# IPC 144 Project - Milestone 2

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## Project Problems:

1. Get your problems by logging onto matrix (if you did not do MS 1)
2. Then run the program: ~catherine.leung/getproject

Note that this is completely individualized to you. Your classmates will have a different set. Your profs will check to make sure you are doing the set of problems assigned to you

**Copy and paste the output of getproject here**:

ywang841

Based on your Username: ywang841

Your Problem set is as follows:

A2

B13

C3

Look at the files provided to you in the olympic.zip file (highly recommend opening the files in Excel and answer the following questions. See milestone 1 specs for clarification.

### Problem 1 (Easy level):

a) **What is the problem you are doing for this part (copy the text of the problem, not just the problem number from the specs)**?

Given a year, and whether it was a winter or summer olympics, which country won the most silver medals. Note: ties are possible, if there is a tie, all countries that tie are part of the answer.

b) **Example for your problem. Provide the necessary parameters and what the expected result is**

|  |  |  |
| --- | --- | --- |
| parameters | Season | Year |
| User input | Summer | 1896 |
| Expected result | Greece (18 silver medals) | |

c) **How did you work out what the solution is? Describe your process**

1. Load Data: Open Olympic\_Games\_Medal\_Tally.csv in Excel.
2. Filter Data: In the "edition" column (first column), apply a filter for rows containing “1896” and “Summer” to select the relevant data for the specified year and season.
3. Sort by Silver Medals: Sort the filtered data by the "silver" column in descending order to place the country with the highest silver medal count at the top.
4. Identify Result: Note the country (or countries, if there’s a tie) with the highest number of silver medals.
5. Verify: Cross-check the sorted data to confirm the result is correct.

### Problem 2 (Intermediate level):

a) **What is the problem you are doing for this part (copy the text of the problem, not just the problem number from the specs)**?

Given a year, and whether it was a summer or winter olympics, find the number of unique events at the olympics

b) **Example for your problem. Provide the necessary parameters and what the expected result is**

|  |  |  |
| --- | --- | --- |
| parameters | Season | Year |
| User input | Summer | 1908 |
| Expected result | 219 unique events | |

c) **How did you work out what the solution is? Describe your process**

1. Load Data: Open Olympic\_Athlete\_Event\_Results.csv in Excel.
2. Filter Data: Apply a filter to select rows that contain “1908” and “Summer” in the "edition" column.
3. Identify Unique Events: Use Excel’s "Remove Duplicates" feature on the "event" column to find all unique events for the filtered year and season.
4. Count Unique Events: After removing duplicates, count the total number of unique events using Excel’s summary tool or simply observe the resulting list count after removing duplicates.
5. Verify: Cross-check the list of unique events to confirm the count is accurate.

### Problem 3 (Hard level):

**a) What is the problem you are doing for this part (copy the text of the problem, not just the problem number from the specs)?**

Given a year and whether it was summer or winter olympics produce a histogram of the 10 top ranked countries based on the number of total number medals won. Break ties with number of golds, then number of silvers, then number of bronzes.

**b) Example for your problem. Provide the necessary parameters and what the expected result is**

|  |  |  |
| --- | --- | --- |
| parameters | Season | Year |
| User input | Summer | 1896 |
| Expected result |  | |

**c) How did you work out what the solution is? Describe your process**

1. Load Data: Open Olympic\_Games\_Medal\_Tally.csv in Excel.
2. Filter Data: Apply a filter that contains “1896” and "Summer" in the "edition" column.
3. Sort Data: Sort the data based on the "total" column in descending order. For ties, sort by the number of golds, then silvers, and then bronzes (add levels).
4. Select Top 10 Countries: Select the top 10 rows of country based on the sorted medal.
5. Create Histogram: Use Excel's chart tools to create a histogram of the top 10 countries.

### Finding Commonalities:

**What are the common tasks that you might need to do for your 3 problems?**

1. Loading and Reading Data: All problems involve reading data from a CSV file, so handling file input and data storage is required.
2. Data Filtering: Each problem requires filtering based on a specific year and season.
3. Data Sorting and Calculation: Sorting by medal count or other criteria is common across all tasks.
4. Displaying Results: Each problem requires displaying results, either through text output or visualization (e.g., histogram)

### Declaration:

**Provide a declaration for how you will store the data that you need for your problems.**

**//struct for storing medal info**

**Struct medalCount{**

**Char country[50];**

**int year;**

**char season[10]; //** **Season: "Summer" or "Winter"**

**int gold;**

**int silver;**

**int bronze;**

**int total;**

**};**

**//struct for storing event info**

**struct Event {**

**int year;**

**char season[10]; // "Summer" or "Winter"**

**char event[100];**

**};**

**Provide the prototypes of the set of functions that you will need for your program. For each function clearly state:**

* **what your parameters are and what they will be used for**
* **what your return type is**
* **what your function will do**

void readMedalFile(const char \*filename, struct medalCount\* data, int \*size, int year, const char \*season);

Parameters:

filename: Name of the file to open

data: A pointer to an array of struct medalCount where the medal data will be stored

size: Pointer to an integer to store the total size of array stored.

year: Year to filter the events

season: Season to filter the events ("Summer" or "Winter").

Return Type: void

Purpose: Reads the CSV file for problem 1 and 3, filters by year and season, and stores the relevant data in the data array. Updates size with the number of rows processed.

void readEventFile(const char \*filename, struct Event\* data, int \*size, int year, const char \*season);

Parameters:

filename: Name of the file containing event data

data: A pointer to an array of struct Event where the event data will be stored

size: Pointer to store the size of array stored.

year: Year to filter the events

season: Season to filter the events ("Summer" or "Winter").

Return Type: void

Purpose: Reads the CSV file for event data, filters by year and season, and stores the relevant data in the data array. Updates size with the number of rows processed.

int isUnique(struct Event\* data, int size);

Parameters:

data: A pointer to the array of Event structs

size: The size the data array (total number of events).

Return Type: int (The number of unique events)

Purpose: This function reads through the data array and filters out duplicate events based on the event name. It returns the count of unique events.

void topSilver(struct medalCount\* data, int size, struct medalCount\* result);

parameters:

data: pointer to the array of medalCount structs containing filtered medal data

size: The size of the data array.

result: A pointer to an array of medalCount structs where the countries with the most silver medals will be stored.

Return Type: void

Purpose: Iterate through the data array to determine the maximum number of silver medals won. Store the results in the result array.

void top10Medal(struct medalCount\* data, int size, struct medalCount\* result);

parameters:

data: pointer to the array of medalCount structs containing filtered medal data

size: The size of the data array.

result: A pointer to an array of medalCount structs where the top 10 countries will be stored.

Return Type: void

Purpose: Iterate through the data array to determine top 10 countries with the highest medal counts and store them in the result array.