Project 1

Overview

The project is to create a turn-based role-playing game between two (computer) players in which they battle each other's champions.

Game Rules:

- The user selects the number of rounds to be run between the two players.
- At the start of each round, for both players a champion is created with the following two properties.
    - CHAMPION – randomly assigned with a 1/3rd (33.33%) probability each for **`MAGE, FIGHTER, TANK`**
    - POINTS – assigned based on these random chances:
        - **`MAGE`** – a random number between 1 and 8 inclusive.
        - **`FIGHTER`** – a random number between 3 and 7 inclusive.
        - **`TANK`** – a random number between 5 and 9 inclusive.
- Once the champions have been assigned for both the players for that round, a fight happens, and the outcome is decided based on the following table. Each player either receives or loses their current round's points depending on the conditions mentioned in the table below.
- The above process is repeated for each round and the game continues until all the rounds have been played. The player with the higher number of points at the end of the all the rounds wins.

	MAGE	**FIGHTER**	**TANK**
MAGE	Player with higher POINTS wins. The winning player gains their current points. The losing player loses their current points. If tie, nothing happens.	Player with higher POINTS wins. If MAGE wins, they gain their current points, but FIGHTER gets no penalty. If FIGHTER wins, they gain no reward, but MAGE loses their current points. If tie, nothing happens.	MAGE gains their current points. TANK loses their current points.
FIGHTER		Both players win and gain all their current points.	TANK loses but with no penalty. FIGHTER player wins and gains current points.
TANK			Nothing happens – no penalty or reward.

Task 1 – create and write "functions.h"

- Include the header guard in the correct format.
- Create an **`enum`** named **`CHAMPION`** for the three types:
    - **`MAGE, FIGHTER, TANK`**
- Write all the function prototypes – see below.

Task 2 – create and write "functions.c"

Write the following functions that uses the game rules described:

- **`int getRandomNumber( int min, int max )`** – This function computes a random number between min and max, **inclusive**, and returns it.
- **`CHAMPION createChampion( )`** – This function decides the type of the Champion based on the probability values mentioned in game rules (**33.33% each for MAGE, FIGHTER, TANK**).
- **`int getChampionPoints( CHAMPION c )`** – This function calculates and return the points associated with the given champion type, based on the rules mentioned above.
- **`void printChampion( CHAMPION c )`** – This function prints out the champion type as a string when passed as an enum.
- **`void playRound(int* p1_total, int* p2_total, CHAMPION c1, int c1_points, CHAMPION c2, int c2_points)`** – This function plays the game according to the rules mentioned in the table. It takes as input the information for the given round - both champions (champion type + points). It also takes as input the total points for both players at the start of the round as a pointer so as to be able to update the total points as per the rules for that round. It does not return any value as the values are updated directly as pointers.

Task 3 – create and write "main.c"

Write the main function that calls the other functions listed above in reference to the game. The sample output shown below will help guide you on the code and the printing needed.

Submission

Be sure that your code follows the class coding style requirements. Your output should be similar in format as compared to the sample output shown below. Create a folder named your abc123, place all program files in this folder. Zip the folder and submit this abc123.zip file.

Rubric

General Requirements – submission must have all files as per requirement and the code must compile properly without any errors. If not, the submission will be returned with a score of 0.

[05 points] - functions.h
- [1 points] - header guard
- [2 points] - enum
- [2 points] - function prototypes

[25 points] – functions.c()
- [3 points] - getRandomNumber()
- [2 points] - createChampion()
- [3 points] - getChampionPoints()
- [2 points] - printChampion()
- [15 points] - playRound()

