7. Solve the following system of equations and determine the value of the determinant, and the inverse of the matrix of coefficients.

$$16s + 32u + 33p + 13w = 91$$
$$5s + 11u + 10p + 8w = 16$$
$$9s + 7u + 6p + 12w = 5$$
$$34s + 14u + 15p + w = 43$$

8. Engineers use both English and SI (Systeme International d'Unites) units on a regular basis. Some fields use primarily one or the other, but many combine the two systems. For Example, the rate of energy input to a stream power plant from burning fossil fuels is usually measured in Btu/hour. However, the electricity produced by the same plant is usually measured in joules/s (Watts). Automobile engines, by contrast, are often rated in house power or in ft lb_f/s. Here are some conversion factors relating these different power measurements:

1kw = 3412.14 Btu/h = 737.56 ft lb_f/s
1 hp = 550 ft lb_f/s = 2544.5 Btu/h

Generate a table of conversions from kW to hp. The table should start at 0kW and end at 15 kW. Use the input function to let the user define the increment between table entries. Use disp and fprintf to create a table with a title, column headings, and appropriate spacing.

9. Given the following relation:

$$X^2 = \sum_{i=1}^{k} \frac{(x_i - e_i)}{e_i}$$

Where e_i and x_i are independent vectors of length k. If $e_i < 5$, then e_i and x_i must be added to their respective e_{i+1} and x_{i+1} values. If the sum of $e_i + e_{i+1}$ is still <5, then e_{i+2} is added to the sum of $e_i + e_{i+1}$. This process is repeated until the sum is ≥5. When $e_i \geq 5$ and the sum of the remaining e_{i+1}, e_{i+2}, ... e_k is less than 5, then these remaining values are added to e_i. Write a script that computes X^2 under the conditions described above. Check your results with the following vectors, which represent three different cases:

a. x=[1 7 8 6 5 7 3 5 4]; e=[2 6 10 4 3 6 1 2 3];
b. x=[7 11 13 6]; e=[6 10 15 7];
c. x=[3 14 20 25 14 6 2 0 1 0]; e=[4 12 19 19 14 8 4 2 1 1];

HINT: The most compact script will be obtained by performing tests on the elements of *cumsum(e),* where the length of e changes as the evaluation procedure progresses.