Programming Project 08

Update 3/26: Test 2 and get_data by column were updated. **Update 3/21:** a number of suggestions were added.

This assignment is worth 55 points (5.5% of the course grade) and must be **completed and turned in before 11:59 on Monday, March, 30th**

Assignment Overview

- Dictionaries and Lists
- File manipulation

Assignment Background

Video games have become an outlet for artists to express their creative ideas and imaginations and a great source of entertainment for people who seek a fun and accessible ways to immerse in unique worlds while also share and interact with others. This project will print video game sales data for various platforms across the years. From the old school consoles like Atari 2600 and Sega Genesis to more modern ones like the Xbox One and PlayStation 4.

Project Specifications
You must implement the following functions:

`open_file ()` → `file pointer:`

a. This function repeatedly prompts the user for a filename until the file is opened successfully. An error message should be shown if the file cannot be opened. It returns a file pointer. Use `try-except` and `FileNotFoundError` to determine if the file can be opened. Use the `'utf-8'` encoding to open the file.

```
fp = open(filename, encoding ='utf-8')
```

b. Parameters: none
c. Returns : file pointer

`read_file (fp)` → `D1,D2,D3:`

a) This function read a file pointer and returns 3 dictionaries:
   - Parameters: `file pointer (fp)`
   - Returns : `3 dictionaries of list of tuples`
   - The function displays nothing

b) You must use the `csv.reader` because some fields have commas in them.

c) Each row of the file contains the name of a video game, the platform which it was released, the release year, the genre (i.e. shooter, puzzle, rpg, fighter, etc.), the publishing company, and regional sales across north America, Europe, Japan, and other regions. For this project, we are only interested in the following columns:

```
name = line[0]
platform = line[1]
year = int(line[2])
genre = line[3]
publisher = line[4]
na_sales = float(line[5])
europe_sales = float(line[6])
japan_sales = float(line[7])
other_sales = float(line[8])
```

d) **All strings should be converted to lower case and stripped of the trailing/forward white spaces.**

e) **Multiply each regional sales column by 1,000,000.** The program must compute the total global sales by adding all the regional sales (`na_sales`, `europe_sales`, `japan_sales`, `other_sales`).

f) This function returns 3 separate dictionaries. The first dictionary, with 'name' as key, will contain the data used to display the global sales per year or platform. The second dictionary, with 'genre' as key, contains the data used to display the regional sales per genre. The third dictionary, with 'publisher' as key, contains the data used to display the global sales by publisher. All of 3 dictionaries have a list of tuples as values:

```
D1 = { name:[(name, platform, year, genre, publisher,
      global_sales), …], …}
D2 = { genre: [(genre, year, na_sales, eur_sales,
      jpn_sales, other_sales, global_sales), …], …}
D3 = {publisher: [(publisher, name, year, na_sales,
      eur_sales, jpn_sales, other_sales, global_sales),
      …], …}
```

You should ignore all the values that are not valid:
- 'year' should be integer (`int`)
- All regional sales should be floats (`floats`).

g) Once the file is read and all the data is stored in the 3 dictionaries, you need to sort each dictionary alphabetically in ascending order by their keys. The values for the 3 dictionaries should also be sorted by the last element of the tuples in reverse order (`global_sales`).

Hint: Dictionaries are insertion sorted meaning the order of insertion into the dictionary is preserved. You should first get all the keys of a dictionary and sort them. Then iterate through the sorted list of keys and insert their corresponding values into a new dictionary. You should sort the values before inserting them.

`get_data_by_column(D1, indicator, c_value)` → `List of tuples:`

a) This function iterates through the dictionary D1 and return a subset of the data as indicated in (b) below.
- Parameters: `Dictionary (D1), indicator (str), c_value (str or int)`
- Returns : `List of tuples`
- The function displays nothing

b) The `indicator` parameter is a string with two values: `'year'` or `'platform'`. If indicator equals to `'year'`, append all tuples whose value at the year column is equal to `c_value` into the new list. Sort the new list by global sales (`global_sales`) in descending order and then by the platform alphabetically.
If indicator equals to `'platform'`, append all tuples whose value at the platform column is equal to `c_value` into the new list. Sort the new list by global sales (`global_sales`) in descending order and then by the year in ascending order.

c) If the `c_value` does not exist in the data, the function should return an empty list.

