demo_accept-reject

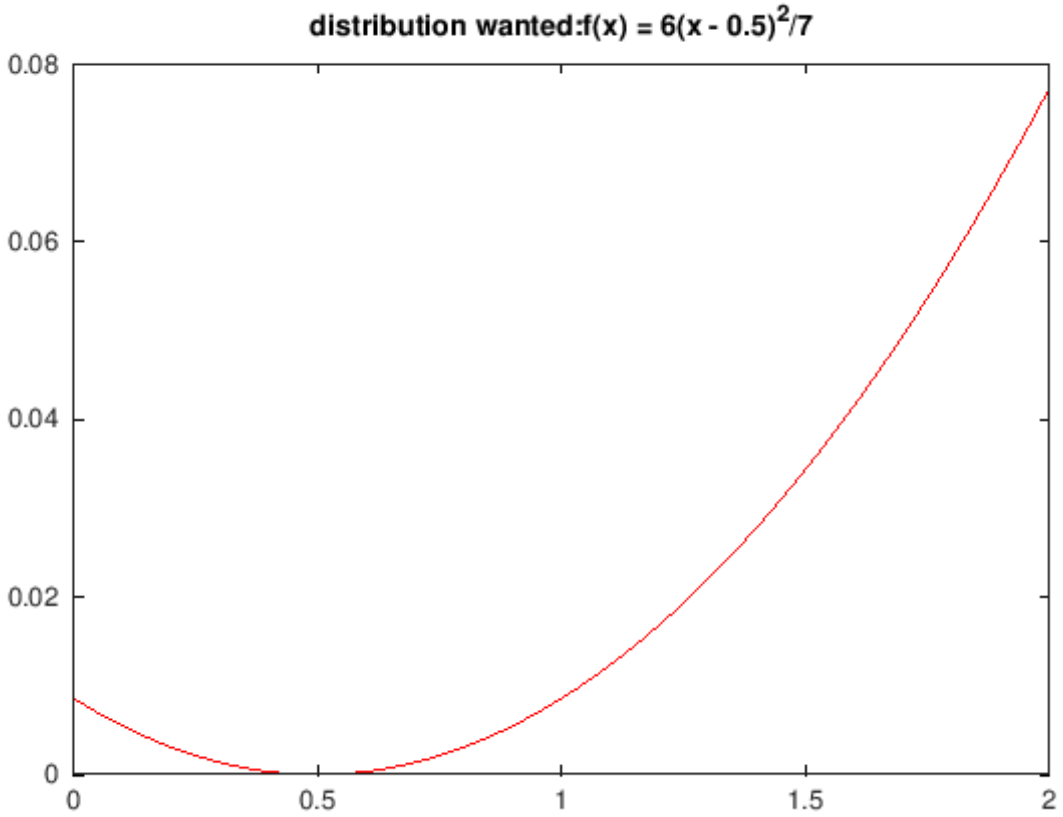
October 18, 2023

[9]:

[8]:
```
graphics_toolkit('gnuplot');
```

$$f(x) = 6(x-0.5)^2/7$$

[27]:
```
t = 0:0.04:2;
z = 6 * (t - 0.5).^2 / 7;
scale = 2/50;
plot(t, scale * z, 'r');
title('distribution wanted:f(x) = 6(x - 0.5)^2/7')
```



[ ]:

Let us do it!

[ ]:
```
N = 500000;
```

0.1 1. “ ”

