C++ Advanced – Exam 1 (07 Apr 2019)

Write C++ code for solving the tasks on the following pages.

Code should compile under the C++11 standard.

Submit your solutions here: https://judge.softuni.bg/Contests/1441/CPlusPlus-Advanced-Exam-07-Apr-2019

Any code files that are part of the task are provided under the folder **Skeleton**.

Please follow the exact instructions on uploading the solutions for each task.

Task 4 – Warcraft IV

You are given 7 files: main.cpp, Defines.h, Structs.h, Hero.h, Archmage.h, DeathKnight.h and DrawRanger.h.

The classes 'Archmage', 'DeathKnight' and 'DrawRanger' represents your 3 heroes.

Each hero has the following attributes:

> ➤ name – name of the character;
> ➤ maxMaxa – the character mana pool for casting spells. (If you don't know what 'mana' is – think of it as a currency required to cast a spell).
> ➤ baseManaRegenRate – tell you how much mana points your character restores when an ActionType::REGENERATE_MANA is performed. Keep in mind that your character can **NOT** have more mana points than his "maxMaxa". Your character can restore mana points **UP** to his "maxMaxa".

NOTE: The **Archmage** class has a special bonus attribute: "manaRegenModifier", which scales up his mana regeneration (multiplies baseManaRegenRate to manaRegenModifier) each time the character performs an ActionType::REGENERATE_MANA.

Each character has his unique BASIC and ULTIMATE spells that are already predefined.

```
struct Spell {
        std::string name;        //name of the spell
        int        manaCost; //mana requirement to cast this spell
};
```

You are given the **main()** function, which first populates Archmange, DeathKnight and DrawRanger classes constructors and then reads a single integer value of memory (N).

- The next N whitespace separated integer are special ActionType commands;
  ```
  enum ActionType {
          CAST_BASIC_SPELL,
          CAST_ULTIMATE_SPELL,
          REGENERATE_MANA
  };
  ```
  > ➤ "0" or ActionType::CAST_BASIC_SPELL command – all heroes should **TRY** to casts their BASIS spells (if they have enough mana points);
  > ➤ "1" or ActionType::CAST_ ULTIMATE _SPELL command – all heroes should **TRY** to casts their ULTIMATE spells (if they have enough mana points);
  > ➤ "2" or ActionType::REGENERATE_MANA command – all heroes should use their ability to regenerate mana;

Your task is to study the provided Skeleton and implement the missing functionalities for Archmage.cpp, DeathKnight.cpp and DrawRanger.cpp files with a few things in mind:

After each ActionType::CAST_BASIC_SPELL or ActionType::CAST_ULTIMATE_SPELL each hero should print to the console a result of his actions.

> ➢ For successful cast you should print: 'spell name' casted for 'spell mana' followed by a **newline**.
> ➢ For unsuccessful cast you should print: 'spell name' – not enough mana to cast 'spell name' followed by a **newline**.

Note: ActionType::REGENERATE_MANA does **NOT** print any result to the console.

Special hero abilities:

> ➢ Archmage – if SpellType::ULTIMATE is successfully casted the Archmage gets **immediately** a free ActionType::REGENERATE_MANA.
> ➢ DeathKnight – if SpellType::ULTIMATE is successfully casted the DeathKnight gets **immediately** a free ActionType::CAST_BASIC_SPELL. **Important note**: on the free basic cast spell you should print to the console – 'spell name' casted for 0 mana.
> ➢ DrawRanger – if SpellType::BASIC is successfully casted the DrawRanger gets **immediately** a free ActionType::CAST_BASIC_SPELL. **Important note**: on the free basic cast spell you should print to the console – 'spell name' casted for 0 mana.

Your task is to study the code and implement the function so that the code accomplishes the task described.

You should submit a single `.zip` file for this task, containing **ONLY** the files you created.

The Judge system has a copy of the other files and will compile them, along with your file, in the same directory.

Restrictions

All heroes **at any time** can have mana points from **[0, individual 'maxMana']** inclusively;

Examples

Input	Output
Archmage 480 80 2 DeathKnight 420 70 DrawRanger 360 60 0 1	Archmage casted Water Elemental for 120 mana DeathKnight casted Death Coil for 75 mana DrawRanger casted Silence for 90 mana DrawRanger casted Silence for 0 mana Archmage casted Mass Teleport for 180 mana DeathKnight casted Animate Dead for 200 mana DeathKnight casted Death Coil for 0 mana DrawRanger casted Charm for 150 mana
Values 180 50 3 Are-not 220 80 Hardcoded 160 90 1 1	Values casted Mass Teleport for 180 mana Are-not casted Animate Dead for 200 mana Are-not casted Death Coil for 0 mana Hardcoded casted Charm for 150 mana Values - not enough mana to cast Mass Teleport Are-not - not enough mana to cast Animate Dead Hardcoded - not enough mana to cast Charm

ConjurusRex 280 80 1 Arthas 320 40 Sylvanas 160 50 1 2 2 1	ConjurusRex casted Mass Teleport for 180 mana Arthas casted Animate Dead for 200 mana Arthas casted Death Coil for 0 mana Sylvanas casted Charm for 150 mana ConjurusRex casted Mass Teleport for 180 mana Arthas casted Animate Dead for 200 mana Arthas casted Death Coil for 0 mana Sylvanas - not enough mana to cast Charm