`get_publisher_data(D3, publisher)` → `List of tuples:`

a) This function iterates through the dictionary D3 (which contains the publisher data with publisher as the D3 key). It will return a list of all tuples where the publisher key equals the `publisher` parameter.
- Parameters: `Dictionary (D3), publisher (str)`
- Returns : `List of tuples`
- The function displays nothing

b) The list should be sorted by `name` alphabetically and by global sales (`global_sales`) in descending order. Since the sorted function and the sort method are stable sorts, you can first sort the `names` of the games alphabetically, and then sort them by global sales (with `reverse=True`). (You do the two sorts in that order because you do the primary key last, `global_sales` is the primary key in this case.) By default, sorting is done on the first item in a list or tuple. To sort on other items use `itemgetter` from the `operator` module.

display_global_sales_data(L1, indicator)

a) This function prints a table of all the global game sales stored in `L1` by either all platforms in a single year or all years for a single platform. This function does not return anything.
   - Parameters: `List of tuples(L1), indicator (str)`
   - Returns: `nothing`

b) The list of tuples (`L1`) is the list returned from the `get_data_by_column()` function.

c) The `indicator` parameter is a string with two values: 'year' or 'platform'. If indicator equals to 'year', display the video game sales in one year ('Name', 'Platform', 'Genre', 'Publisher', 'Global Sales').
   If indicator equals to 'platform', display video game sales for that platform ('Name', 'Year', 'Genre', 'Publisher', 'Global Sales').

   For all the cases, the header row uses the following format:
   $$\texttt{"\{:30s\}\{:10s\}\{:20s\}\{:30s\}\{:12s\}"}$$
   The following rows uses the following string formatting:
   $$\texttt{"\{:30s\}\{:10s\}\{:20s\}\{:30s\}\{:<12,.02f\}"}$$
   Truncate (using slicing) the name and publisher to 25 characters, and the genre to 15 characters.

d) The sum of total global sales should be calculated and displayed. The following string formatting should be used to display the total:
   $$\texttt{"\textbackslash n\{:90s\}\{:<12,.02f\}"}$$

get_genre_data(D2, year) → List of tuples:

a) This function iterates through the dictionary `D2` (which contains the list of regional sales by genre) and return a list of the total regional sales per genre whose value at the year column is equal to 'year'.
   - Parameters: `Dictionary (D2), year (int)`
   - Returns: `List of tuples`

b) The list of tuples should include the following information:
   `[(genre, count, total_na_sales, total_eur_sales, total_jpn_sales, total_other_sales, total_global_sales), ...],`
   Where:
   `genre:` genre name
   `count:` number of games per genre (or number of occurrences of `genre` in that year)
   `total_na_sales:` total sales in North America

`total_eur_sales:` total sales in Europe

`total_jpn_sales:` total sales in Japan

`total_other_sales:` total sales in other regions

`total_global_sales:` total sales in all regions

c) Before returning the list, sort the extracted data by genre name alphabetically and then sort this data by global sales in descending order.

d) If the `year` does not exists in the data, the function should return an empty list.

e) Hint: check the `count` (index 1 of your tuple) before appending a tuple onto your genre list. If the `count` is zero, do not append it.

display_genre_data(genre_list):

a) This function prints a table of all the total regional sales for each genre stored in `genre_list`. This function does not return anything.

f) Parameters: `genre_list(list)`

g) Returns : `nothing`

b) The list of tuples (`genre_list`) is the list returned from the `get_genre_data()` function (which was called in `main` under Option 3).

c) The header row (provided in the skeleton code) uses the following format:
$$\text{"\{:15s\}\{:15s\}\{:15s\}\{:15s\}\{:15s\}\{:15s\}"}$$
The following rows uses the following string formatting:
`"{:15s}{:<15,.02f}{:<15,.02f}{:<15,.02f}{:<15,.02f}{:<15,.02f}"`

d) The sum of total global sales should calculated and be displayed. The following string formatting should be used to display the total:
$$\text{"\textbackslash n\{:75s\}\{:<15,.02f\}"}$$

display_publisher_data(pub_list):

a) This function prints a table of all the total regional sales for each genre stored in `pub_list`. This function does not return anything.

h) Parameters: `pub_list(list)`

i) Returns : `nothing`

b) The list of tuples (`pub_list`) is the list returned from the `get_ publisher_data()` function.

c) The header row uses the following format:
$$\text{"\{:30s\}\{:15s\}\{:15s\}\{:15s\}\{:15s\}\{:15s\}"}$$
The following rows uses the following string formatting:
`"{:30s}{:<15,.02f}{:<15,.02f}{:<15,.02f}{:<15,.02f}{:<15,.02f}"`

