There are 3 programs in the unzipped file:

1. KGaussian.m: This program computes the Gaussian kernel matrix.
   Usage: K=KGaussian(gamma,A,tildaA)
   where K is the resulting Gaussian Kernel of A to tildaA with the parameter gamma (gamma>0).
2. zerossvr_mtrx.m: This program solves the regularized least squares support vector regression (RLS-SVR) problem. It returns the estimated regression coefficients *w* and *b* (intercept).
   Usage: [w,b]=zerossvr_mtrx(A,y,w0,b0,C)
   where A is the design matrix, y is the response variable,w0, b0 represent the initial values of regression coefficients and the intercept, and C is the parameter controlling the trade-off between goodness-of-fit and degree of regularization (C>0).
   Note: RLS-SVR is a special case of ε -SSVR (Lee et al, 2005). This paper and programs can be downloaded at http://dmlab1.csie.ntust.edu.tw/
3. var_select.m: This is the main program for gene selection. Users can input the original gene expression data A directly, and this program will first perform standardization. Given the expression data A, the corresponding class labels y, the parameters gamma used in Gaussian kernel and C for RLS-SVR, this program will return the absolute weighted expression sums, B, and the corresponding indices , IND.
   Usage: [B IND]=var_select(gamma, C, A, y, command)
   There are 3 options in command:
   -t: 1 or 2 (default), the number of times to reduce the size of the candidate subset. If the user inputs the command '-t 1', the set of genes will be reduced into a subset with size q directly; if the command is '-t 2', the final subset will be found through another intermediate subset of size r.
   -q: Number of the selected genes in the final subset. The default setting is 10. That is, 10 significant genes will be chosen.
   -r: Size of the intermediate candidate subset. The default value is 10q. This intermediate subset is useful only if t=2.

   Examples:
   1. [B IND]=var_select(0.0002,300,A,y,'-t 2 -q 10 -r 100') (the settings are default, so the result is the same as [B IND]=var_select(0.0002,300,A,y)).

Result:

B：

	1	2	3	4	5	6	7	8	9	10
1	150.6797	125.3594	117.9711	92.7434	72.3649	69.6762	64.7264	61.0759	55.6241	5.6697

IND：

	1	2	3	4	5	6	7	8	9	10
1	6201	1882	2402	5552	1779	6181	1763	2345	5308	5648

2. [B IND]=var_select(0.0002,300,A,y,'-t 1 -q 15')

Result:

```
>> [B IND]=var_select(0.0002,300,A,y,'-t 1 -q 15')

B =

  Columns 1 through 8

   92.4471   80.4399   77.8085   70.2470   63.4041   61.5455   59.2609   53.0043

  Columns 9 through 15

   51.8948   49.3119   45.3332   40.2099   32.3604   22.2565    6.5216


IND =

  Columns 1 through 7

       2402        6201        1882        1674        2186        5552        1779

  Columns 8 through 14

       4936        6209        1394        2345        6613          19        5711

  Column 15

       5710
```

3. [B IND]=var_select(0.0002,300,A,y,'-q 10')

```
>> [B IND]=var_select(0.0002,300,A,y,'-q 10')

B =

  Columns 1 through 9

  150.6797  125.3594  117.9711   92.7434   72.3649   69.6762   64.7264   61.0759   55.6241

  Column 10

    5.6697


IND =

  Columns 1 through 7

       6201        1882        2402        5552        1779        6181        1763

  Columns 8 through 10

       2345        5308        5648
```