**BIL105E**

Introduction to Scientific and Engineering Computing

2010 Spring

**Report of HW3**

Date of Submission : 22.04 2010

Student Name :

Student Number :

Instructor :

CRN:

**1-Introduction**

The purpose of this homework is to develop a C program to calculate and display the

the mean average, standard deviation and the students' grades' letters.

The program should read the student number,firstname,lastname,hw1result,hw2result,midtermresult,

and finalresult from keyboard.

**2-Development and Operating Environments**

MS Windows

The Dev-C++ environment has been used to write the source code, compile and run

the program.

Unix

The source code has been also copied to Unix, then compiled and tested with the

GNU C Compiler. The following is the commands used:

To compile : gcc -o hw3.exe hw3.c -lm

To run : ./hw3.exe

3-Data Structures and Variables

structure student[100];

{

char number[10]; //students' number

char firstname[15]; //students' firstname

char lastname[15]; //students' lastname

float midterm; //students' midterm results

float final; //students' final result

float hw1; //students' homework1 results

float hw2; //students' homework2 results

double x; //students'

double grade; //students' real grades

}

int i=0; //loop counter

int j; //loop counter

int k; //that is used for holding student[].number with integer

int n; //that show's us how many student's will join calculatings

int c; //that is used for converting student[].grade integer from double

float finalavg=0.0; //average value of final results

float midavg=0.0; //average value of midterm results

float hw2avg; //average value of homework2 results

float hw1avg; //average value of homework1 results

double tut=0; //holding student[].grade for buble sort

char tut2[10]; //holding student[].number for buble sort

char tut3[15]; //holding student[].firstname for buble sort

char tut4[15]; //holding student[].lastname for buble sort

float tot=0.0; //holding sum of students' grades

float m; //that shows average(mean) grade

float total=0.0; //that is used for holding pow(student[].grade-m,2 )

int aacount=0; //that counts 'AA' letters

int bacount=0; //that counts 'BA' letters

int bbcount=0; //that counts 'BB' letters

int cbcount=0; //that counts 'CB' letters

int cccount=0; //that counts 'CC' letters

int dccount=0; //that counts 'DC' letters

int ddcount=0; //that counts 'DD' letters

int ffcount=0; //that counts 'FF' letters

int vfcount=0; //that counts 'VF' letters

4-Program Flow

**Pseudocode**

Begin

i=0;

midavg=0;

finalavg=0;

hw1avg=0;

hw2avg=0;

tot=0.0;

total=0.0;

while(student[].number!=-1)

Begin

Input student[].number,student[].firstname,student[].lastname,

student[].midterm,student[]final,student[].hw1,student[].hw2

i++

End

n=i-1

for(i=0;i<=n;i++)

Begin

midavg+=student[i].midterm

finalavg+=student[i].final

hw1avg+=student[i].hw1

hw2avg+=student[i].hw2

student[i].grade=0.25\*student[i].midterm + 0.4\*student[i].final + 0.15\*student[i].hw1 +

0.25\*student[i].hw2

tot+=student[i].grade

End

m=tot/n

for i=0 i to n step 1

Begin

student[i].grade=0.25\*student[i].midterm + 0.4\*student[i].final + 0.15\*student[i].hw1 +

0.25\*student[i].hw2

total+=pow(student[i].grade-m,2)

End

devia=sqrt(total/n);

for j=1 j to n step 1

Begin

for i=0 i to n step 1

Begin

if(student[i].grade<student[i+1].grade)

Begin

tut=student[i].grade; student[i].grade=student[i+1].grade; student[i+1].grade=tut;

tut2=student[i].number student[i].number=student[i+1].number student[i+1].number=tut2

tut3=student[i].firstname student[i].firstname=student[i+1].firstname student[i+1].firstname=tut3

tut4=student[i].lastname student[i].lastname=student[i+1].lastname student[i+1].lastname=tut4

End

End

End

for i=0 to n step 1

Begin

c=student[i].grade

Input student[i].number,student[i].firstname,student[i].lastname,c

if(c==0)

Begin

display VF && ++vfcount

End

else if(c>=m+1.5\*devia)

Begin

display AA && ++aacount

End

else if(c>=m+1.0\*devia)

Begin

display BA && ++bacount

End

else if(c>=m+0.5\*devia)

Begin

display BB && ++bbcount

End

else if(c>=m)

Begin

display CB && ++cbcount

End

else if(c>=m-0.5\*devia)

display CC && ++cccount

End

else if(c>=m-1.0\*devia)

display DC && ++dccount

End

else if(c>=m-1.5\*devia)

display DD && ++ddcount

End

else

Begin

display FF && ++ffcount

End

display finalavg/n,midavg/n,hw1avg/n,hw2avg/n,m and devia

display aacount

for i=0 i to aacount step 1

Begin

display \*

End

display bacount

for i=0 i to bacount step 1

Begin

display \*

End

display bbcount

for i=0 i to bbcount step 1

Begin

display \*

End

display cbcount

for i=0 i to cbcount step 1

Begin

display \*

End

display cccount

for i=0 i to cccount step 1

Begin

display \*

End

display dccount

for i=0 i to dccount step 1

Begin

display \*

End

display ddcount

for i=0 i to ddcount step 1

Begin

display \*

End

display ffcount

for i=0 i to ffcount step 1

Begin

display \*

End

display vfcount

for i=0 i to vfcount step 1

Begin

display \*

End

End

5-Conclusion

In this homework, I have learned the followings:

-I've learned how to write pseducode

-I've learned to use C structures with an array

-I've learned to use standard C library functions like a atoi,strcpy...

-In addition I've learned to write complicated and long C codes with readable order