Ryerson University
Department of Computer Science
CPS125 - Winter 2014
Midterm Test - Section IX (Programming)

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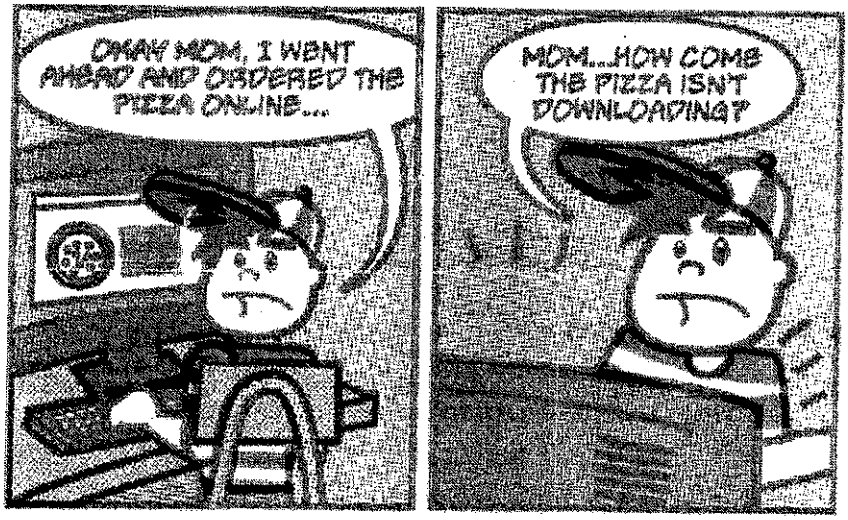
Please circle your professor's name

Davoudpour	Derpanis	Ding	Hamelin	Kokkarinen
Mastoras	Panar	Pavlovych	Tirandazian	Woungang

Note: This section must be written in pen.



FOR OFFICE USE ONLY

1 to 30	31	32	TOTAL
25	5	3	33
/30	/5	/5	/40

Do not open the test until instructed

Question 31 (5 marks):

Write a complete program that calculates the final grade in a course.

Ask the user to enter 4 marks: The midterm test, the final exam, the projects, and the labs. All marks are out of 100.

Calculate the average of the two tests.

Calculate the average of the labs and projects.

The final grade is to be calculated like this. If the test/exam average is below 50% or the labs/projects average is below 50%, give an F grade.

If both averages are above 50%, take the lower of the two averages and apply the following grade conversion scale: A = 80 - 100, B = 70 - 79.9, C = 60 - 69.9, D = 50 - 59.9, F = 0 - 49.

Print out the final letter grade.

```
# include <stdio.h>    # include <math.h>
int
main (void)
{  /* Part 1 */
   double midterm, final, project, labs, avg_tests, avg_othe, GRADE;
   printf ("Please input the midterm, final, project & labs marks out of 100 respectively");
   scanf ("%lf %lf %lf %lf", &midterm, &final, &project, &labs);
   avg_tests = (midterm + final/2.0); /* Part 2 */
   printf ("The test average is %.1lf \n", avg_tests);
   /* Part 3*/
   avg_othe = (labs + project)/2.0;
   printf ("The average of labs & projects is %.1lf \n", avg_othe);
   /* Part 4*/
   if(avg_tests < 50 || avg_test > 50)
       printf("Failure \n");
   /* Part 5*/
   else
   if(avg_test < avg_othe)
       GRADE = avg_test;
   else
       GRADE = avg_othe;

   /* Rest is a bak */
```

You may continue on the next page if you need more space...

```
if (GRADE <=100  && GRADE >= 80)
  printf("A \n");
else
if (GRADE < 80  && GRADE >=70)
  printf("B \n");
else
 if (GRADE < 70  && GRADE >= 60)
  printf ("C \n");
 else
 if (GRADE <60  && GRADE >=50)
  printf("D \n");
 else
  printf ("Failure \n");
  return(0);
}
```

Question 32 (5 marks): 3

A civil engineer wants to build a bridge across a river. The file containing soil sample data is named **soil.txt**. It contains real numbers (doubles). We do not know in advance the number of samples in the file.

Write a C program that calculates the average value of the samples and prints out the average and a recommendation to build.

Your program must make use of a user-defined function that establishes the building recommendation. That function is named **recomm** and it takes in the samples average and returns 1 if the square root of the average is above 2.5 and 0 if the average is less or equal that value.

Based on the value of the recommendation (1 means build, 0 means don't build), print out a sentence indicating if your suggest to build or not at that location.

```
#include <stdio.h>   #include <math.h>
int
recomm(int build_num)
{
  double avg, sample, x, determinator;
  FILE *in;
  *in = fopen("soil.txt", "r");
  sample = 0; x = 0;
  while (in != EOF)
   {
     sample = sample + sample;
     fscanf("%lf", &sample);
     if (sample > 0)
        ++x;
   }
  avg = sample/x;
  determinator = sqrt(avg);
  if (determinator > 2.5)
     build_num = 1;
  else
  if(determinator <= 2.5)
     build_num = 0;
  return (build_num);
}
```

-1 in main -0.5

-0.5

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/* REST IN NEXT PAGE */

```
int
main (void)
{
    int x;
    x = recomm (build_num);
    if (x == 1)
        printf ("BUILD\n");
    else
    if (x == 0)
        printf ("DO NOT BUILD\n");
    return (0);
}
```

End of test.