



# Main program

```
>> cd IntroductionOctave/  
>> mkdir Program/  
ans = 1  
>> cd Program/  
>> edit callPlot.m  
>> |
```

Command Window

GUI

```
1 %% Definition du programme:  
2  
3 % programme principal:  
4 % choix:  
5 % 1- explication du programme  
6 % 2- definir les limites de la figure  
7 % 3- dessiner un ellipse defini par l'utilisateur  
8 % 4- charger le fichier des ellipses et les dessiner  
9 % 5- demander la precision du dessin, par d'faut 200 points;  
10 % 6- nettoyer la figure  
11 % 7- sortir  
12  
13 % consignes:  
14 % - organiser le programme  
15 % - sauvegarder le programme principal dans un script  
16 % - utiliser des fonctions dans une fichier .m  
17 % - documenter les fonctions et le programme principal  
18  
19 clear all;  
20 close all;  
21  
22 choice = 1;  
23  
24 choice = |  
25
```

MATLAB and Octave for beginners

Before writing our functions and script for the main program, we have to create a directory for this program. First I change into my introduction octave directory and then I create a new directory which I call program, so 'mkdir program'. Then I change into this directory. Cd program. So MATLAB or octave, we look for the functions first in this directory and then elsewhere in it's path. I can start my script and start editing my script. So I do edit 'callPlot'. This is the name of the function, sorry, of the script that I want to build. I have to add a dot m. Here it is and I already added all the functionalities that are required by the exam. So there is the definition of the program and all the things that we need to do. I will write the program just after here. I clear all the variables so that I know that there is nothing left in my environment and I also close all the figures. We need also to enter a choice. And this has to be done by the user and I will use the same numbers as in the description that it will be 1 for the explanation of the program until 7 which says that we want to exit. So for the choice 1, I would like the user to have an explanation of the program.

Notes

Summary



0m 04s

# Main program

```
>> cd IntroductionOctave/  
>> mkdir Program/  
ans = 1  
>> cd Program/  
>> edit callPlot.m  
>> callPlot  
Fait ton choix  
  
[ 1] explique  
[ 2] change les axes  
[ 3] dessine un ellipse  
[ 4] dessine les ellipse dans l  
e fichier  
[ 5] change la precision  
[ 6] nettoie la figuer  
[ 7] sort du programme  
  
pick a number, any number: 2  
>> choice  
choice = 2  
>> |
```

Command Window

GUI

```
2  
3 % programme principal:  
4 % choix:  
5 % 1- explication du programme  
6 % 2- definir les limites de la figure  
7 % 3- dessiner un ellipse defini par l'utilisateur  
8 % 4- charger le fichier des ellipses et les dessiner  
9 % 5- demander la precision du dessin, par d'faut 200 points;  
10 % 6- nettoyer la figure  
11 % 7- sortir  
12  
13 % consignes:  
14 % - organiser le programme  
15 % - sauvegarder le programme principal dans un script  
16 % - utiliser des fonctions dans une fichier .m  
17 % - documenter les fonctions et le programme principal  
18  
19 clear all;  
20 close all;  
21  
22 choice = 1;  
23  
24 choice = menu('Fait ton choix','explique', 'change les axes', ...  
25 'dessine un ellipse', 'dessine les ellipse dans le fichier', ...  
26 'change la precision', 'nettoie la figuer', 'sort du programme');  
27  
28
```

MATLAB and Octave for beginners

But in general, we need to give the possibility possibility to the user to choose what he want to do and for this we use this function menu. What does it? Well, this function asks a question to the user. For example, make your choice. And is the first string that you have to give and then we have to give several choices. So that the user cannot just do whatever he want but just choose among few of the possibilities. First, explain then change the axes then, well I need to go to the next line so I use this triple dots. It's like if the line continued after the comma. Then draw an ellipse. This is the third choice. Then draw the ellipses in a file. Oops! I forgot the quotes. Here they are. Then I go to the next line again and change the accuracy and clean the figure. And the final one is exit from the program. We can already try to run the program as it is. So we save and then run the script. So that we at least see what this menu does. OK. So 'callPlot'. This runs the script and here are the different choices that we have. And we can pick a number among them. I choose, for example, number 2. And then if I look at the choice variable, it's 2. OK. So here we are.

Notes

Summary



# Main program

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>> edit callPlot.m  
>> callPlot  
Fait ton choix  
  
[ 1] explique  
[ 2] change les axes  
[ 3] dessine un ellipse  
[ 4] dessine les ellipse dans l  
e fichier  
[ 5] change la precision  
[ 6] nettoie la figuer  
[ 7] sort du programme  
  
pick a number, any number: 2  
>> choice  
choice = 2  
>> |
```

Command Window

GUI