Note: "Title" in the header refers to `name` in the tuple in `pub_list`, i.e. index 1, and it must be truncated to 25 characters (Hint: slice).

d) The sum of total global sales should be calculated and displayed. The following string formatting should be used to display the total:

```
"\n{:90s}{:<15,.02f}"
```

`get_totals(L, indicator)` → `List, List:`

a) This function receives a list L of tuples with global sales that was generated by the **get_data_by_column** function. As in that function, there are two values for `indicator`: "`year`" a list of global sales per platform for a single year (from Menu option 1 in `main`) or "`platform`" a list of global sales per year for a single platform (from Menu option 2 in `main`). The function returns two lists: L1, the one with the strings of each platform name (if `indicator == "year"`) or the integers of each year (if `indicator == "platform"`), and the other, L2, is the corresponding global sales. (These two lists will be used for plotting in option 1 and 2.)
   - Parameters: `L (List), indicator (str)`
   - Returns : `List, List`
   - The function displays nothing

b) You need to collect global sales for each platform (or year). The easiest way to do that is with a dictionary with the key is platform (or year) and the value is the sales for that platform (or year). You then build a list, L1, of keys (platforms or years) and a list, L2, of their corresponding values (sales). The first list, L1, should be sorted by `platform` or `year` (depending on the value of `indicator`) in ascending order. L2 needs to have the corresponding values in the same order as L1. (Hint: create and sort L1 and then use the items in L1 and your dictionary of sales to build L2 such that the key:value relationship is maintained in L1:L2.) Return the lists as L1 first and then L2.

`prepare_pie(L)` → `List, List:`

c) This function receives a list of global sales per genre for a particular year (that is, the list L comes from a call to `get_genre_data` for a particular year, the call being done in option 3 of `main`). It returns two lists: L1, one with the strings of each genre name, and the other, L2, is total global sales in that year. These two lists will be used for plotting in option 3 so each genre name in list L1 has its corresponding total global sales in L2 at the same index.
   - Parameters: `L (List)`
   - Returns : `List, List`
   - The function displays nothing

d) The list L2 should be sorted by `total_global_sales` in descending order and L1 should be sorted so the genre name corresponds with the total global sales in L2. Hint: create a list of tuples that you sort first by name and then by sales. Then create the separate lists L1 and L2.

main() :

a) This function is the starting point of the program. The program starts by opening the file with the video game sales and reading the data into three dictionaries. The program will repeatedly prompt the user to select an option from the following menu:

     i. **Option 1:** Display the global sales for all video game titles across multiple platforms in a single year. Prompt for a year (validation is required!, year needs to be an `int`), get the data by calling the `get_data_by_column` function, and then display the selected year's data if the year exists in the data. Prompt the user whether they want to plot the data. If the answer is "y", use `plot_global_sales()` to plot the histogram of the total global sales per publisher.

    ii. **Option 2:** Display the global sales for all video game titles across multiple years in a single platform. Prompt for a platform (validation is required!, cannot be a number)), get the data by calling the `get_data_by_column` function, and then display the selected platform data if the platform exists in the data. Prompt the user whether they want to plot the data. If the answer is "y", get lists to plot by calling the `get_totals` function, and then use `plot_global_sales()` to plot the histogram of the total global sales per year.

    iii. **Option 3:** Display the regional sales for all video game genres. Prompt for a year (validation is required!, year needs to be an `int`), call `get_genre_data`, and then display the selected year data if the year exists using `display_genre_data`. Prompt the user whether they want to plot the data. If the answer is "y", call `prepare_pie` to get the lists to plot, and then use `plot_genre_pie()` to plot a pie chart of the total global sales per genre.

    iv. **Option 4:** Display the regional sales for all the video games by publisher. Prompt the user for a keyword in the publisher. Search for all publishers who have that keyword as a substring, then display the results. **If there are multiple publisher names with the same string, enumerate all possible names**. The publisher names should appears alphabetically because they were read into the dictionary that way; if not, sort them. Use the following string formatting:
        `"{:<4d}{}".format(index,publisher)`

Prompt the user for a publisher index from the displayed list (validation is required!; check that the publisher exists in D3) and display the selected publisher data.

v. **Option 5:** Stop the program.

If the user does not enter any of these options, the program needs to display an error message and prompt again until a valid option is selected.

