Independent University, Bangladesh (IUB)

Course No.:	CSC301	Year:	2021
Section No.:	03	Semester:	Spring
Course Title:	Finite Automata & Theory of Computation	Exam:	Assignment 02
Instructor:	M Ashraful Amin, PhD	Total Marks:	10
School:	SETS	Due Date:	
Department:	CSE	Location:	Online

Name: ID:

In this programing assignment you are assigned to implement basic concepts of sets assume that the sets contain integer numbers within the range [0 9]. You must implement the following as computer programs, do not use any predefine libraries. The preferred languages are C++ or Java.

Use the implementation from assignment 01 and use those functions to implement the following

1. Say user wants you to calculate the following: (AUC) ∩ (AUD) for the sets
   A = {1, 3, 5, 2}, B = {1, 4, 6, 8, 5}, C = {1, 4, 6, 8}, D = {1, 2, 6, 10}

2. Write a function that calculates the power set.
   For example, is the set A = {1, 3, 2} is input the output of the function should be
   {ϕ, {1}, {3}, {2}, {1,3}, {1,2}, {3,2}, {1,3,2}}

3. Given two sets A = {1, 3}, B = {a, b, f} calculate the cartesian product or cross product , the output should be: A x B = { (1,a), (1,b), (1,f), (3,a), (3,b), (3,f) }

4. Write a code to test the following concept for the given sets A = {1, 3, 5, 2}, B = {1, 4, 6, 8, 5}
   Commutative property of set states that A U B = B U A also A ∩ B = B ∩ A

5. Write a code to test the following concept for the given sets A = {1, 3, 5, 2}, B = {1, 4, 6, 8, 5}, C = {1, 4, 6, 8},
   Associative property of set states that (A U B) U C = A U (B U C) also (A ∩ B) ∩ C = A ∩ (B ∩ C)

6. Write a code to test the following concept for the given sets A = {1, 3, 5, 2}, B = {1, 4, 6, 8, 5}, C = {1, 4, 6, 8},
   Distributive property of set states that A U (B ∩ C) = (A U B) ∩ (A U C) also A ∩ (B U C) = (A ∩ B) U (A ∩ C)