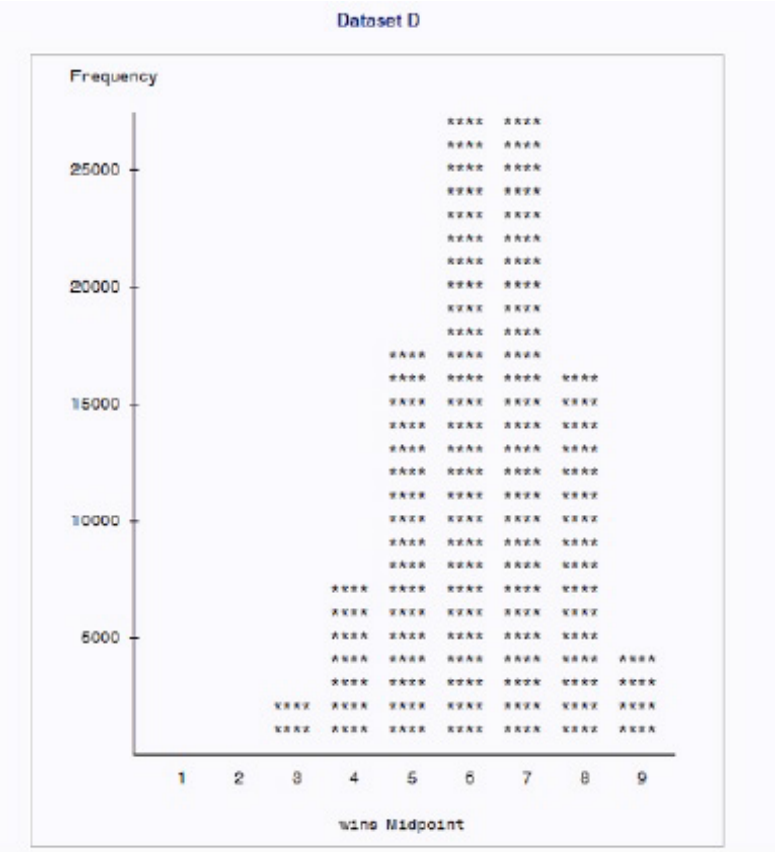
WST 211: Practical 3 MEMORANDUM

Question 1: SAS Program:

```
data d;
do i=1 to 100000;
wins=ranbin(7896,9,0.7);
if wins<=5 then GrpA=1; else GrpA=0;
if 3<=wins<=7 then GrpB=1; else GrpB=0;
output;
end;

options nodate linesize=70 pagesize=40 center;
proc chart data=d;
vbar wins / midpoints=1 2 3 4 5 6 7 8 9;
title 'Dataset D';
run;

options pagesize=60 nocenter;
proc freq data=d;
tables wins;
run;

proc means data=d;
var GrpA GrpB wins;
run;
```

1. See SAS program.

   (a) **Figure:** Bar chart of the number of Wins



   (b) **SAS Output:**

wins	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	0.00	2	0.00
1	45	0.05	47	0.05
2	346	0.35	393	0.39
3	2108	2.11	2501	2.50
4	7308	7.31	9809	9.81
5	17026	17.03	26835	26.84
6	26854	26.85	53689	53.69
7	26622	26.62	80311	80.31
8	15690	15.69	96001	96.00
9	3999	4.00	100000	100.00

$p(x) = P(X = x)$
$p(0) = 0.0000$
$p(1) = 0.0005$
$p(2) = 0.0035$
$p(3) = 0.0211$
$p(4) = 0.0731$
$p(5) = 0.1703$
$p(6) = 0.2685$
$p(7) = 0.2662$
$p(8) = 0.1569$
$p(9) = 0.0400$

(c)

i. $P(X \leq 5) = 0.2684$ (See SAS Output)

ii. $P(3 \leq X \leq 7) = 0.8031 - 0.0039 = 0.7992$ (See SAS Output)

iii. Expected value $0(0.0000) + 1(0.0005) + 2(0.0035) \cdots + 9(0.0400) = 6.3043$

(d) **SAS Output:**

```
The MEANS Procedure
Variable          N            Mean         Std Dev
GrpA         100000       0.2683500       0.4431030
GrpB         100000       0.7991800       0.4006157
wins         100000       6.3041200       1.3714554
```

i. $P(X \leq 5) = 0.2684$ (See SAS Output)

ii. $P(3 \leq X \leq 7) = 0.7992$ (See SAS Output)

iii. Expected value $= 6.3041$ (See SAS Output)

Question 2: SAS Program:

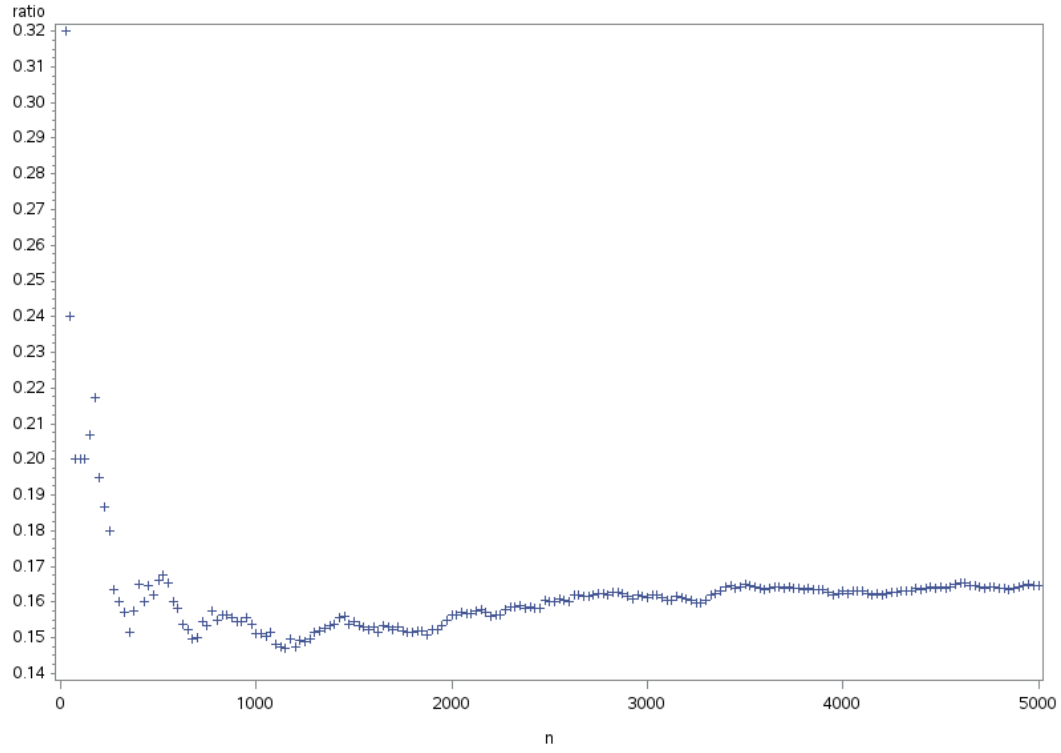
(a)

```
data dice;
count=0;
do i=1 to 200;
do j=1 to 25;
x=ranuni(72);
if x > 4/6 and x <= 5/6 then count=count+1;
end;
n=i*25;
ratio=count/n;
output;
end;
proc gplot data=dice;
plot ratio*n;
run;
```

2.

(b)

Plot of ratio against number of rolls:



Yes, it supports the frequency limit definition, as n increases the ratio converges to 1/6.