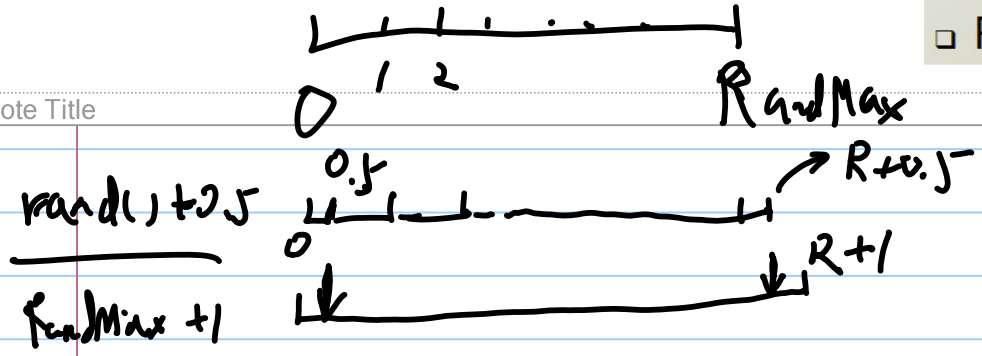
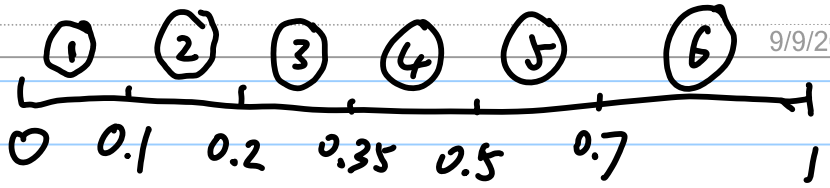
Note Title 9/9/2013

- P(1)=0.1; P(2)=0.1; P(3)=0.15; P(4)=0.15
- P(5)=0.2; P(6)=0.3





$$X = \begin{cases} x_0 & \text{if } U < p_0 \\ x_1 & \text{if } p_0 \le U < p_0 + p_1 \\ \vdots & \\ x_j & \text{if } \sum_{i=0}^{j-1} p_i \le U < \sum_{i=0}^{j} p_i \\ \vdots & \end{cases}$$

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```
X = zeros(1000,1);
for i=1:1000
    u = rand;
    if (u<0.1) X(i)=1;
    else if (u<0.2) X(i)=2;
    else if (u<0.35) X(i)=3;
    else X(i)=6;
end
```

10 samples of dice #1

1, 3, 4, 6, 6, 5, 3, 4, 6, 5

$P(X=1)=\frac{1}{10}$, $P(X=2)=0$, $P(X=3)=\frac{2}{10}$

$x = 0.5$ $\quad F(0.5) = P(X \le 0.5) = 0.3$

$P(U \le F(0.5)) = P(U \le 0.3) = 0.3 = F(0.5)$

$$F(x) = 1 - e^{-\lambda x}$$

$y = 1 - e^{-\lambda x}$ $\quad x = ?$

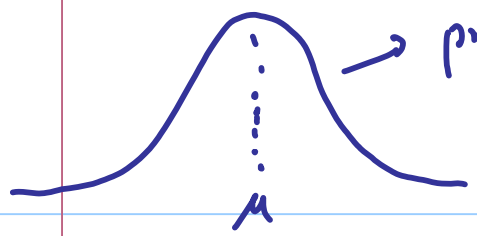
$\Rightarrow e^{-\lambda x} = 1 - y \Rightarrow -\lambda x = \ln(1-y)$

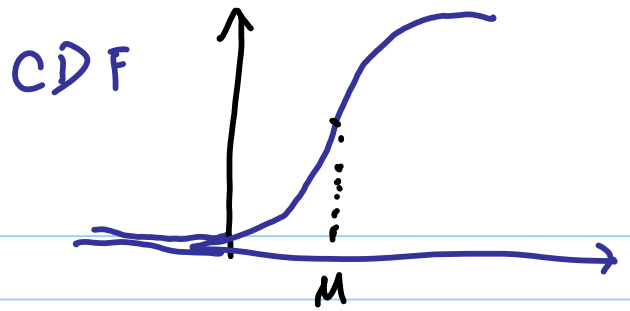
$\Rightarrow x = -\frac{1}{\lambda}\ln(1-y)$

$F^{-1}(x) = -\frac{1}{\lambda}\ln(1-x)$

$U \longrightarrow X = -\frac{1}{\lambda}\ln(1-u)$

```
X = zeros(1000,1);
for i = 1:1000,
    u = rand;
    X(i) = -log(1-u)/λ;
end
```


prob. density fun
μ


CDF
μ