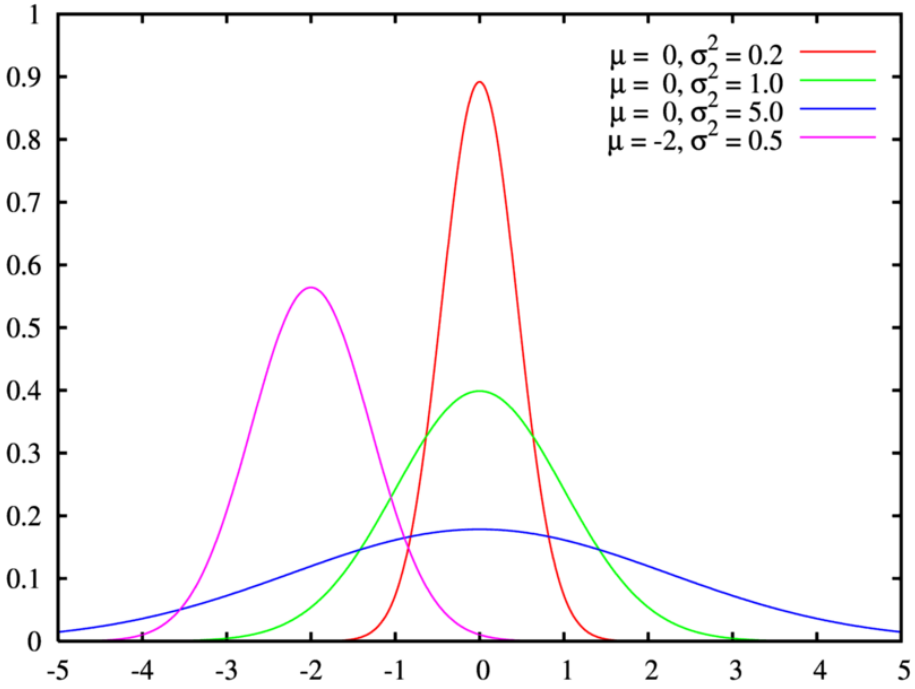
Recitation Guide Monday, July 15

1. House Keeping
    a. Practice Exam 2
        i. http://coweb.cc.gatech.edu/cs1316/uploads/71/PracticeExam2Summer07-v1-dsf.3.pdf
    b. Exam 2
        i. Held Wednesday, July 17 during lecture
        ii. Bring buzzcards!
        iii. Review session
            1. When: Tuesday, July 18 6pm-8pm
            2. Where: CoC 102
            3. Topic(s): Practice Exam 2, Exam 2, Homework 8 (if necessary)
    c. Extra Credit Homework 9
        i. Soon to be released.
        ii. Will be an individual assignment with limited help from TAs.
    d. Extra Optional Quiz
        i. July 23 and July 25 during recitation.
        ii. If grade is higher than lowest quiz grade, then this grade replaces lowest quiz grade.
        iii. Topics likely to be highly comprehensive.
    e. Final Exam
        i. Held Wednesday 2:50pm (←still checking on this)
    f. Homework 8
        i. http://coweb.cc.gatech.edu/cs1316/633#hw8
        ii. Due Wednesday, July 17 11:45pm with grace until Thursday, July 18 7:00am.
        iii. Cannot be pushed back more!
        iv. Feel free to tweak some of the numbers.
        v. Importing into Excel
            1. Have the Simulation write to a textfile delimitating each entry with a tab.
            2. Open Microsoft Excel and open the tab-delimited file.
            3. Follow the instructions in Excel and graph.
2. DES (Discrete Event Simulations)
    a. Remember that:
        i. In discrete simulations not every moment in time is simulated.
        ii. Queues are FIFO (First in, First out) structures.
    b. The EventQueue
        i. Because there is no time loop, time events need to be placed in the **EventQueue**, where the first one removed (processed) is the event that occurs the earliest in time. At each run step, the next scheduled event with the lowest

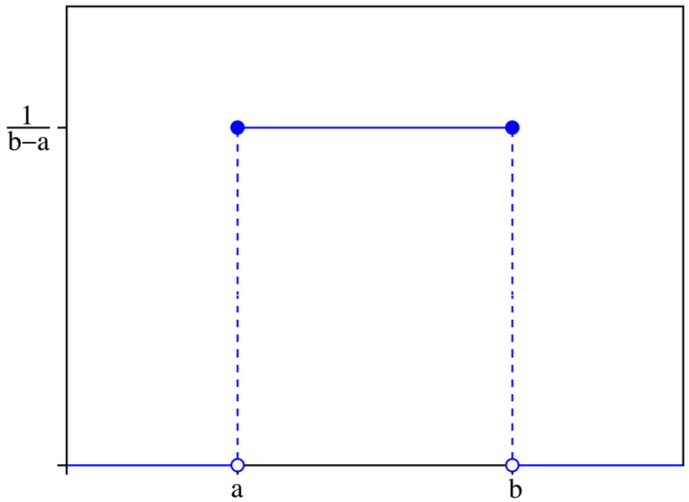
time gets processed. The current time is then that time, the time that that event is supposed to occur.

c. Agents
   i. In a discrete event simulations, agents do not act(). Instead, the agents wait for events to occur and schedule new events to correspond to the next thing that they are going to do. Events also get scheduled according to different probabilities.
   ii. However, agents cannot always do what they want to do because of limited resources. An agent is **blocked** until more resource is available.

d. Uniform distributions versus normal distributions
   i. Normal distribution (Gaussian or the bell curve)



   ii. Uniform distribution



e. Insertion Sort
    i. How it works
        1. The insertion sort algorithm sorts a list of values by repetitively inserting a particular value into a subset of the list that has already been sorted. One at a time, each unsorted element is inserted at the appropriate position in that sorted subset until the entire list is in order. Each time an insertion is made, the number of values in the sorted subset increases by one. The insertion process requires that the other values in the array shift to make room for the inserted element.
    ii. Needed to insert new events into the EventQueue in the correct order.
    iii. Big O
        1. Best case: n (for an already sorted list)
        2. Worst case: n^2 (for a list sorted in reverse order)
    iv. Example

        [ ] 9 2 1 3 5 10 4 7 8 6, where [sorted list] unsorted list
        1. [9] 2 1 3 5 10 4 7 8 6
        2. [2 9] 1 3 5 10 4 7 8 6
        3. [1 2 9] 3 5 10 4 7 8 6
        4. [1 2 3 9] 5 10 4 7 8 6
        5. [1 2 3 5 9] 10 4 7 8 6
        6. [1 2 3 5 9 10] 4 7 8 6
        7. [1 2 3 4 5 9 10] 7 8 6
        8. [1 2 3 4 5 7 9 10] 8 6
        9. [1 2 3 4 5 7 8 9 10] 6
        10. [1 2 3 4 5 6 7 8 9 10]
    v. Other sorts
        1. Bubble sort, selection sort, insertion sort, radix sort, heap sort, quick sort, merge sort.
        2. Only responsible for insertion sort in this course.

3. Homework 8 questions? Issues?