1. Two house holds, both a like in dignity,  2. In fair Verona, where we lay our scene,  3. From ancient grudge break to new mutiny,  4. Where civil blood makes civil hands unclean.  5. From forth the fatal loins of these two foes  6. A pair of star-cross'd lovers take their life;  7. Whose miss adventured piteous overthrows  8. Do with their death bury their parent's strife. |

## Merge Files

Write a program that reads the contents of two text files and merges them together into a third one.

### Examples

|  |  |  |
| --- | --- | --- |
| **Input1.txt** | **Input2.txt** | **Output.txt** |
| 1  3  5 | 2  4  6 | 1  2  3  4  5  6 |

## Filter Extensions

You will receive a **folder** called **input**, with various files with custom extensions. You may add or remove the files as you wish, but they are the only way to test your code.

Write a program which accepts a single input line from the Console, holding an extension … like: "txt", "bmp", "rar" etc.

Print the **NAMES AND EXTENSIONS** of all files, which **have** the **given extension**.

### Examples

|  |  |  |
| --- | --- | --- |
| **Input** | **Input Folder** | **Output** |
| txt |  | test.000.001.in.txt  test.000.001.out.txt  test.000.002.in.txt  test.000.002.out.txt |

## HTML Contents

You have been tasked to create a program which represents a Console interface for creating **HTML** **files**.

Every HTML file naturally holds the following elements:

"<!DOCTYPE html>  
 <html>  
 <head>  
 </head>  
 <body>  
 </body>  
 </html>"

You will need to add them at the end in order to form the file.

You will start receiving input lines in the following format:

{tag} {content}

You should **generate** a **string** from **every input line** – like this: <{tag}>{content}</{tag}> …

If the tag is "**title**" you should add the **generated** **string** between the <head> and </head> tags with a **tabulation** ("\t") **before** it.   
If you receive the "**title**" tag **MORE** than **ONCE**, you should **CHANGE** its **value**.  
In **any other case** you should **APPEND** the **generated string** between the <body> and </body> tags with a **tabulation** ("\t") **before** it.

When you receive the command "**exit**" the input ends. The **content** you have **generated** should be **stored** in a file called "index.html" (**.html** **extension**).

### Examples

|  |  |  |
| --- | --- | --- |
| **Input** | **Output** | **index.html** |
| h1 Heading  h2 Heading  h3 Heading  h4 Heading  h5 Heading  h6 Heading  title Test  p 1.Paragraph  p 2.ParagraphTwo  div SimpleDiv  title HTML-Contents  exit | <!DOCTYPE html>  <html>  <head>  <title>HTML-Contents</title>  </head>  <body>  <h1>Heading</h1>  <h2>Heading</h2>  <h3>Heading</h3>  <h4>Heading</h4>  <h5>Heading</h5>  <h6>Heading</h6>  <p>1.Paragraph</p>  <p>2.ParagraphTwo</p>  <div>SimpleDiv</div>  </body>  </html> |  |

## User Database

You have been tasked to create a database for several users, using … Text files.

The client will give you several input commands. There are two main commands:

* register {username} {password} {confirmPassword}
* login {username} {password}
* logout

If you receive the **register** **command**, you must **store** the **user** in your **database** of **users**, with the **given password**.

* If there is already a **user** with the **given username**, you must print "The given username already exists.", and **ignore** the command.
* If the password and confirmPassword, do **NOT** match, print on the console "The two passwords must match.", and **ignore** the command.

If you receive the **login** **command**, you must **log in** the **user** with the **given** **username** and **password**.

* If there is already a logged in user, you must print "There is already a logged in user.", and **ignore** the command.
* If there is **NO user**, with the **given username** you must print "There is no user with the given username.", and **ignore** the command.
* If the **password** is does **NOT match** the **one** with which the **user** was **registered**, you must print "The password you entered is incorrect.", and **ignore** the command.

If you receive the **logout command**, you must **logout** the, **currently logged in**, **user**.

* If there is **NO** **currently** **logged** **in** **user**, you must print "There is no currently logged in user.", and **ignore** the command.

When you receive the command "**exit**", the input sequence ends. You must **store** the **current database** of **REGISTERED** users, in a **file** called "**users.txt**". The way you store them is up to you. You must load it, every time the program is **ran**.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| register Simo 123 123  register Ivo 123 132  login Simo 132  login Simo 123  logout Simo  register pesho pesho pesho  login Ivo 123  login pesho pesho  exit | The two passwords must match.  The password you entered is incorrect.  There is no user with the given username. |

The **second** **example test**, **DEPENDS** on the **first one**. Run the first one, **save** the **resulting database** from it, and then run the **second one**, in **order** to get **correct results**.

|  |  |
| --- | --- |
| **Input** | **Output** |
| register Merry 123456 123456  register pesho pesho pesho  logout stan  login Simo 123  logout Simo  exit | The given username already exists.  stan is not currently logged in. |

## Folder Size

You are given a folder named "TestFolder". Get the size of all files in the folder, which are **NOT directories.** The result should be written to another text file in **Megabytes**.

### Examples

|  |
| --- |
| **Output.txt** |
| 5.161738395690918 |

## Re-Directory

You have been tasked to distribute a directory (folder) of files with various extensions to different folders. The files should be distributed by their file extension.

You need to **group** **all** **the files**, which have the **same extension**, into a **folder** **named**: "{extension} + s"

In other words: all ".txt" files must be put in a folder called "txts".

