National University of Computer & Emerging Sciences, Karachi
Department of Computer Science
Assignment 2

Course Name: Simulation and Modelling	Course Code: CS4056
	Instructor Name: Shahid Ashraf
Semester: Spring	Section:

Complete the following problem in Arena Software and submit pdf report along with the working modal file. This is individual assignment, Also share your CPU details for verification of randomness and avoiding plagiarism.

A manufacturing system produces two types of electronic units: Part A and Part B. Part A is produced in an adjacent department, arrives every 5 minutes, and is processed with a TRIA(1, 4, 8) distribution. Part B arrives in batches of four every 30 minutes from a different building, and each individual part is processed with a TRIA(3, 5, 10) distribution. Both types of parts are then assembled, sealed, and tested. The process time for Part A follows a TRIA(1, 3, 4) distribution, and the process time for Part B follows a WEIB(2.5, 5.3) distribution. 91% of the parts pass inspection and are shipped immediately, while the remaining 9% are reworked. 80% of the reworked parts are salvaged and shipped, and the rest are scrapped. The time to rework a part is exponential with a mean of 45 minutes. The system is to be simulated for four consecutive 8-hour shifts (1,920 minutes), and statistics such as resource utilization, queue length, and cycle time are to be collected for shipped, salvaged, and scrapped parts in each area

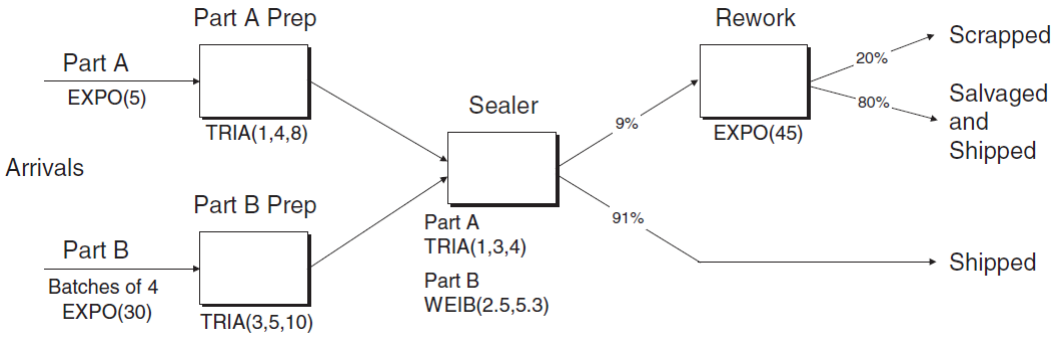
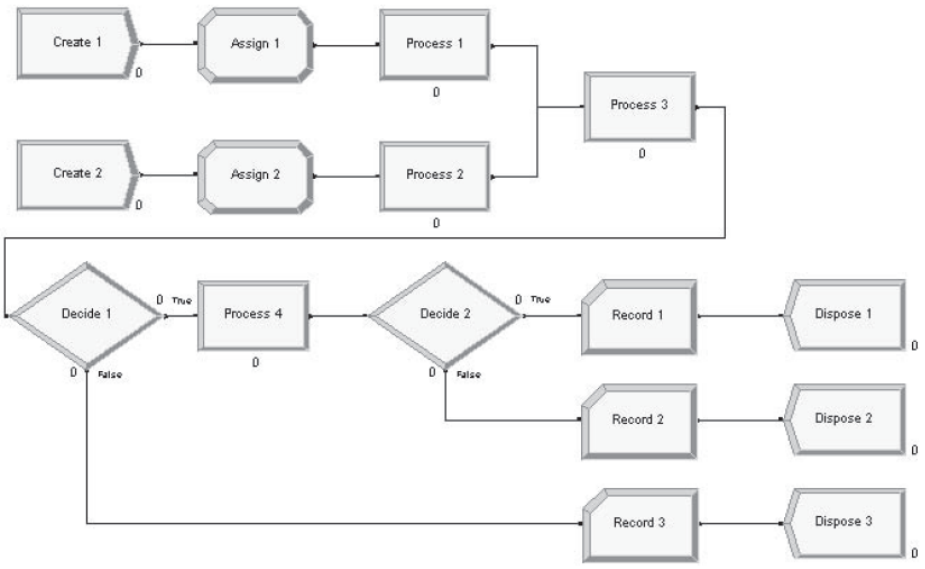
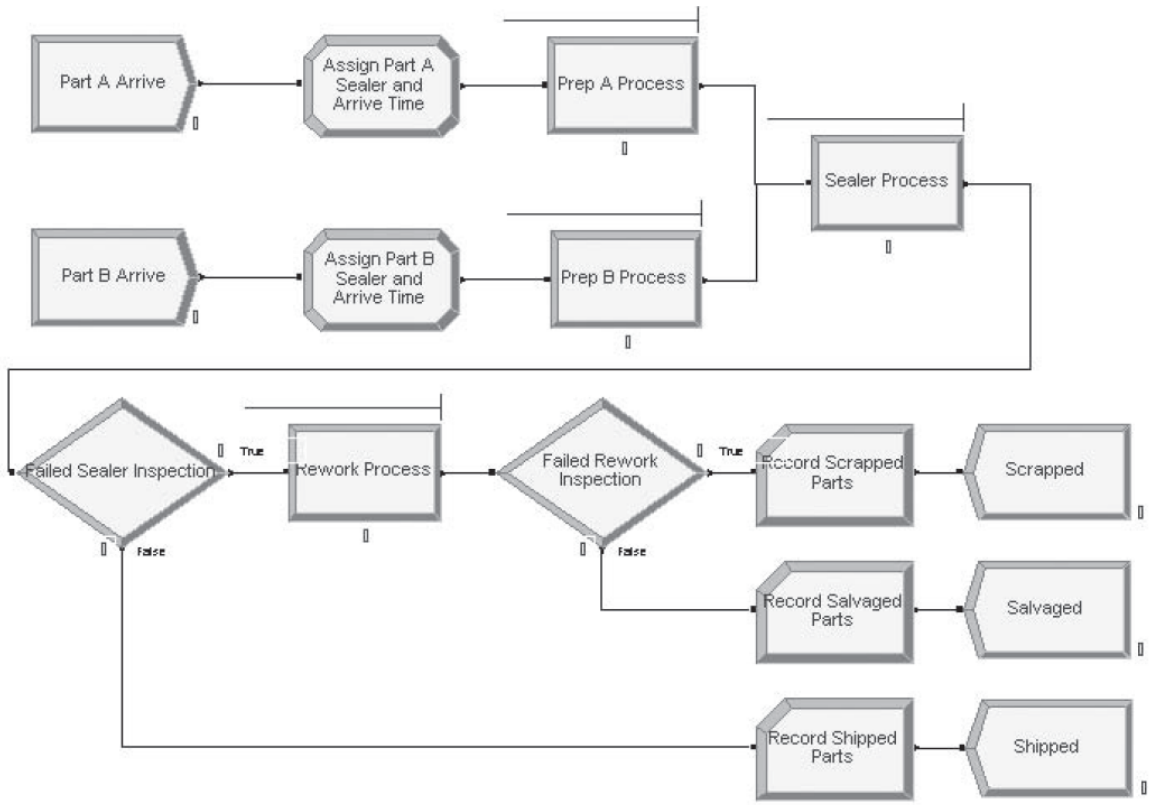


