**Week 2 Homework Assignment**

Q1. You have watched the lecture video titled “Introduction to Functional Specifications/Flowcharts (DEMS ii)” In the lecture (see the corresponding PPT slides), we have discussed the Example (i) where **trains transport the coal** to the deposit based on 2 and 8 days interarrival time and the trucks removes a load between 70 and 130 tons from the deposit.

We have generated 10 random numbers between 0 and 1 for INT and TOC, respectively.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **step** | **U(0,1) for INT** | **INT (days)** | **U(0,1) for TOC** | **TOC (tons)** |
| 1 | 0.0105 | 2 | 0.7640 | 110 |
| 2 | 0.7954 |  | 0.4044 |  |
| 3 | 0.4712 |  | 0.3382 |  |
| 4 | 0.6192 |  | 0.1644 |  |
| 5 | 0.3098 |  | 0.4089 |  |
| 6 | 0.7851 |  | 0.1261 |  |
| 7 | 0.6184 |  | 0.5083 |  |
| 8 | 0.6684 |  | 0.2897 |  |
| 9 | 0.9448 |  | 0.7686 |  |
| 10 | 0.1706 |  | 0.0760 |  |

**Table 1**. Uniformly distributed Random Numbers (0,1) for INT and TOC

1. Use the random numbers between 0 and 1 in Table 1 to generate INT and TOC in Table 1 based on the distribution tables of INT and TOC in the PowerPoint slide (This is called an **inversion technique** or an **Inverse Transform Procedure**). Fill Table 1 with your results (10 points)
2. Use the flow chart and complete the hand simulation 6 times using the INT and TOC calculated in (a) by filling out Table 2. For example, when the flow chart says ***“Generate INT***” you can use INT in the table according to its chronological order. (10 points)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **D** | **DOA** | **INT used** | **TOC used** | **PLI** | **CCT** |
| 0 |  |  |  |  |  |
| 1 |  |  |  |  |  |
| 2 |  |  |  |  |  |
| 3 |  |  |  |  |  |
| 4 |  |  |  |  |  |
| 5 |  |  |  |  |  |

Table 2. Hand Simulation Results.

Q2. Complete a flow chart of the last example in the lecture video (A car manufacturing problem). (20 Points). This is a very challenging problem, and I do not expect any complete work. Just do your best!