[2]:
```
pkg load statistics;
Y = unifrnd(0, 2, 1, N);
```

[ ]:
```
fy = 6 * (Y - 0.5).^2 / 7;
```

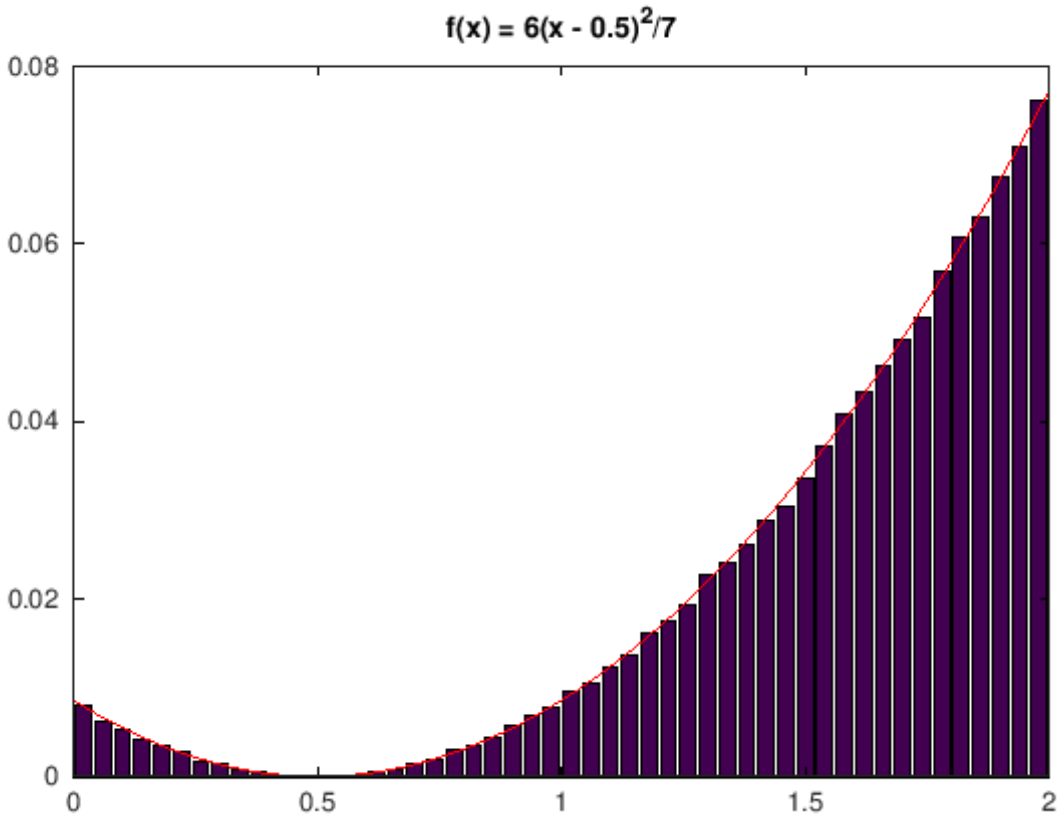
[3]:
```
U = unifrnd(0, 1, 1, N);
```

[ ]:
```
gy = 0.5;    M = 3.858;
X = Y(U < fy ./ gy/ M);
```

[ ]:

[7]:
```
sample = length(X);
[Xnumber, Xcenters] = hist(X, 50);
bar(Xcenters, Xnumber / sample);
title("f(x) = 6(x - 0.5)^2/7");

hold on;  plot(t, scale * z, 'r');  hold off;
```



[5]:
```
rate = sample / N
```

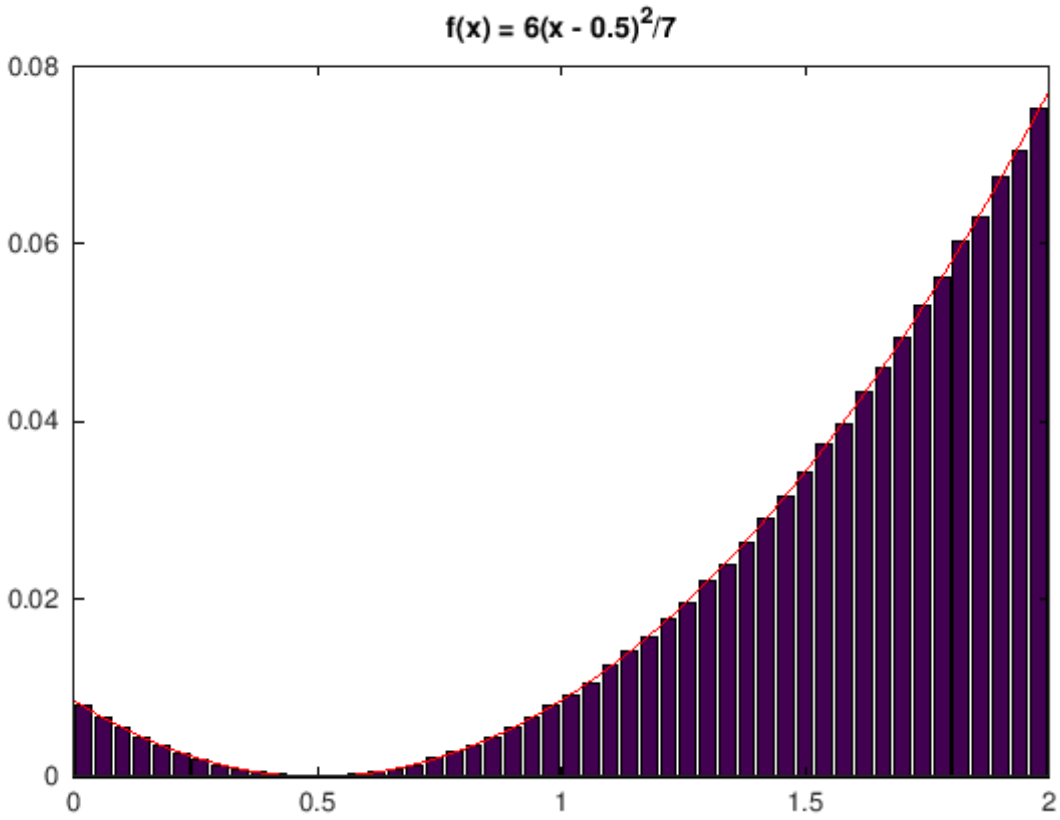
```
rate = 0.2594
```

0.2 2.