2. Hints and Notes
    a) Need to print a header line? Using multiple string inside a format method, use the "*" operator to unpack the list. Unpacking is used with iterable items (e.g. lists, strings, and tuples) to take each individual value of the iterable and assign it to various argument positions. In other words, each element from the iterable becomes an individual value. For example:

```
lst = ["I", "Love", "Python!"]
print("{} {} {}".format(*lst)) # This prints: I love Python!
```

    b) Provided functions:
        a. **plot_global_sales(x,y):**
            This function creates bar plots when the user wants to process the global sales data by year or platform. It receives a list of publishers or years and a list of global sales. The bar plots the global sales for each publisher or year. It returns nothing.
            -   Parameters: x (List), y (List)
            -   Returns : nothing
            -   The function displays nothing

        b. **plot_genre_pie(genre, values):** This function creates a pie plot when the user wants to process the global sales data by genre in a particular year. It receives a list of genres and a list of global sales for a year. It returns nothing.
            -   Parameters: x (List), y (List)
            -   Returns : nothing
            -   The function displays nothing

Deliverables

The deliverable for this assignment is the following file:
        proj08.py – the source code for your Python program
Be sure to use the specified file name and to submit it for grading via Mimir before the project deadline.
(See Mimir for function tests details)

Test Case 1:

```
Enter filename: video_game_sale_2016.csv
File not found! Please try again!

Enter filename: video_game_sales_2016.csv

Menu options

    1) View data by year
    2) View data by platform
    3) View yearly regional sales by genre
    4) View sales by publisher
    5) Quit

    Enter choice: 8
Invalid option. Please Try Again!

Menu options

    1) View data by year
    2) View data by platform
    3) View yearly regional sales by genre
    4) View sales by publisher
    5) Quit

    Enter choice: 1

Enter year: 1900
The selected year was not found in the data.

Menu options

    1) View data by year
    2) View data by platform
    3) View yearly regional sales by genre
    4) View sales by publisher
    5) Quit

    Enter choice: 2

Enter platform: sega
The selected platform was not found in the data.

Menu options

    1) View data by year
    2) View data by platform
    3) View yearly regional sales by genre
    4) View sales by publisher
    5) Quit

    Enter choice: 3

Enter year: xyz
```

Invalid year

Menu options

    1) View data by year
    2) View data by platform
    3) View yearly regional sales by genre
    4) View sales by publisher
    5) Quit

    Enter choice: 4

Enter keyword for publisher: gotta catch 'em all!
No publisher name containing "gotta catch 'em all!" was found!

Menu options

    1) View data by year
    2) View data by platform
    3) View yearly regional sales by genre
    4) View sales by publisher
    5) Quit

    Enter choice: 5

Thanks for using the program!
I'll leave you with this: "All your base are belong to us!"

Test Case 2:

```
Enter filename: video_game_sales_small.csv
Menu options

    1) View data by year
    2) View data by platform
    3) View yearly regional sales by genre
    4) View sales by publisher
    5) Quit

    Enter choice: 4
Enter keyword for publisher: act
There are 32 publisher(s) with the requested keyword!
0    activision
1    activision value
2    avalon interactive
3    bigben interactive
4    bmg interactive entertainment
5    disney interactive studios
6    dreamworks interactive
7    eidos interactive
8    empire interactive
9    focus home interactive
10   fox interactive
11   game factory
12   gremlin interactive ltd
13   gt interactive
14   hasbro interactive
15   hip interactive
16   idea factory
17   idea factory international
18   marvelous interactive
19   mattel interactive
20   mentor interactive
21   midas interactive entertainment
22   simon & schuster interactive
23   take-two interactive
24   tdk mediactive
25   time warner interactive
26   tripwire interactive
27   universal interactive
28   victor interactive
29   virgin interactive
30   warner bros. interactive entertainment
31   xicat interactive
Select the index for the publisher to use: 5
```

```
Video Games Sales for disney interactive studios
Title                    North America  Europe        Japan         Other         Global
epic mickey              2,040,000.00   630,000.00    120,000.00    220,000.00    3,010,000.00
who wants to be a million 1,940,000.00  0.00          0.00          0.00          1,940,000.00
toy story mania!         1,040,000.00   660,000.00    0.00          180,000.00    1,880,000.00
disney infinity          970,000.00     340,000.00    0.00          130,000.00    1,440,000.00
disney infinity 3.0      240,000.00     370,000.00    0.00          120,000.00    730,000.00
disney infinity 2.0: marv 270,000.00    250,000.00    0.00          100,000.00    620,000.00
```

```
epic mickey: power of ill      360,000.00     40,000.00      40,000.00      40,000.00     480,000.00
pirates of the caribbean:      300,000.00     10,000.00      10,000.00      30,000.00     350,000.00
pirates of the caribbean:      230,000.00     10,000.00       0.00         20,000.00     260,000.00
that's so raven: psychic       230,000.00      0.00           0.00         20,000.00     250,000.00
the suite life of zack &       230,000.00      0.00           0.00         20,000.00     250,000.00
disney stitch jam               70,000.00      0.00         160,000.00      10,000.00     240,000.00
disney's a christmas caro      210,000.00     10,000.00       0.00         20,000.00     240,000.00
the chronicles of narnia:      150,000.00     40,000.00       0.00         10,000.00     200,000.00
disney's home on the rang      120,000.00     40,000.00       0.00          0.00         160,000.00
fantasia: music evolved        110,000.00     30,000.00       0.00         10,000.00     150,000.00
tim burton's the nightmar      100,000.00     40,000.00       0.00          0.00         140,000.00
walt disney pictures pres       90,000.00     30,000.00       0.00          0.00         120,000.00
disney planes fire & resc       10,000.00     80,000.00       0.00         10,000.00     100,000.00
disney's planes                 40,000.00     30,000.00       0.00         10,000.00      80,000.00
tron 2.0: killer app            40,000.00     20,000.00       0.00          0.00          60,000.00
```

