

IF100 – Spring 2020-2021
Take-Home Exam 1
Due April 2nd, 2021, Friday, 23:59 (Sharp Deadline)

Introduction

The aim of this take-home exam is to practice on the basics of programming. You will write a Python program to get some inputs from the user, do some arithmetic operations and display the result to the user as the output.

Description

Let's assume that you want to share a file with your friend but you don't know how much time that the sharing process will take. So, you need to calculate the total duration using your and your friend's internet speed. That's why you decide to write a Python program that will take (as input) the size of the file you want to share in gigabytes, your upload speed in megabit per second, and your friend's download speed in megabit per second. By using the information gathered from the user, your program should calculate and display the total duration of the file sharing process.

Here are some details:

- You will compress the file before uploading to the file sharing platform.
- File compression speed is 1 megabytes per second.
- After compression, file size will be reduced by 62 percent (i.e. 10 gigabytes becomes 3.8 gigabytes after the compression process).
- Your friend will decompress the file after downloading.
- File decompression speed is 1.2 megabytes per second.

File sharing starts with compressing the file. After that, the compressed version will be uploaded to the file sharing platform. When the compressed file is uploaded, your friend will immediately download it. Finally, your friend will decompress the file and the overall process will terminate. Your program should calculate the time needed for this entire process, i.e. elapsed time between the beginning of the compression and the end of decompression.

Inputs

The program that you will develop needs to take a total of 3 inputs from the user:

1. Size of the file you want to share in gigabytes,
2. Your upload speed in megabit per second,
3. Your friend's download speed in megabit per second.

You may assume that the user will always enter positive numeric values for all of these inputs. To be more precise, all of the inputs will be of type a real number (float).

Here are some information for the conversions:

- 1 GB is 1024 MB.
- 1 MB is 8 Mbit.

Output

Your program needs to calculate and display the total duration of the file sharing process. The output of your program should be exactly in the following format:

File sharing will take h hour(s), m minutes and s second(s).

Your program should calculate three numbers (h, m and s) for its output. If one of these results is 0, your program should also print that.

Please note that *h* and *m* values must be displayed as integers (without any precision), and the *s* value must be displayed as a real number with exactly two decimal places (*Hint*: use **format** function that was explained in the recitation materials).

You may check the "Sample Runs" section given below for some examples.

Sample Runs

Below, we provide some sample runs of the program that you will develop. The *italic* and **bold** phrases are inputs taken from the user. You have to display the required information in the same order and with the same words and characters as below.

Sample Run 1

Please enter the file size you want to share in GB: *10.34*
Please enter your upload speed in Mbps: *4.6*
Please enter your friends download speed in Mbps: *54.7*
File sharing will take 5 hour(s), 58 minute(s) and 46.92 second(s).

Sample Run 2

Please enter the file size you want to share in GB: *10*
Please enter your upload speed in Mbps: *3*
Please enter your friends download speed in Mbps: *10*
File sharing will take 7 hour(s), 29 minute(s) and 32.16 second(s).

Sample Run 3

Please enter the file size you want to share in GB: *0.5*
Please enter your upload speed in Mbps: *4.8*
Please enter your friends download speed in Mbps: *81.2*
File sharing will take 0 hour(s), 16 minute(s) and 57.57 second(s).

Sample Run 4

Please enter the file size you want to share in GB: *0.03*
Please enter your upload speed in Mbps: *30*
Please enter your friends download speed in Mbps: *130*
File sharing will take 0 hour(s), 0 minute(s) and 44.28 second(s).

Sample Run 5

Please enter the file size you want to share in GB: *9.24*
Please enter your upload speed in Mbps: *4.35*
Please enter your friends download speed in Mbps: *50*
File sharing will take 5 hour(s), 27 minute(s) and 25.62 second(s).

How to get help?

You can use GradeChecker (<https://learnt.sabanciuniv.edu/GradeChecker/>) to check your expected grade. Just a reminder, you will see a character ¶ which refers to a newline in your expected output.

What and where to submit?

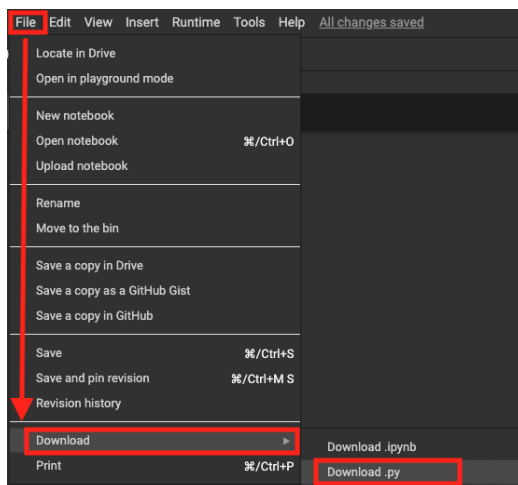
You should prepare (or at least test) your program using Python 3.x.x. We will use Python 3.x.x while testing your take-home exam.

It'd be a good idea to write your name and lastname in the program (as a comment line of course). Do not use any Turkish characters anywhere in your code (not even in comment parts). If your name and last name is "İnanç Arın", and if you want to write it as comment; then you must type it as follows:

```
# Inanc Arin
```

Submission guidelines are below. Since the grading process will be automatic, students are expected to strictly follow these guidelines. If you do not follow these guidelines, your grade will be 0.

- Download your code as *py* file with "File" -> "Download .py" as below:



- Name your *py* file that contains your program as follows:

"username_the1.py"

For example: if your SUCourse+ username is "**duygukaltop**", then the name of the *py* file should be: **duygukaltop_the1.py** (please only use

lowercase letters).

- Please make sure that this file is the latest version of your take-home exam program.
- Submit your work **through SUCourse+ only**! You can use the GradeChecker only to see if your program can produce the correct outputs both in the correct order and in the correct format. It will not be considered as the official submission. You must submit your work to SUCourse+.
- If you would like to resubmit your work, you should first remove the existing file(s). This step is very important. If you do not delete the old file(s), we will receive both files and the old one may be graded.

General Take-Home Exam Rules

- Successful submission is one of the requirements of the take-home exam. If, for some reason, you cannot successfully submit your take-home exam and we cannot grade it, your grade will be 0.
- There is NO late submission. You need to submit your take-home exam before the deadline. Please be careful that SUCourse+ time and your computer time may have 1-2 minutes differences. You need to take this time difference into consideration.
- Do NOT submit your take-home exam via email or in hardcopy! SUCourse+ is the only way that you can submit your take-home exam.
- If your code does not work because of a syntax error, then we cannot grade it; and thus, your grade will be 0.
- Please do submit your **own** work only. It is really easy to find "similar" programs!
- Plagiarism will not be tolerated. Please check our plagiarism policy given in the syllabus of the course.

Good luck!
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& IF100 Instructors