

Starship Builder

You are part of a sci-fi gaming club that plays a starship battle game which let the players make their own ship by a set of charts and you are asked by the club members to write a program to aid in calculating the viability of a custom ship.

The method that ships are built are from a set of data charts. these ship data charts contains ship type, class name, mass limit, defensive systems, weapons sets, power systems, crew size, and other systems.

You are to build a file that would simplify all the data sets into one data set. Then calculate the total mass of systems and compare it to the mass limit. Make note that the power system are sufficient to power all the systems. Calculate the movement cost by class and mass limit. Also find out what the life support cost is by mass limit and crew size. The hull points are calculated by using the total defense points and mass limit. The shield cost by mass limit and total power.

You are to report the ship's viability as, underpowered, over loaded, under engineered, or balanced.

Underpowered is when the power cost of all systems is more than the power available. Over loaded is when the total mass of all systems is more than the mass limit. Under engineered is when the total mass is less than 75% of the mass limit. Balanced is when the ship has sufficient power and the mass is at 75% of the mass limit to the mass limit.

The formulas for:

Ship Class is: Battleship = 1, Battlecruiser = 2, Carrier = 2, Cruiser = 3, Destroyer = 4, and Frigate = 5

Life support cost is: $[\text{crew size} / (\text{mass limit} / 10)]$

Hull points is: $[(\text{mass limit} / 10) - \text{total defense point}]$

Movement cost is: $[(\text{mass limit} / 100) / \text{class}]$

Shield Cost is: $[\text{total power} / (\text{mass limit} / 100)]$

Each ship that is passed in will have multiple sources for their stats, so this will be a multiple input for all data points, then compile all data files in to a single data file for each ship passed in. You must make sure each chart that is called for is the right type of chart for the input, such as if someone calls for a weapons chart in a defensive systems input, you must make a note of it, also make note if the chart called for doesn't exist.

Input

The input file name will be "buildList.txt" for the main input and the charts will follow their letter name with txt as the file type extension (ie A.txt).

The first line is an integer that is the number of ships being passed in, then the master chart of each ship separated by blank lines. For the class of each ship will be only in one of 6 classes, Battleship, Battlecruiser, Carrier, Cruiser, Destroyer, and Frigate.

For the master ship chart, it has ship name, ship class, crew size, mass limit, and then followed up with a set of chart letters. These letters are for each system charts that are used for each ship, there will be a weapons set chart, defensive systems chart, power systems chart, and other system chart. All other charts are stored as separate files, named by their letter.

The charts will have a letter for a name, such as 'A' for example, the range of letters is A to Z then AA to ZZ, for two letter names the letter repeats. For each chart that is used, the first line will have the name of the chart and the systems type, the second line is total mass of the systems. For Weapons, defensive, and other systems, their input will have power cost on the third line. For Power systems input will have total power produced on the third line. Starting at the fourth line of any input chart will be the list of items of said chart.

Output

The output data of each ship should put the data in order of importance, with items that are commonly used at the top and items that are least used on the bottom. The ship name and class should always be on the top of the data chart with each on their own lines. Then place life support system costs and crew size on the next two lines and place total mass over mass limit on the fifth line, after that then place items based off their frequency of use. The “most frequently” used items are weapons and defensive systems, this include shield cost and hull points in defensives system part. The moderately used items are power systems, this also includes movement cost. The “least frequently” used items are other ship systems, which is a case by case on what these systems are.

Then report the ship viability after the data chart. The output name is “ships.txt”.

Sample Input

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Name: Titan
Class: Battleship
Crew: 1500
Mass limit: 5000
WS - H
DS - Z
PS - MM
OS - YY

Sample Output

Name: Titan
Class: Battleship
Crew: 1500
LSC: 3
mass total/limit: 4500/5000

Weapons:
FCS lock-on: +5
Range Finder effect: +2
10x laser batteries: 4\F, 2\S, 2\P, 2\A
4x plasma torpedoes: 2\F, 1\S, 1\P
12x anti-fighter laser batteries: 6\SS, 6\PS
4x Missile racks: 2\SS, 2\PS

Defensive Systems:
Hull Points: 320
Shield cost: 1.8
Shield F: 50
Shield S: 30

Shield P: 30

Shield A: 20

Armor F: 20

Armor S: 10

Armor P: 10

Armor A: 5

Power Systems:

Movement Cost: 5

Engine Power: 80

Auxiliary Power: 10

Battery Capacitance: 12

Other Systems:

3x Grappling hooks: 1/P, 1/S, 1/A

Hanger bay: Size 3

4x Transporters

The ship is a balanced design.