

Case Study: The North Face



After obtaining useful results and actionable insights from the Monte Carlo simulation, now the operation head Tom Hanks from The North Face wants to continue using prescriptive analytics to solve other business problems for FashionTech.

One of the difficult decisions that he has to make every winter season is deciding how many parkas and winter jackets for women to produce. Both products use the same materials and require very similar sewing and stitching skills and manufacturing steps, and, therefore, compete for the same resources. The main difference between the two products is the length—jackets are generally shorter and end at the waist or just below, while parkas are longer fitting, and therefore offer more warmth. Due to their length, parkas have a higher manufacturing cost, but also have a higher selling price and generate a greater profit per unit. Jackets and parkas come in different sizes, but the most popular ones are the medium size. Tom will start by focusing on analyzing data for the medium-sized jackets and parkas. Based on his records, the per-unit profits for a winter jacket and parka are \$9 and \$12.50, respectively. Also, a medium-sized jacket requires approximately 8.5 feet of fabric, while a medium-sized parka requires about 12.5 feet of the same fabric. The amount of machine time needed to produce a jacket and a parka are 1.5 hours and 2 hours, respectively. A tailor usually spends about 2 hours on sewing and stitching for a winter jacket and about 3 hours for a parka. FashionTech has a monthly contract with its supplier to procure 4,000 feet of the required fabric. The amount of machine time allocated to producing the two products is 650 hours per month, and each month a number of skilled tailors are assigned to these products for approximately 900 hours.



Historically, FashionTech has never sold more than 150 parkas or 400 jackets in a month, and, therefore, Tom wants to make sure that the monthly production rates of parkas and winter jackets are no more than these historical limits. Use the information provided to help Tom formulate this problem into an LP model (Generate reports using solvers)