

var, v. 0.1: Compute Mean and Variance of a List of Numbers

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1 Introduction

2 Getting Started

var was written in C on a computer running Linux and should work on any standard UNIX system. However, please contact me at haubold@evolbio.mpg.de if you have any problems with the program.

- Unpack the program

```
tar -xvzf var_XXX.tgz
```

where XXX indicates the version.

- Change into the newly created directory

```
cd Var_XXX
```

and list its contents

```
ls
```

- Generate var

```
make
```

- List its options

```
./var -h
```

3 Listing

The following listing documents the driver program for var.

```
1  /***** var.c *****/
   * Description:
   * Author: Bernhard Haubold, haubold@evolbio.mpg.de
   * Date: Fri Nov 11 12:00:32 2016
   *****/
6  #include <stdio.h>
   #include <stdlib.h>
   #include "interface.h"
   #include "eprintf.h"
```

```

11 void scanFile(FILE *fp, Args *args){
    long n = 0;
    long i;
    long maxN = 1;
    double x, mean, sx, sxx, var, diff;
16 double *arr = emalloc(maxN * sizeof(double));

    while(fscanf(fp,"%lf",&x) != EOF){
        arr[n++] = x;
        if(n == maxN){
21 maxN *= 2;
            arr = erealloc(arr, maxN * sizeof(double));
        }
    }
    arr = erealloc(arr, n * sizeof(double));
26 mean = 0;
    for(i=0;i<n;i++){
        mean += arr[i];
    }
    mean /= n;
    sx = sxx = 0.;
31 for(i=0;i<n;i++){
    diff = arr[i] - mean;
    sx += diff;
    sxx += diff * diff;
}
36 var = (sxx-sx*sx/n)/(n-1);
    printf("#mean\tvar\n");
    printf("%e\t%e\n",mean,var);
    free(arr);
}

41 int main(int argc, char *argv[]){
    int i;
    char *version;
    Args *args;
46 FILE *fp;

    version = "0.1";
    setprogname2("var");
    args = getArgs(argc, argv);
51 if(args->v)
    printSplash(version);
    if(args->h || args->e)
    printUsage(version);
    if(args->numInputFiles == 0){
56 fp = stdin;
        scanFile(fp, args);
    }else{
        for(i=0;i<args->numInputFiles;i++){
            fp = fopen(args->inputFiles[i],"r");
61 scanFile(fp, args);
            fclose(fp);
        }
    }
}

```

```
    free (args) ;  
66    free (progname ( ) ) ;  
    return 0 ;  
}
```

4 Change Log

- Version 0.1 (Nov. 11, 2016)
 - First running version.