# Exercises: Files, Directories and Exceptions

Problems for exercises and homework for the [“Programming Fundamentals Extended” course @ SoftUni](https://softuni.bg/courses/programming-fundamentals).

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

## 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** 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  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  login Simo 123  logout  exit | The given username already exists.  There is no currently logged in user. |

## 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**.