Total Sales
12,700,000.00
Menu options

    1) View data by year
    2) View data by platform
    3) View yearly regional sales by genre
    4) View sales by publisher
    5) Quit

    Enter choice: 5

Thanks for using the program!
I'll leave you with this: "All your base are belong to us!"

Test Case 3:

Enter filename: video_game_sales_2016.csv

Menu options

    1) View data by year
    2) View data by platform
    3) View yearly regional sales by genre
    4) View sales by publisher
    5) Quit

    Enter choice: 1

Enter year: 1999

                         Video Game Sales in 1999

```
Name                      Platform  Genre        Publisher            Global Sales
nfl 2k                    dc        sports       sega                 1,190,000.00
shenmue                   dc        adventure    sega                 1,180,000.00
seaman                    dc        simulation   sega                   520,000.00
sega rally championship 2 dc        racing       sega                   410,000.00
j-league pro soccer club  dc        sports       sega                   360,000.00
soulcalibur               dc        fighting     namco bandai games     340,000.00
virtua striker 2          dc        sports       sega                   320,000.00
pro yakyuu team o tsukuro  dc        sports       sega                   230,000.00
tokyo xtreme racer        dc        racing       genki                  170,000.00
the king of fighters: dre dc        fighting     snk                    100,000.00
blue stinger              dc        adventure    activision             100,000.00
marvel vs. capcom: clash  dc        fighting     capcom                 100,000.00
```

(To many titles to show in this document! See Mimir test for full view or "output3.txt")

```
samurai shodown: warrios     ps      fighting       snk                         10,000.00
derby stallion               sat     sports         ascii entertainment         90,000.00
fire emblem: thracia 776     snes    strategy       nintendo                   260,000.00
digimon adventure: anode     ws      role-playing   namco bandai games         280,000.00
chocobo no fushigi dungeo    ws      role-playing   namco bandai games         180,000.00

Total Sales                                                                251,110,000.00
```

Do you want to plot (y/n)? n

Menu options

```
    1) View data by year
    2) View data by platform
    3) View yearly regional sales by genre
    4) View sales by publisher
    5) Quit

    Enter choice: 2
```

