# Mission to Mars


A space voyage took off from Earth, to planet Jupiter to check the atmosphere and the surface and collect information for NASA. This time, NASA sent a crew to collect samples and return to Earth safely. While the crew was travelling near planet Mars, they experienced an engine trouble and they couldn't continue on their main course. When their engines stopped, the ship which was carrying the crew was drifting in a way they couldn't understand. They immediately sent their coordinates and information regarding remaining resources to Houston Space Center to get a rescue scenario.

Members at Houston first wanted to calculate the drifting path and check whether they can land on Mars until the rescue teams come to extract the crew. Houston had previously sent resources to Mars so that the crew could survive on Mars until a rescue arrives. Houston engineers examined the equations and wanted to calculate a landing course for the space ship. Information regarding those landing variables are as follows. You have to calculate and test the first phase of drifting course of the crew ship.

The force acting on a celestial body in space is with a given mass m1 and planet mass m2

$$F = G\frac{m_1 m_2}{r^2}$$

- F is the force between the masses
- G is the gravitational constant (6.674×10^−11 N · (m/kg)^2);
- m1 is the first mass;
- m2 is the second mass;
- r is the distance between the centers of the masses.

Ref :https://en.wikipedia.org/wiki/Newton%27s_law_of_universal_gravitation

You have been given the mass of the ship as 10,600kg (not the weight)

The engineers will have to calculate the direction of the force and the nearest planet of the given direction as well. Assume that the force does not change when the ship is travelling from the its initial position to the nearest planet.

**Input Format**

First line contains an array mass of the planets into 10^24kg.
Next lines contains spherical coordinates of the planets as (r,theta, psi) where,

r is the distance from the ship to the planet divided by 1x10^6 in kilo meters
theta - angle along the Z-axis in radians

psi - angle along the X-axis in radians

**Constraints**

number of planets <= 10000

**Output Format**

Index of the planet in the mass array.
Drifting force to 3 decimal places in Newtons.
Distance to planet when the shuttle is the nearest to the planet to 3 decimal places and in kilometers.

**Sample Input**

0.330 4.87 0.642 428 568
57.9 5.135 4.554
108.2 3.109 5.474
149.6 0.746 2.073
227.9 4.912 4.395
778.6 5.948 0.046

**Sample Output**

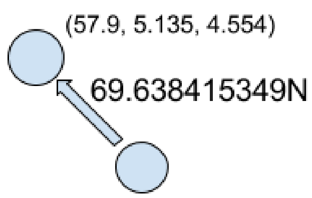
1
5640.105N
14986834.138km

**Explanation**

First get the resultant force acting on X from Planets. For the first planet

$$F = G\frac{m_1 m_2}{r^2}$$

$$\begin{aligned} F &= 6.674\times10^{-11} \text{x} 0.330 \text{x} 10^{24} \text{x} 10600/(57.9 \text{x} 10^{6})^{2} \\ &= 69.638415349\text{N} \end{aligned}$$




Likewise the total resultant magnitude is 5640.105N.
And when it comes to the perpendicular distance on the direction of force its 14986834.138km