**Running on kant1.dat for greater than or equal to constraint**

**LP:**

selected pattern: x(9) = 1.66667 rolls

selected pattern: x(13) = 30 rolls

total waste = 0

total rolls = 31.67

**Rounding up:**

selected pattern: x(9) = 2 rolls

selected pattern: x(13) = 30 rolls

total waste = 0

total rolls = 32

**IP:**

selected pattern: x(9) = 1 rolls

selected pattern: x(12) = 20 rolls

selected pattern: x(13) = 10 rolls

total waste = 0

total rolls = 31

**Running on cs1.dat for greater than or equal to constraint:**

**LP:**

selected pattern: x(9) = 25.7 rolls

selected pattern: x(10) = 4.45 rolls

selected pattern: x(13) = 98.75 rolls

selected pattern: x(14) = 152.5 rolls

selected pattern: x(16) = 110.275 rolls

total waste = 0

total rolls = 391.68

**Rounding up:**

selected pattern: x(9) = 26 rolls

selected pattern: x(10) = 5 rolls

selected pattern: x(13) = 99 rolls

selected pattern: x(14) = 153 rolls

selected pattern: x(16) = 111 rolls

total waste = 0

total rolls = 394

**IP:**

selected pattern: x(9) = 26 rolls

selected pattern: x(10) = 125 rolls

selected pattern: x(11) = 1 rolls

selected pattern: x(12) = 2 rolls

selected pattern: x(13) = 99 rolls

selected pattern: x(14) = 153 rolls

selected pattern: x(16) = 49 rolls

total waste = 0

total rolls = 455

**Running on cs2.dat for greater than or equal to constraint:**

**LP:**

selected pattern: x(10) = 3.6 rolls

selected pattern: x(11) = 1.88068 rolls

selected pattern: x(13) = 9.8 rolls

selected pattern: x(15) = 5.375 rolls

selected pattern: x(16) = 9.09091 rolls

selected pattern: x(17) = 43.2424 rolls

selected pattern: x(18) = 7.66667 rolls

total waste = 0

total rolls = 80.66

**Rounding:**

selected pattern: x(10) = 4 rolls

selected pattern: x(11) = 2 rolls

selected pattern: x(13) = 10 rolls

selected pattern: x(15) = 6 rolls

selected pattern: x(16) = 10 rolls

selected pattern: x(17) = 44 rolls

selected pattern: x(18) = 8 rolls

total waste = 0

total rolls = 84

**IP:**

selected pattern: x(10) = 4 rolls

selected pattern: x(11) = 5 rolls

selected pattern: x(13) = 10 rolls

selected pattern: x(15) = 6 rolls

selected pattern: x(16) = 45 rolls

selected pattern: x(17) = 7 rolls

selected pattern: x(18) = 8 rolls

total waste = 0

total rolls = 85

**Running on cs3.dat for greater than or equal to constraint:**

**LP:**

selected pattern: x(13) = 4.66667 rolls

selected pattern: x(14) = 3.66667 rolls

selected pattern: x(15) = 6.66667 rolls

total waste = 0

total rolls = 15

**Rounding:**

selected pattern: x(13) = 5 rolls

selected pattern: x(14) = 4 rolls

selected pattern: x(15) = 7 rolls

total waste = 0

total rolls = 16

**IP:**

selected pattern: x(13) = 5 rolls

selected pattern: x(14) = 4 rolls

selected pattern: x(15) = 7 rolls

total waste = 0

total rolls = 16