Example of simple cylinder (using variables)

http://engr.wallawalla.edu/engr480/examples/ex20120325vars.ngc

```
%
O0325; (SIMPLE CYLINDER EXAMPLE 2012-03-25)
; (STOCK- ALUM 1.5IN X 19MM + 10MM)
; (FINISHED PART IS 25.4MM OD X 18.5MM
LONG)
; (TOOLS-)
; (T1- CNMG 80DEG DIAMOND)
; (T2- VNMG 15DEG DIAMOND)
; (T10- 3.175MM CUTOFF)

; (VARIABLES)
#500=38.1    (STOCK DIAM)
#501=18.5    (STOCK LEN)
#502=150.0   (SURFACE M/MIN)
#503=0.2     (ROUGH FEED M/REV)
#504=0.05    (FINISH FEED M/REV)
#510=25.4    (FINISH OD)

; (FACE WITH CNMG)

G00 T0101          (SELECT TOOL 1)
G50 S1000          (MAX SPEED 1000RPM)
G96 S#502          (SET CONST SURFACE
SPEED)
G99                (FEED PER REV)
M03                (TURN ON SPINDLE)
G00 Z#501          (MOVE TO PLANE OF FACE)
G00 X[#500+1.0]    (MOVE CLOSE TO STOCK OD)
M08                (TURN ON COOLANT)
G01 X-0.1 F#503    (FACE DOWN TO CENTER)
G01 Z[#501+1.0] F1.0    (BACK OFF)
M09                (TURN OFF COOLANT)
M05                (TURN OFF SPINDLE)
G28 U0 W0          (GO HOME)
M01                (WAIT FOR START BUTTON)

; (ROUGH TURN OD WITH CNMG)

G00 T0101
G50 S2000
G96 S#502
G99
G00 X[#500 + 10.0] Z[#501+10.0] (GET CLOSE)
M03
G00 X34.1 Z[#501 + 2.5]    (INITIAL POINT)
M08

G01 Z-3.2 F#503          (PASS 1)
G01 X[#500+2.0] F#503
G00 Z[#501 + 2.5]
G00 X30.1G01 Z-3.2 F#503 (PASS 2)
G01 X[#500+2.0] F#503
G00 Z[#501 + 2.5]
G00 X26.1
G01 Z-3.2 F#503          (PASS 3)
G01 X[#500+2.0] F#503
G00 Z[#501 + 2.5]
M09
M05
G28 U0 W0
M01

; (FINISH TURN WITH VNMG)

G00 T0202
G50 S2000
G96 S#502
G99
G00 X[#500+10.0] Z[#501+10.0]  (GET CLOSE)
M03
G00 X[#500] Z[#501 + 2.5]   (INITIAL POINT)
M08
G00 X25.4
G01 Z-3.2 F#504
G01 X[#500+2.0] F#504
G00 Z[#501 + 2.5]
M09
M05
G28 U0 W0
M01

; (CUTOFF)

G00 T1010
G50 S1000
G96 S#502
G00 Z-3.175
G00 X[#500 + 2.0]
M03
M08
G01 X-0.4 F0.05
G01 X[#500+2.0] F4.0
M09
M05
G28 U0 W0
M30
%
```

Example of simple cylinder (without variables)
http://engr.wallawalla.edu/engr480/examples/ex20120325novar.ngc

```
%
O0325; (SIMPLE CYLINDER EXAMPLE 2012-03-25)
; (STOCK- ALUM 1.5IN X 19MM + 10MM)
; (FINISHED PART IS 25.4MM OD X 18.5MM
LONG)
; (TOOLS-)
; (T1- CNMG 80DEG DIAMOND)
; (T2- VNMG 15DEG DIAMOND)
; (T10- 3.175MM CUTOFF)

; (FACE WITH CNMG)

G00 T0101          (SELECT TOOL 1)
G50 S1000          (MAX SPEED 1000RPM)
G96 S150           (SET CONST SURFACE SPEED)
G99                (FEED PER REV)
M03                (TURN ON SPINDLE)
G00 Z18.5          (MOVE TO PLANE OF FACE)
G00 X39.0          (MOVE CLOSE TO STOCK OD)
M08                (TURN ON COOLANT)
G01 X-0.1 F0.2     (FACE DOWN TO CENTER)
G01 Z19.5 F1.0     (BACK OFF)
M09                (TURN OFF COOLANT)
M05                (TURN OFF SPINDLE)
G28 U0 W0          (GO HOME)
M01                (WAIT FOR START BUTTON)

; (ROUGH TURN OD WITH CNMG)

G00 T0101
G50 S2000
G96 S150
G99
G00 X48.0 Z28.0          (GET CLOSE)
M03
G00 X34.1 Z21.0          (INITIAL POINT)
M08

G01 Z-3.2 F0.2          (PASS 1)
G01 X40.0 F0.2
G00 Z21.0
G00 X30.1
G01 Z-3.2 F0.2          (PASS 2)
G01 X40.0 F0.2
G00 Z21.0
G00 X26.1
G01 Z-3.2 F0.2          (PASS 3)
G01 X40.0 F0.2
G00 Z21.0
M09
M05
G28 U0 W0
M01

; (FINISH TURN WITH VNMG)

G00 T0202
G50 S2000
G96 S150
G99
G00 X48.0 Z28.0        (GET CLOSE)
M03
G00 X38.1 Z21.0        (INITIAL POINT)
M08
G00 X25.4
G01 Z-3.2 F0.05
G01 X40.0 F0.05
G00 Z21.0
M09
M05
G28 U0 W0
M01

; (CUTOFF)

G00 T1010
G50 S1000
G96 S150
G00 Z-3.175
G00 X40.0
M03
M08
G01 X-0.4 F0.05
G01 X40.0 F4.0
M09
M05
G28 U0 W0
M30
%
```

Notes on preparing programs for the Mori Seiki Duraturn lathe ENGR480 2012-03-25

1. Use only upper case letters. All lower case letters will be ignored by the control.

2. Begin and end program with '%' character.

3. Second line of program should be Oabcd where abcd is a four digit number.

4. Comments are enclosed in parentheses.

5. All coordinates values should have a decimal point.

6. File must be saved as plain text file (not .doc or other word processor format).

7. Copy file to z: drive, naming it 'moricode.txt' (do this just before loading it in the lathe).

Assignment for Lab 2012-03-27

Write a program to machine the part below on the Mori Seiki lathe. You may use the supplied program as a template if you wish. Your program should face the part, rough turn, finish turn, and cutoff the part.