**Assignment - 1**

Q1:

In the given problem, the decision variables are the number of Collegiate(**C**) and Mini(**M**) bags produced per week. Hence there are two decision variables.

Q2:

We can interpret the objective function as maximizing the profits. As given in the problem, C generates a unit profit of 32$ and M has unit profit of $24.

**Maximize, Z= 32C + 24M**

Q3:

There are 2 constraints in the problem:

**Resource constraint:**

Back Savers has supplier of Nylon and receives **5000 sq. Ft**. each week. Each **C** requires **3 sq. Ft** whileeach **M** requires **2 sq. Ft.**

**3C + 2M <= 5000**

**Time constraint:**

Each **C** requires 45 minutes of labor to produce the profit of $32 and each **M** requires 40 minutes of labor to produce the profit of $24. Back Savers has 35 laborers that each provide 40 hours of labor per week.

Here, **35\*40= 1400(labor hours)**

**45C + 40M <= 84000(labor mins)**

Q4:

Mathematical formulation to the problem:

**Maximize, Z= 32C + 24M**

**Constraints,**

**C<= 1000, C>=0**

**M<= 1200, M>=0**

**3C + 2M <=5000**

**45C + 40M <=84000**