Enter platform: gen

```
                        Video Game Sales for gen
Name                     Year   Genre          Publisher               Global Sales
streets of rage          1990   action         sega                      2,600,000.00
sonic the hedgehog       1991   platform       sega                      4,330,000.00
sonic the hedgehog 2     1992   platform       sega                      6,020,000.00
mortal kombat            1992   fighting       arena entertainment       2,670,000.00
nba jam                  1992   sports         arena entertainment       2,050,000.00
street fighter ii': speci 1992  fighting       sega                      1,650,000.00
gunstar heroes           1992   shooter        sega                        130,000.00
ecco the dolphin         1992   adventure      sega                        120,000.00
shining force ii         1993   strategy       sega                        190,000.00
super street fighter ii  1993   fighting       capcom                      150,000.00
ecco: the tides of time  1993   adventure      sega                         70,000.00
street fighter ii': speci 1993  action         capcom                       70,000.00
streets of rage 3        1993   action         sega                         70,000.00
dynamite headdy          1993   platform       sega                         50,000.00
beyond oasis             1993   role-playing   sega                         50,000.00
sonic & knuckles         1994   platform       sega                      1,820,000.00
sonic the hedgehog 3     1994   platform       sega                      1,760,000.00
disney's the lion king   1994   platform       virgin interactive        1,420,000.00
mortal kombat 3          1994   fighting       acclaim entertainment     1,340,000.00
nba jam tournament editio 1994  sports         acclaim entertainment     1,120,000.00
virtua racing            1994   racing         sega                        260,000.00
lunar 2: eternal blue(sal 1994  role-playing   game arts                   140,000.00
yuu yuu hakusho: makyo to 1994  fighting       sega                         80,000.00
dragon slayer: the legend 1994  role-playing   sega                         80,000.00
j-league pro striker 2   1994   sports         sega                         40,000.00
castlevania bloodlines   1994   platform       konami digital entertainm    40,000.00
puzzle & action: tant-r  1994   misc           sega                         30,000.00

Total Sales                                                              28,350,000.00
```

Do you want to plot (y/n)? n

Menu options

```
    1) View data by year
```

    2) View data by platform
    3) View yearly regional sales by genre
    4) View sales by publisher
    5) Quit

    Enter choice: 3

Enter year: 2016

Regional Video Games Sales per Genre

Genre	North America	Europe	Japan	Other	Global
shooter	16,240,000.00	15,900,000.00	1,060,000.00	5,020,000.00	38,220,000.00
action	9,290,000.00	10,680,000.00	7,070,000.00	3,070,000.00	30,110,000.00
sports	7,540,000.00	12,010,000.00	920,000.00	3,020,000.00	23,490,000.00
role-playing	5,890,000.00	4,280,000.00	6,610,000.00	1,400,000.00	18,180,000.00
fighting	1,840,000.00	1,340,000.00	750,000.00	540,000.00	4,470,000.00
adventure	950,000.00	1,320,000.00	1,180,000.00	370,000.00	3,820,000.00
platform	1,290,000.00	1,390,000.00	110,000.00	440,000.00	3,230,000.00
racing	730,000.00	1,770,000.00	10,000.00	280,000.00	2,790,000.00
misc	760,000.00	660,000.00	1,040,000.00	140,000.00	2,600,000.00
simulation	160,000.00	1,270,000.00	330,000.00	130,000.00	1,890,000.00
strategy	240,000.00	590,000.00	230,000.00	70,000.00	1,130,000.00
puzzle	0.00	10,000.00	0.00	0.00	10,000.00

Total Sales   129,940,000.00

Do you want to plot (y/n)? n

Menu options

    1) View data by year
    2) View data by platform
    3) View yearly regional sales by genre
    4) View sales by publisher
    5) Quit

    Enter choice: 5

Thanks for using the program!
I'll leave you with this: "All your base are belong to us!"

Test Case 4:

Enter filename: video_game_sales_2016.csv

Menu options

    1) View data by year
    2) View data by platform
    3) View yearly regional sales by genre
    4) View sales by publisher
    5) Quit

