**Assignment-1**

Question 1:

For the given problem, the Collegiate(C) and the Mini(M) are two decision variables, because based on number of Collegiate(C) and the Mini(M) bags produced per week, labor time and profits has been formulated.

Question 2:

The objective function can be interpret as maximizing the profits. As given in the problem, Collegiate(C) generates a unit profit of **32$** and Mini(M) has unit profit of **$24**.

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

Question 3:

There are 2 constraints in the problem:

**Resource constraint:**

Back Savers has a Nylon source and receives **5000 square feet** each week. Each Collegiate(C) needs **3 square feet**, but each Mini(M) only needs **2 square feet**.

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

**Time constraint:**

Each Collegiate(C) requires 45 minutes of labor to generate a profit of $32, while each Mini(M) requires 40 minutes to generate a profit of $24. Back Savers employs 35 people who work a total of 40 hours each week.

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

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

Question 4:

Mathematical formulation for this LP problem:

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

**Constraints,**

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

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

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

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