

## C Programming

### PROGRAM 3 - *Use of Functions*

#### Problem:

The science center in your hometown is in need of a way to explain gravity and mass. They have asked for a program that will allow a visitor to enter his/her weight and then calculate the equivalent weight on the Moon, Mars or Jupiter. The conversion chart necessary is

<b><i>Planet</i></b>	<b><i>Conversion factor</i></b>
Moon	1/6 of weight on planet Earth
Mars	0.39 times weight on planet Earth
Jupiter	2.33 times weight on planet Earth

Write a program that allows the user to enter his/her weight on Earth and an "m" for moon, an "r" for Mars, or a "j" for Jupiter. It then calculates his/her equivalent weight using the following user-written functions:

	<b>User-written Function Name</b>	<b>Tasks the function should perform</b>
a)	<b>main</b>	Prompts the user for the visitor's weight and the planet he/she wishes to visit, then determines which function to call. Passes weight and to appropriate function.
b)	<b>moon</b>	Calculates weight on the Moon and displays
c)	<b>mars</b>	Calculates weight on the planet Mars and displays
d)	<b>jupiter</b>	Calculates weight on the planet Jupiter and displays
e)	<b>err_msg</b>	Prints an appropriate error message if weight is less than zero or if the planet chosen by the visitor is not one that can be calculated

Make the program reusable i.e.) Ask the user if he wishes to enter data again:

#### Process:

1. Display a welcome message
2. Allow the user to enter the data (be sure to add a check for valid data)

#### Example: (the underlined data is input by the user)

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Do you want to check you weight on a different
planet (Y/N)                                Y
Enter your weight (on Earth)                 -12
Your weight must be a positive number - please re-
enter                                       120
Enter the planet (m, r, or j - only)         X
Planet must be m, r, or j - only - please re-enter m

```

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3. Calculate the weight and display the message.

#### Example:

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```

On the Moon you would weigh                20 lbs
Do you want to check your weight on a different
planet (Y/N)                                Y

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***Upon completing this program REMEMBER to submit logic (flowchart, pseudocode, or algorithm) and the source code file.***