    Enter choice: 1

Enter year: 1999

```
                        Video Game Sales in 1999
Name                    Platform Genre          Publisher                Global Sales
nfl 2k                  dc       sports         sega                     1,190,000.00
shenmue                 dc       adventure      sega                     1,180,000.00
seaman                  dc       simulation     sega                     520,000.00
sega rally championship 2 dc     racing         sega                     410,000.00
j-league pro soccer club dc      sports         sega                     360,000.00
soulcalibur             dc       fighting       namco bandai games       340,000.00
virtua striker 2        dc       sports         sega                     320,000.00
pro yakyuu team o tsukuro dc     sports         sega                     230,000.00
tokyo xtreme racer      dc       racing         genki                    170,000.00
the king of fighters: dre dc     fighting       snk                      100,000.00
blue stinger            dc       adventure      activision               100,000.00
marvel vs. capcom: clash dc      fighting       capcom                   100,000.00
```
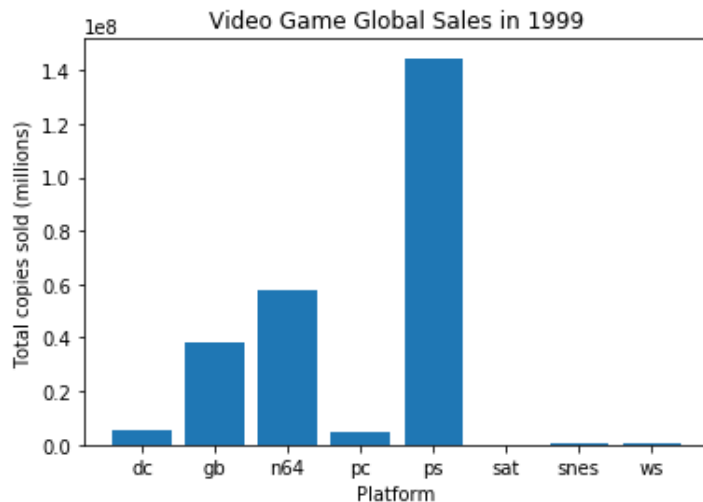
(To many titles to show in this document! See Mimir test for full view or "output4.txt")

```
builder's block         ps       strategy       eon digital entertainment  10,000.00
samurai shodown: warrios ps      fighting       snk                        10,000.00
derby stallion          sat      sports         ascii entertainment        90,000.00
fire emblem: thracia 776 snes    strategy       nintendo                   260,000.00
digimon adventure: anode ws      role-playing   namco bandai games         280,000.00
chocobo no fushigi dungeo ws     role-playing   namco bandai games         180,000.00

Total Sales                                                                251,110,000.00
```

```
Do you want to plot (y/n)? y
```



```
Menu options

    1) View data by year
    2) View data by platform
    3) View yearly regional sales by genre
    4) View sales by publisher
    5) Quit

    Enter choice: 2

Enter platform: gen
```
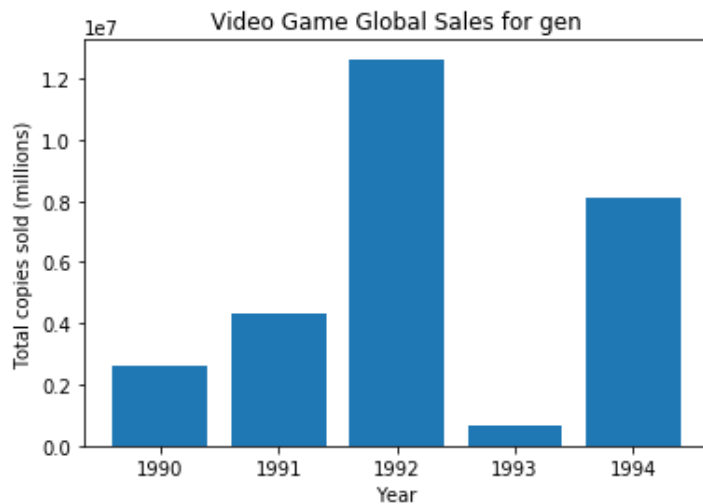
```
                        Video Game Sales for gen
Name                    Year    Genre           Publisher                  Global Sales
streets of rage         1990    action          sega                       2,600,000.00
sonic the hedgehog      1991    platform        sega                       4,330,000.00
sonic the hedgehog 2    1992    platform        sega                       6,020,000.00
mortal kombat           1992    fighting        arena entertainment        2,670,000.00
nba jam                 1992    sports          arena entertainment        2,050,000.00
street fighter ii': speci  1992 fighting        sega                       1,650,000.00
gunstar heroes          1992    shooter         sega                         130,000.00
ecco the dolphin        1992    adventure       sega                         120,000.00
shining force ii        1993    strategy        sega                         190,000.00
super street fighter ii 1993    fighting        capcom                       150,000.00
ecco: the tides of time 1993    adventure       sega                          70,000.00
street fighter ii': speci  1993 action          capcom                        70,000.00
streets of rage 3       1993    action          sega                          70,000.00
dynamite headdy         1993    platform        sega                          50,000.00
beyond oasis            1993    role-playing    sega                          50,000.00
sonic & knuckles        1994    platform        sega                       1,820,000.00
sonic the hedgehog 3    1994    platform        sega                       1,760,000.00
disney's the lion king  1994    platform        virgin interactive         1,420,000.00
mortal kombat 3         1994    fighting        acclaim entertainment      1,340,000.00
nba jam tournament editio  1994 sports          acclaim entertainment      1,120,000.00
virtua racing           1994    racing          sega                         260,000.00
lunar 2: eternal blue(sal  1994 role-playing    game arts                    140,000.00
yuu yuu hakusho: makyo to 1994 fighting         sega                          80,000.00
dragon slayer: the legend 1994 role-playing     sega                          80,000.00
j-league pro striker 2  1994    sports          sega                          40,000.00
castlevania bloodlines  1994    platform        konami digital entertainm     40,000.00
puzzle & action: tant-r 1994    misc            sega                          30,000.00

Total Sales                                                               28,350,000.00
```

