

2 1 0 0 1 0 0 0
128 64 32 16 8 4 2 1
Ryerson University

Department of Computer Science

CPS125 - Winter 2013

Midterm Test - Section IX (Programming)

Family Name: _____ Given Name: _____

Student #: _____ Section number: 23

Your Ryerson email: _____@ryerson.ca

Please circle your professor's name

Betel

Davoudpour

Derpanis

Ding

Kokkarinen

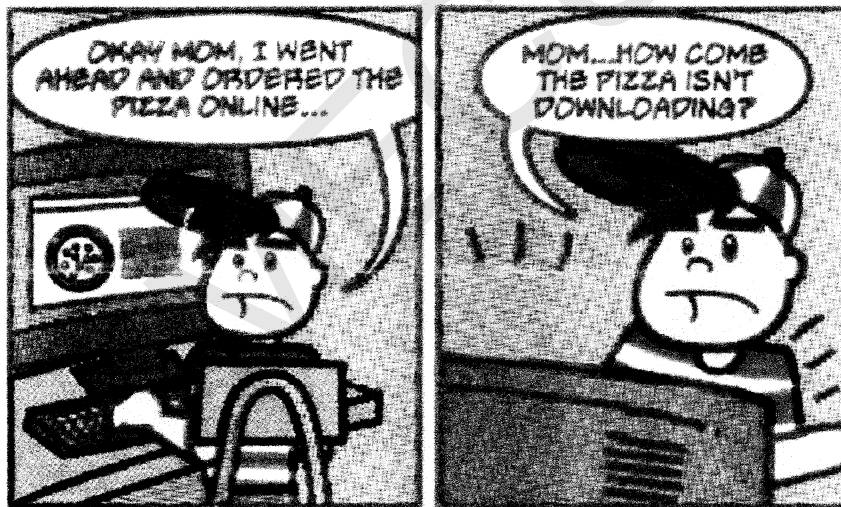
Moore

Panar

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Tirandazian

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Note: This section must be written in pen.

FOR OFFICE USE ONLY

1 to 30	31	32	TOTAL
	5	35	
/30	/5	/5	/40

Do not open the test until instructed

Question 31 (5 marks):

The alternate Fibonacci sequence is a series of whole numbers starting with 0 and 1. After these two, each subsequent number is the sum of the two numbers which precede it. ($0+1 \Rightarrow 1$, $1+1 \Rightarrow 2$, $1+2 \Rightarrow 3$, $2+3 \Rightarrow 5$...). For example the first 7 numbers are 0, 1, 1, 2, 3, 5, 8...

Write a complete C program that **calculates** and prints out the first 20 odd numbers of the alternate Fibonacci sequence (1, 1, 3, 5...).

Your program must contain a function (you write the function and name it **odd**) that returns 1 if the argument is an odd number and 0 if it is an even number.

```
#include <stdio.h>
```

```
#include <math.h> /* Just in case */
```

```
/* writing function definition for "odd" */
```

```
int
odd (int n)      ✓
{
    int od = 0;
    if (n % 2 != 0) ✓
        od = 1;
    else
        od = 0;
    return (od);
}
```

/* Starting main function where ~~the~~ odd will be called to check if number is odd. */

```
int
main (void)
```

```
{
    int number, sum, oddcount; /* declaring variables */
```

```
    while /* initializing variables */
```

```
    number = ;
    sum = ;
    oddcount = ;
```

```
    while (oddcount < )
```

```
    {
        sum = sum + number;
```

```
        number = number + 1;
```

```
        if (odd(sum))
```

```
        {
```

```
            oddcount += 1;
```

```
            printf (" \n %d", sum);
```

```
        }
```

```
    }
```

```
}
```

```
return (0);
```

```
}
```

~~*/~~ /* see back of previous page for the "main" function */

For this part see Question page.

↑↑↑

Cont... from Question 31

Starting main function *1

```
int main(void)
```

```
{
  int a, b, c, oddcount
  oddcount = 0;
```

```
  a = 0;
```

```
  b = 1;
```

```
  c = 0;
```

```
  while (oddcount <= 20) {
```

```
    c = a + b;
```

```
    b = a;
```

```
    a = c;
```

```
    if (odd(c)) {
```

```
      {
```

```
        oddcount += 1;
```

```
        printf ("In %d", c);
```

```
      }
```

```
    }
```

```
  return (0);
```

```
}
```

Question 32 (5 marks):

A civil engineer wants to build a bridge across a river. The file containing soil sample data is named samples.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 (**yes** if the average is more than 2.5, **no** if the average is less or equal that value).

```
#include <stdio.h>
#include <math.h> /* Just in case */

int
main (void)
{
    double sum, count, average sum=0.0; /* declare and initializing variables */
    double count=0.0;
    double average = 0.0; double d; int status;
    FILE * in;
    in = fopen ("samples.txt", "r");

    for (d=0.0; d<100.0; status!=0; )
    while (status != EOF)
    {
        status = fscanf (in, "%lf", &d);
        sum = sum + d;
        count = count + 1.0;
    }
    average = sum / count;
    printf ("%lf", average);
    if (average <= 2.5)
        printf ("NO, it is not recommended to Build a Bridge");
    Else
        printf ("YES, you can build one");
    return (0);
}
```

no value here!

End of test.