CS 201 (David Gerhard): Introduction to Digital Systems


David Gerhard

a3

Submit to urcourses, in PDF, DOC(X), or text format. PDF is preferred. Be sure to follow all assignment expectations.

Question 1

Imagine a new kind of flip-flop called a J N flip-flop which has two inputs J and N. Input J behaves like the J input of the J K flip-flop, and input N behaves like the complement of the K input of a J K flip-flop (N=K').

1. Derive the characteristic table and excitation table of the J N flip-flop.
2. Show that a D flip-flop can be constructed from a J N flip-flop by connecting its two inputs (J and N) together.

Question 2

Design a sequential circuit with two JK flip flops and two inputs E and x. when E=0, the circuit holds its state. when E=1 and x=1 the circuit repeatedly counts through 0,2,3,1. when E=1 and x=0, the circuit repeatedly counts through 0,1,3, 2. Implement and test this circuit using LogicWorks.

Question 3

Design a sequential circuit to control a gumball machine. Gumballs are 15 cents each. The machine accepts nickels (N) or dimes (D). The machine should be able to indicate when a gumball should be dispensed (G) and whether or not change is given at that time (C). Follow the sequential design procedures set out in the course. Implement and test this circuit using LogicWorks. Specifically, show what happens when a user inserts 2 dimes, and what happens when a user inserts 3 nickels.

Assignment deliverables:

all files must have the indicated filenames (replace 200200000 with your student number):

1. Assignment file named "A3_200200000.docx" or "A3_200200000.pdf" containing your complete solution for Question 1 and your design process, circuit images, and annotated timing diagrams for Questions 2 and 3.

2. Circuit file named "A3Q2_200200000.cct" containing your implemented circuit for Question 2.

3. Circuit file named "A3Q3_200200000.cct" containing your implemented circuit for Question 3.

Submission status

Submission status	Submitted for grading
Grading status	Graded
Due date	Saturday, 15 October 2016, 11:55 PM
Time remaining	Assignment was submitted 3 hours 10 mins early
Last modified	Saturday, 15 October 2016, 8:44 PM
File submissions	A3_200312488.pdf A3Q2_200312488.cct A3Q3_200312488.cct
Submission comments	Comments (0)

Feedback

Grade	19.00 / 30.00
Graded on	Tuesday, 25 October 2016, 2:05 PM
Graded by	 Zhi Cao
Annotate PDF	Mandeep Singh_667893_0.pdf View annotated PDF...

Navigation
Administration

Navigation

Administration

Course administration