Do you want to plot (y/n)? y

Menu options

    1) View data by year
    2) View data by platform
    3) View yearly regional sales by genre
    4) View sales by publisher
    5) Quit

```
    Enter choice: 3

Enter year: 2016

Regional Video Games Sales per Genre
Genre          North America  Europe         Japan          Other          Global
shooter        16,240,000.00  15,900,000.00  1,060,000.00   5,020,000.00   38,220,000.00
action         9,290,000.00   10,680,000.00  7,070,000.00   3,070,000.00   30,110,000.00
sports         7,540,000.00   12,010,000.00  920,000.00     3,020,000.00   23,490,000.00
role-playing   5,890,000.00   4,280,000.00   6,610,000.00   1,400,000.00   18,180,000.00
fighting       1,840,000.00   1,340,000.00   750,000.00     540,000.00     4,470,000.00
adventure      950,000.00     1,320,000.00   1,180,000.00   370,000.00     3,820,000.00
platform       1,290,000.00   1,390,000.00   110,000.00     440,000.00     3,230,000.00
racing         730,000.00     1,770,000.00   10,000.00      280,000.00     2,790,000.00
misc           760,000.00     660,000.00     1,040,000.00   140,000.00     2,600,000.00
simulation     160,000.00     1,270,000.00   330,000.00     130,000.00     1,890,000.00
strategy       240,000.00     590,000.00     230,000.00     70,000.00      1,130,000.00
puzzle         0.00           10,000.00      0.00           0.00           10,000.00

Total Sales                                                                129,940,000.00
```

Do you want to plot (y/n)? y

Video Games Sales per Genre in 2016
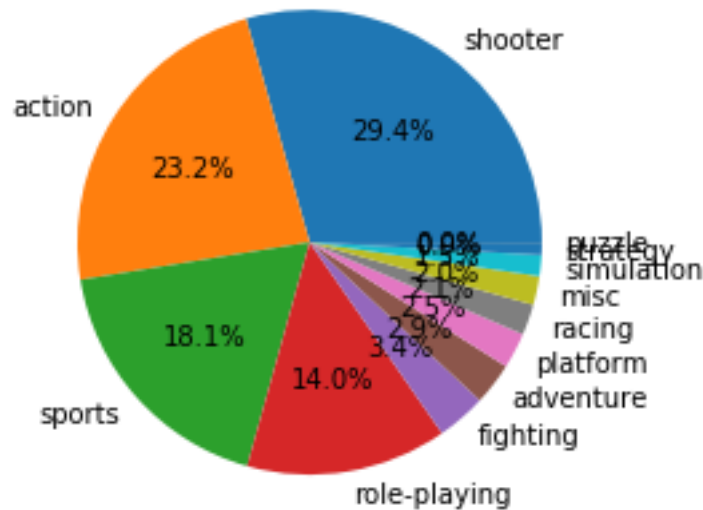
```
Menu options

    1) View data by year
    2) View data by platform
    3) View yearly regional sales by genre
    4) View sales by publisher
    5) Quit

    Enter choice: 5
```

Thanks for using the program!
I'll leave you with this: "All your base are belong to us!"

Grading Rubrics

```
Computer Project #08                                        Scoring
Summary

General Requirements:
   __0__     (5 pts) Coding Standard 1-9
             (descriptive comments, function headers, etc...)

Implementation:
   (4 pts) open_file (No Mimir Test)
      -2 points No try/except
      -2 points No while loop

   (6 pts) read_file function test

   (5 pts) get_data_by_column function test

   (5 pts) get_genre_data function test

   (4 pts) get_publisher_data function test

   (4 pts) get_totals function test

   (4 pts) prepare_pie function test

   (3 pts) Pass Test1

   (5 pts) Pass Test2

   (7 pts) Pass Test3

   (3 pts) Pass Test4


Note: hard coding an answer earns zero points for the whole
project
-10 points for not using main()
```