Figure 1: Process Flowchart





Name	Part A Arrive
Entity Type	Part A
Time Between Arrivals	
Type	Random (Expo)
Value	5
Units	Minutes

Display 4-1. The Completed Part A Create Dialog Box

Name	Part B Arrive
Entity Type	Part B
Time Between Arrivals	
Type	Random (Expo)
Value	30
Units	Minutes
Entities per Arrival	4

Display 4-2. The Completed Part B Create Dialog Box Entries

Name	Assign Part A Sealer and Arrive Time
Assignments:	
Type	Attribute
Attribute Name	Sealer Time
New Value	TRIA(1, 3, 4)
Type	Attribute
Attribute Name	Arrive Time
New Value	TNOW

Display 4-3. Assigning the Part A Sealer Time and Arrival Time

Name	Assign Part B Sealer and Arrive Time
Assignments:	
Type	Attribute
Attribute Name	Sealer Time
New Value	WEIB(2.5, 5.3)
Type	Attribute
Attribute Name	Arrive Time
New Value	TNOW

Display 4-4. Assigning the Part B Sealer Time and Arrival Time

Name	Prep A Process
Action	Seize Delay Release
Resources	
Type	Resource
Resource Name	Prep A
Quantity	1
Delay Type	Triangular
Units	Minutes
Minimum	1
Value (Most Likely)	4
Maximum	8

Display 4-5. Prep A Process Dialog Box

Name	Sealer Process
Action	Seize Delay Release
Resources	
Resource Name	Sealer
Quantity	1
Delay Type	Expression
Units	Minutes
Expression	Sealer Time

Display 4-6. The Sealer Dialog Box

Name	Failed Sealer Inspection
Percent True	9

Display 4-7. The Sealer Inspection Dialog Box

Name	Rework Process
Action	Seize Delay Release
Resources	
Resource Name	Rework
Quantity	1
Delay Type	Expression
Units	Minutes
Expression	EXPO(45)

Display 4-8. The Rework Process Dialog Box

Name	Failed Rework Inspection
Percent True	20

Display 4-9. The Rework Inspection Dialog Box

Figure 2: This part is just for the understanding of the problem and its implementation in arena, This is not the complete solution