```
9 % 5- demander la precision du dessin, par d'faut 200 points;  
10 % 6- nettoyer la figure  
11 % 7- sortir  
12  
13 % consignes:  
14 % - organiser le programme  
15 % - sauvegarder le programme principal dans un script  
16 % - utiliser des fonctions dans une fichier .m  
17 % - documenter les fonctions et le programme principal  
18  
19 clear all;  
20 close all;  
21  
22 choice = 1;  
23 while choice ~= 7  
24  
25     switch choice  
26     case 1  
27         explainProgram;  
28     case 2  
29         myAxes = askAxes;  
30         modifyAxes (myAxis);  
31     case 3  
32         ellipse =  
33         I  
34  
35     choice = menu('Fait ton choix','explique', 'change les axes', ...  
36     'dessine un ellipse', 'dessine les ellipse dans le fichier', ...
```

MATLAB and Octave for beginners

But well, we should continue to ask for a choice until the program exit, not just exit after one choice. So I would like to add a while loop. So while choice is different from 7. I will continue asking for a choice. We will make a loop, a while loop, until the choice of user is different from 7. OK. So we finish the loop if we choose 7. What should we do in this loop? We must make a switch to select the choice of the user. So we need to switch with respect to the variable choice. And then treat all the cases. In the first case, here we need to explain the program and we out placeholder explain program is the function that we need to write. A second case is 2 and then here we will need to pick the axes and change them. And again we will write the function that does that. So I can call this function 'modifyAxes'. And for this I will have an output which is myAxis and then I will have to modify the axis. First askAxes and then modify the axis with the new axis. So this is the case number 2. The third case is when you want to request an ellipse to the user and draw it. So you have to save the data. For data center coordinates maximum and minimum principal axis. So the ellipse, it might be requested.

Notes

Summary



# Main program

>> edit cheeseEllipse.txt

Command Window

GUI

```
9 % 5- demander la precision du dessin, par d?faut 200 points;
10 % 6- nettoyer la figure
11 % 7- sortir
12
13 % consignes:
14 % - organiser le programme
15 % - sauvegarder le programme principal dans un script
16 % - utiliser des fonctions dans une fichier .m
17 % - documenter les fonctions et le programme principal
18
19 clear all;
20 close all;
21
22 choice = 1;
23 while choice ~= 7
24
25     switch choice
26     case 1
27         explainProgram;
28     case 2
29         myAxes = askAxes;
30         modifyAxes (myAxis);
31     case 3
32         ellipse = askEllipse;
33         plotEllipse(ellipse);
34     case 4
35
36
```

MATLAB and Octave for beginners

And we will use a new function called 'askEllipse'. OK and this ellipse variable has to contain all the data necessary to plot the ellipse so that then we can just tell 'plotEllipse', a new function and give it the ellipse variable. The first case is when we want to upload the file and this file there are many ellipses. So how is this file? You can download it from the course website. I called it cheese ellipses. Here is the file.

Notes

Summary



5m 56s



# Main program

```
>> edit cheeseEllipse.txt
>> 
```

Command Window

```
1 % Definition des ellipses
2 % ellipse: (x-c1).^2/a1^2 + (y-c2).^2/a2^2 = 1
3 % chaque ligne représente une ellipse
4 % [c1 c2 a1 a2]
5 90, 300, 82, 70
6 92, 65, 12, 12
7 80, 150, 12, 12
8 290, 38, 12, 12
9 458, 127, 12, 12
10 246, 251, 20, 16
11 175, 180, 47, 37
12 337, 169, 75, 50
13 430, 257, 41, 32
14 394, 353, 25, 30
15 524, 280, 14, 22
16 244, 355, 24, 17
17 290, 355, 24, 17
18
```

MATLAB and Octave for beginners

I can edit it and have a look and there are you see several lines with an ellipse. And there is also description of the ellipse, so that you have to use  $c_1$ ,  $c_2$ ,  $a_1$  and  $a_2$  as the center, the main axis of the ellipse. So each line is a new ellipse. OK and there is a mathematical formula tells us how the ellipse is defined. OK. Just the perimeter and not the area. We will use a parametric mathematical formula. We will see that later. For each line we have the numbers 90, 300, 82, 7 and then again other numbers. On the line there is the coordinate of the center. The first and the second then the axis along coordinate 1 and then another axis along the coordinate 2. All these data we should be able to look through. Note that there are the percentage sign at the beginning of the lines here. Those will not be loaded by the load function. The load function will ignore them and just take the other lines. OK.

Notes

Summary



6m 40s

# Main program

```
>> edit cheeseEllipse.txt  
>> |
```

Command Window

GUI

```
19 clear all;  
20 close all;  
21  
22 choice = 1;  
23 while choice ~= 7  
24  
25     switch choice  
26     case 1  
27         explainProgram;  
28     case 2  
29         myAxes = askAxes;  
30         modifyAxes (myAxis);  
31     case 3  
32         ellipse = askEllipse;  
33         plotEllipse(ellipse, Npoints);  
34     case 4  
35         loadFileAndPlot(Npoints);  
36     case 5  
37         Npoints = askPrecision;  
38     case 6  
39         clf  
40     end  
41  
42     choice = menu('Fait ton choix','explique', 'change les axes', ...  
43                 'dessine un ellipse', 'dessine les ellipse dans le fichier', ...  
44                 'change la precision', 'nettoie la figure', 'sort du programme');  
45  
46 end
```

MATLAB and Octave for beginners

So our choice number 4 should provide a load of this file and also draw all the ellipses. So now here we just write the name of the functions that need to be called. So load file and plot. So we will do everything in one single function. Then there is case number 5 which is to define the precision of our figure. So we need a variable Npoints which stores the number of points to be used for our figure. This figure should also be transmitted to the plot. So first let's I'll ask it to the user. But we need it also for the drawing. So in the end we have to modify our functions to accept number of points. So here. And we also need to do it in a 'loadFileAndPlot', which also needs to know what is the precision in drawing. Then case number 6 is clear the figure so 'clf' and not just closing it. We want just to clear not to close it. Then case number 7. Well, here we don't need to do anything because it will just go out of the 'while' so we can close the 'switch' and close the 'while' with end and end again. So before ending the 'while' we need to put a choice otherwise we will not loop again in case this the choice is different from 7. So before you write this function you must analyze them a bit. You should know what are the inputs and outputs before writing them and analyze the latter. Good luck.

Notes

Summary



8m 05s