The resulting folders should be put in a folder "output".

### Examples

|  |  |
| --- | --- |
| **Input Folder** | **Output Folder** |
|  |  |

## Products

You have been tasked to create a **File Database** for several **stocked products** at a universal shop.

A product has a **Type** (**string**), **Name** (**string**), **Price** (**decimal**) and **Quantity** (**integer**).

The **type** of the product can be – "**Food**", "**Electronics**", "**Domestics**".  
The **name** of the product may consist of **any ASCII character**, except **space**.  
The **price** of the product will be a **floating-point number** with up to **20 digits** after the **decimal point**.  
The **quantity** of the product will be an **integer** in **range [0, 1000]**.

The software program you must build should be a **Console interface**. You will receive **several input lines**, containing **information** about **products**, in the following format:

{name} {type} {price} {quantity}

You should **store** **every product**, with its **respective properties**.

If you receive a **product NAME**, which already **exists** **AND** has the **SAME TYPE**, you should **REPLACE** its **price** and **quantity**, with the **given ones**.

The products are stored **virtually**, in your program’s memory – they are called **ACTIVE products**.

When you receive the **command** "stock", in the **input**, you must **stock all products**, you have, in a **file**.

When you receive the **command** "analyze", in the **input**, you must **print all** **STOCKED** products, in **alphabetical order**, by their **TYPE**, each printed in the following format:

"{type}, Product: {name}

Price: ${price}, Amount Left: {quantity}"

In case there are **NO products** print "No products stocked".

When you receive the command "sales", in the **input**, you must **print all types** of **ACTIVE products**, and the **income**, **earned** if **all** **products** and their **quantities** from that **TYPE** are **sold**. In other words, you need to calculate for **every product** from the **respective type**, its quantity \* price. You must then **sum all sums**, from the products – that’s the **INCOME**.

The output should be formatted like this:

"{firstType}: ${income}

{secondType}: ${income}

{thirdType}: ${income}"

The **types** must be **ordered** in **descending order**, by their **total income**. If one of the types, has **NO products**, **DO NOT PRINT IT**.

**ALL PRICES**, must be **FORMATTED** to the **second digit**, after the **decimal point**.

The input ends when you receive the command "exit". You do **NOT print anything**, you do **NOT store anything on files**. . .   
You **just exit the** **program**.

### Note

You **only** **STOCK** products in the **external FILE**, when you receive the command "stock". Do **NOT** stock products at the **end** of the **program execution**.

When you start the program, you should check if you have any stocked products, and if you do, you should **load** them into your **database**.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| SamsungSmartTV Electronics 4000.50 10  Banana Food 1.50 10000  IPhone7 Electronics 1000 100  Apple Food 1 100000  Microwave Electronics 149.99 2500  Toster Electronics 20.00 15730  sales  Mopper Domestics 10.05 10000  ToiletPaper Domestics 5.50 100000  analyze  sales  stock  exit | Electronics: $829580.00  Food: $115000.00  No products stocked  Electronics: $829580.00  Domestics: $650500.00  Food: $115000.00 |

The **second** **example test**, **DEPENDS** on the **first one**. Run the first one and then run the **second one**, in **order** to get **correct results**.

|  |  |
| --- | --- |
| **Input** | **Output** |
| analyze  sales  Banana Electronics 1000 50  Banana Food 2.09 1000000  ToshibaLaptop Electronics 1500 10  LenovoLaptop Electronics 1999.99 100  AcerLaptop Electronics 1394.49 1000  sales  stock  analyze  exit | Domestics, Product: Mopper  Price: $10.05, Amount Left: 10000  Domestics, Product: ToiletPaper  Price: $5.50, Amount Left: 100000  Electronics, Product: SamsungSmartTV  Price: $4000.50, Amount Left: 10  Electronics, Product: IPhone7  Price: $1000, Amount Left: 100  Electronics, Product: Microwave  Price: $149.99, Amount Left: 2500  Electronics, Product: Toster  Price: $20.00, Amount Left: 15730  Food, Product: Banana  Price: $1.50, Amount Left: 10000  Food, Product: Apple  Price: $1, Amount Left: 100000  Electronics: $829580.00  Domestics: $650500.00  Food: $115000.00  Electronics: $2489069.00  Food: $2190000.00  Domestics: $650500.00  Domestics, Product: Mopper  Price: $10.05, Amount Left: 10000  Domestics, Product: ToiletPaper  Price: $5.50, Amount Left: 100000  Electronics, Product: SamsungSmartTV  Price: $4000.50, Amount Left: 10  Electronics, Product: IPhone7  Price: $1000, Amount Left: 100  Electronics, Product: Microwave  Price: $149.99, Amount Left: 2500  Electronics, Product: Toster  Price: $20.00, Amount Left: 15730  Electronics, Product: Banana  Price: $1000, Amount Left: 50  Electronics, Product: ToshibaLaptop  Price: $1500, Amount Left: 10  Electronics, Product: LenovoLaptop  Price: $1999.99, Amount Left: 100  Electronics, Product: AcerLaptop  Price: $1394.49, Amount Left: 1000  Food, Product: Banana  Price: $2.09, Amount Left: 1000000  Food, Product: Apple  Price: $1, Amount Left: 100000 |

### Note

Use [diffchecker.com](https://www.diffchecker.com/), to **test** your **output** and the **correct output** of the **tests**, since they are **quite big**.