[20 points] - main.c file

Sample Output

RUN-1

```
Enter the number of rounds: 5

ROUND 1
--------
Player points at the start of the round  --  P1 = 0          P2 = 0
P1 : MAGE-5  vs   P2 : FIGHTER-4
Player 1 (MAGE) wins and gains their current points.
Player 2 (FIGHTER) loses but with no penalty.
Player points at the end of the round  --  P1 = 5          P2 = 0


ROUND 2
--------
Player points at the start of the round  --  P1 = 5          P2 = 0
P1 : FIGHTER-7     vs   P2 : FIGHTER-7
Both players gain their current points.
Player points at the end of the round  --  P1 = 12          P2 = 7


ROUND 3
--------
Player points at the start of the round  --  P1 = 12         P2 = 7
P1 : MAGE-2  vs   P2 : TANK-6
Player 1 (MAGE) wins and gains their current points.
Player 2 (TANK) loses their current points.
Player points at the end of the round  --  P1 = 14          P2 = 1


ROUND 4
--------
Player points at the start of the round  --  P1 = 14         P2 = 1
P1 : FIGHTER-4     vs   P2 : FIGHTER-3
Both players gain their current points.
Player points at the end of the round  --  P1 = 18          P2 = 4


ROUND 5
--------
Player points at the start of the round  --  P1 = 18         P2 = 4
P1 : FIGHTER-3     vs   P2 : MAGE-7
Player 1 (FIGHTER) loses but with no penalty.
Player 2 (MAGE) wins and gains their current points.
Player points at the end of the round  --  P1 = 18          P2 = 11


GAME OVER!!
P1 Won
```

```
################ RUN-2 ################

Enter the number of rounds: 5

ROUND 1
--------
Player points at the start of the round  --  P1 = 0         P2 = 0
P1 : TANK-9  vs   P2 : FIGHTER-4
Player 1 (TANK) loses but with no penalty.
Player 2 (FIGHTER) wins and gains their current points.
Player points at the end of the round  --  P1 = 0          P2 = 4


ROUND 2
--------
Player points at the start of the round  --  P1 = 0         P2 = 4
P1 : MAGE-2  vs   P2 : MAGE-4
Player 1 (MAGE) loses their current points.
Player 2 (MAGE) wins their current points.
Player points at the end of the round  --  P1 = -2          P2 = 8


ROUND 3
--------
Player points at the start of the round  --  P1 = -2        P2 = 8
P1 : TANK-9  vs   P2 : MAGE-3
Player 1 (TANK) loses their current points.
Player 2 (MAGE) wins and gains their current points.
Player points at the end of the round  --  P1 = -11         P2 = 11


ROUND 4
--------
Player points at the start of the round  --  P1 = -11       P2 = 11
P1 : TANK-9  vs   P2 : MAGE-2
Player 1 (TANK) loses their current points.
Player 2 (MAGE) wins and gains their current points.
Player points at the end of the round  --  P1 = -20         P2 = 13


ROUND 5
--------
Player points at the start of the round  --  P1 = -20       P2 = 13
P1 : MAGE-7  vs   P2 : FIGHTER-3
Player 1 (MAGE) wins and gains their current points.
Player 2 (FIGHTER) loses but with no penalty.
Player points at the end of the round  --  P1 = -13         P2 = 13


GAME OVER!!
P2 Won
```

```
################ RUN-3 ################

Enter the number of rounds: 5

ROUND 1
--------
Player points at the start of the round  --  P1 = 0         P2 = 0
P1 : MAGE-4  vs   P2 : TANK-8
Player 1 (MAGE) wins and gains their current points.
Player 2 (TANK) loses their current points.
Player points at the end of the round  --  P1 = 4          P2 = -8


ROUND 2
--------
Player points at the start of the round  --  P1 = 4         P2 = -8
P1 : TANK-5  vs   P2 : FIGHTER-7
Player 1 (TANK) loses but with no penalty.
Player 2 (FIGHTER) wins and gains their current points.
Player points at the end of the round  --  P1 = 4          P2 = -1


ROUND 3
--------
Player points at the start of the round  --  P1 = 4         P2 = -1
P1 : MAGE-8  vs   P2 : FIGHTER-3
Player 1 (MAGE) wins and gains their current points.
Player 2 (FIGHTER) loses but with no penalty.
Player points at the end of the round  --  P1 = 12         P2 = -1


ROUND 4
--------
Player points at the start of the round  --  P1 = 12        P2 = -1
P1 : TANK-7  vs   P2 : FIGHTER-4
Player 1 (TANK) loses but with no penalty.
Player 2 (FIGHTER) wins and gains their current points.
Player points at the end of the round  --  P1 = 12          P2 = 3


ROUND 5
--------
Player points at the start of the round  --  P1 = 12        P2 = 3
P1 : MAGE-3  vs   P2 : MAGE-6
Player 1 (MAGE) loses their current points.
Player 2 (MAGE) wins their current points.
Player points at the end of the round  --  P1 = 9          P2 = 9


GAME OVER!!
TIE
```