

APPENDIX B

MINITAB MACROS

To find coverage proportion and average width
of SB confidence interval for Cp:

cp3.mtb

```
let k3=1.6449
let k5=0
let k11=1
exec 'cp2'400
sort c4 c4
sort c5 c5
print k5
end
```

cp2.mtb

```
random 60 c1;
norm 0 k1.
let k2=1
exec 'cp1'1000
let c4(k11)=2/(3*stdev(c1))-k3*stdev(c3)
let c5(k11)=2/(3*stdev(c1))+k3*stdev(c3)
let k4=c5(k11)-c4(k11)
let k5=k5+k4/400
let k11=k11+1
end
```

cp1.mtb

```
sample 60 c1 c2;
repl.
let c3(k2)=2/(3*stdev(c2))
let k2=k2+1
end
```

To find coverage proportion and average width
of Bissell's confidence interval for Cpk:

cpk2.mtb

```
let k5=0
let k11=1
exec 'cpk1'3000
let k6=k5/3000
print k6
sort c3 c3
sort c4 c4
end
```

cpk1.mtb

```
random 60 c1;
norm k1 k2.
let k3=(3-abso(mean(c1)))/(3*stdev(c1))
let c3(k11)=k3-1.6449*sqrt(1/540+k3*k3/118)
let c4(k11)=k3+1.6449*sqrt(1/540+k3*k3/118)
let k4=c4(k11)-c3(k11)
let k5=k5+k4
let k11=k11+1
end
```

To find coverage proportion and average width
of SB confidence interval for Cpk:

cpk5.mtb

```
let k3=1.6449
let k5=0
let k11=1
exec 'cpk4'400
sort c4 c4
sort c5 c5
print k5
end
```

cpk4.mtb

```
random 60 c1;
norm k1 k10.
let k2=1
exec 'cpk3'1000
let c4(k11)=(3-abso(mean(c1)))/(3*stdev(c1))-k3*stdev(c3)
let c5(k11)=(3-abso(mean(c1)))/(3*stdev(c1))+k3*stdev(c3)
let k4=c5(k11)-c4(k11)
let k5=k5+k4/400
let k11=k11+1
end
```

cpk3.mtb

```
sample 60 c1 c2;
repl.
let c3(k2)=(3-abso(mean(c2)))/(3*stdev(c2))
let k2=k2+1
end
```

To find coverage proportions and average widths of the confidence intervals for Cpm, based on normality:

cpm2.mtb

```
let k11=1
let k5=0
let k7=0
exec'cpm1'2500
sort c4 c4
sort c5 c5
sort c7 c7
sort c8 c8
print k5
print k7
end
```

cpm1.mtb

```
random 60 c1;
norm k1 k10 .
let k2=1/sqrt(1/60*sum(c1*c1))
let k12=60*mean(c1)/(59*stdev(c1))
let c3(1)=60*(1+k12*k12)*(1+k12*k12)/(1+2*k12*k12)
roun c3 c3
let k3=c3(1)
invcdf .05 c20;
chis k3.
invcdf .95 c21;
chis k3.
let c4(k11)=k2*sqrt(c20/k3)
let c5(k11)=k2*sqrt(c21/k3)
let k4=c5(k11)-c4(k11)
let k5=k5+k4/3000
let c7(k11)=k2-k2*1.6449*sqrt(.5/k3)
let c8(k11)=k2+k2*1.6449*sqrt(.5/k3)
let k6=c8(k11)-c7(k11)
let k7=k7+k6/3000
let k11=k11+1
end
```

To find coverage proportion and average width
of SB confidence interval for Cpm:

cpm5.mtb

```
let k3=1.6449
let k5=0
let k11=1
exec 'cpm4'400
sort c4 c4
sort c5 c5
print k5
end
```

cpm4.mtb

```
random 60 c1;
norm k1 k10.
let k2=1
exec 'cpm3'1000
let c4(k11)=1/sqrt(1/60*sum(c1*c1))-k3*stdev(c3)
let c5(k11)=1/sqrt(1/60*sum(c1*c1))+k3*stdev(c3)
let k4=c5(k11)-c4(k11)
let k5=k5+k4/400
let k11=k11+1
end
```

cpm3.mtb

```
sample 60 c1 c2;
repl.
let c3(k2)= 1/sqrt(1/60*sum(c2*c2))
let k2=k2+1
end
```