[14]:
```
fy = 6 * (Y - 0.5).^2 / 7;
```

[15]:
```
T = 7/2 * unifrnd(0, 1, 1, N) - 0.5^3;
Y = sign(T) .* abs(T) .^ (1/3) + 0.5;
```

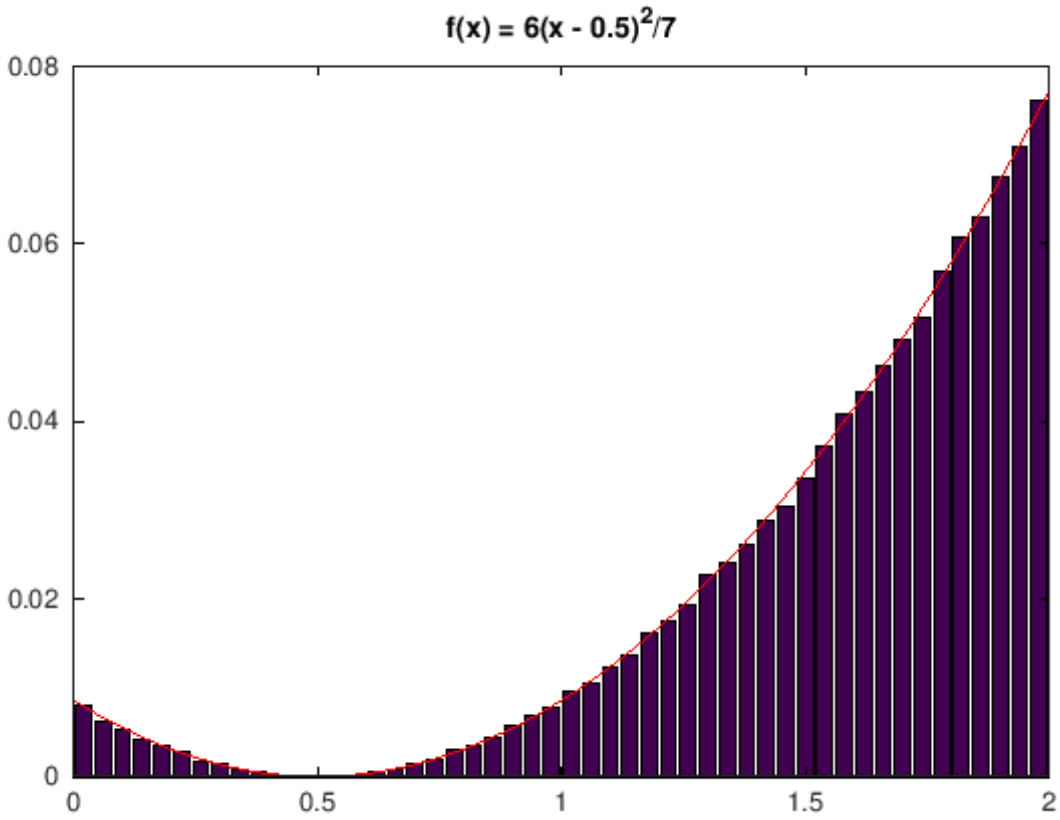
[23]:
```
bins = 50;
[Xnumber, Xcenters] = hist(Y, bins);
bar(Xcenters, Xnumber / N);
title("f(x) = 6(x - 0.5)^2/7");
hold on;
t = 0:0.04:2;
z = 6 * (t - 0.5).^2 / 7;
scale = 2/50;
plot(t, scale * z, 'r');
hold off;
```



[16]:
```
M = 1.01;
gy = 6 * (Y - 0.5).^2 / 7;
```

[17]:
```
U = unifrnd(0, 1, 1, N);
X = Y(U < fy ./ gy / M);   % ???
```

[21]:
```
bins = 50;   sample = length(X);
[Xnumber, Xcenters] = hist(X, bins);
bar(Xcenters, Xnumber / sample);
title("f(x) = 6(x - 0.5)^2/7");
hold on;
t = 0:0.04:2;
z = 6 * (t - 0.5).^2 / 7;
scale = 2 / bins;
plot(t, scale * z, 'r');
hold off;
```



[22]:
```
rate = sample / N
```

```
rate = 0.2594
```

[ ]:

0.3 3.

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