**Отчет по лабораторной работе № 9** по курсу "Фундаментальная Информатика"

Студент группы М8О-105Б-20 Манташев Асадулла Уллубиевич, № по списку 17

Контакты e-mail: [asad.mantashev@gmail.com](mailto:asad.mantashev@gmail.com)

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Преподаватель: каф. 806 Никулин Сергей Петрович

Входной контроль знаний с оценкой \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Отчет сдан « » октября\_\_\_ 2020 г., итоговая оценка \_\_\_\_\_

Подпись преподавателя \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Тема:** Рекуррентные соотношения\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. **Цель работы:** Составление и отладка простейшей программы на языке С итеративного характера с \_\_\_\_\_\_\_\_\_ целочисленными реккурантными соотношениями, задающими некоторое регулярное движение точки в\_\_\_\_\_\_\_ целочисленной системе координат (i,j) с дискретным временм k и динамическим параметром движения\_\_\_\_\_\_\_ l\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. **Задание** (*вариант № 14* )**:** Лунка, являющаяся пересечением двух кругов радиуса 10, центр первого круга - в точке (-10, -10), центр второго - в точке ( -20, -20) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

i0 = 6, j0 = 27, l0 = -15\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

i(k+1) = (i(k)^3-j(k)^3+l(k)^3-k) mod 20\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

j(k+1) = min(i(k)\*j(k)\*j(k)-k, i(k)\*i(k)\*l(k)-k, j(k)\*l(k)\*l(k)-k) mod 30

l(k+1) = max(i(k)\*j(k)\*j(k)-k, i(k)\*i(k)\*l(k)-k, j(k)\*l(k)\*l(k)-k) mod 30

1. **Оборудование** :

Процессор Intel Core i5-6200U с ОП 8 Гб, НМД 500 Гб. Монитор встроенный\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
Другие устройства не использовались\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. **Программное обеспечение:**

*Программное обеспечение ЭВМ студента, если использовалось:*

Операционная система семейства GNU\Linux, наименование Ubuntu версия 18.04 интерпретатор команд bash версия 4.4.19(1)-release  
Система программирования GNU(gcc)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ версия 8.1\_\_\_\_\_\_\_\_\_\_\_\_\_   
Редактор текстов microsoft word 2019\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Утилиты \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

GNU(gcc)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ версия 8.1\_\_\_\_\_\_\_\_\_\_\_\_\_   
Редактор текстов microsoft word 2019\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Утилиты \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Местонахождение и имена файлов программ и данных /home/asadec\_

1. **Идея, метод, алгоритм**  решения задачи (в формах: словесной, псевдокода, графической [блок-схема, диаграмма, рисунок, таблица] или формальные спецификации с пред- и постусловиями)  
     
   Создаём несколько функций, которые могут понадобится для написания заданных рекуррентных соотношений в на

языке Си. В данном случае это функции выбора максимального и минимального числа из двух, функция

mod . Далее создаём цикл, который будет идти, пока точка не попадёт в заданную область, или

пока цикл не сделает 50 шагов. На каждом шаге i , j , l будут меняться в соответствии с заданными формулами.

1. **Сценарий выполнения работы** [план работы, первоначальный текст программы в черновике (можно на отдельном листе) и тесты либо соображения по тестированию].

k = 0, i = 6, j = 27

k = 1, i = 18, j = 0

k = 2, i = 6, j = 29

k = 3, i = 14, j = 22

k = 4, i = 16, j = 9

k = 5, i = 18, j = 2

k = 6, i = 15, j = 7

k = 7, i = 5, j = 9

k = 8, i = 18, j = 8

k = 9, i = 0, j = 24

k = 10, i = 11, j = 21

k = 11, i = 15, j = 5

k = 12, i = 10, j = 4

k = 13, i = 8, j = 22

k = 14, i = 3, j = 9

k = 15, i = 19, j = 1

k = 16, i = 4, j = 16

k = 17, i = 8, j = 0

k = 18, i = 15, j = 13

k = 19, i = 17, j = 19

k = 20, i = 18, j = 28

k = 21, i = 8, j = 2

k = 22, i = 11, j = 11

k = 23, i = 1, j = 7

k = 24, i = 14, j = 26

k = 25, i = 8, j = 20

k = 26, i = 7, j = 25

k = 27, i = 17, j = 29

k = 28, i = 6, j = 14

k = 29, i = 12, j = 28

k = 30, i = 19, j = 13

k = 31, i = 11, j = 1

k = 32, i = 18, j = 10

k = 33, i = 12, j = 28

k = 34, i = 3, j = 27

k = 35, i = 5, j = 11

k = 36, i = 10, j = 0

k = 37, i = 0, j = 24

k = 38, i = 3, j = 23

k = 39, i = 15, j = 25

k = 40, i = 0, j = 6

k = 41, i = 0, j = 20

k = 42, i = 15, j = 19

k = 43, i = 3, j = 27

k = 44, i = 8, j = 14

k = 45, i = 8, j = 12

k = 46, i = 19, j = 15

k = 47, i = 1, j = 29

k = 48, i = 14, j = 12

k = 49, i = 16, j = 0

Промах

*Пункты 1-7 отчета составляются сторого до начала лабораторной работы.*

*Допущен к выполнению работы.*  **Подпись преподавателя \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. **Распечатка протокола**  (подклеить листинг окончательного варианта программы с тестовыми примерами, подписанный преподавателем).  
     
     
   asadec@asadec:~/Desktop$ cat 9lab.c

#include <stdio.h>

int mod (int a, int b) {

return (b + a % b) % b;

}

int min (int a, int b, int c){

if (a < b){

if (c > a){

return a;

}

else{

return c;

}

}

else{

if (b < c){

return b;

}

else{

return c;

}

}

}

int max (int a, int b, int c){

if (a < b){

if (c < b){

return b;

}

else{

return c;

}

}

else{

if (a > c){

return a;

}

else{

return c;

}

}

}

int circle1 (int a, int b){

return (a + 10) \* (a + 10) + (b + 10) \* (b + 10);

}

int circle2 (int a, int b){

return (a + 20) \* (a + 20) + (b + 20) \* (b + 20);

}

int main (){

int i0,j0,l0,i,j,l,f;

i0 = 6;

j0 = 27;

l0 = -15;

i = 6;

j = 27;

l = -15;

f=0;

for (int k = 0 ; k < 50; k++){

printf ("k = %d, i = %d, j = %d\n", k, i, j);

if (circle1 (i, j) <= 100 && circle2 (i, j) <= 100){

printf ("Попадание k = %d, i = %d, j = %d\n", k, i, j);

f = 1;

break;

}

i = mod((i0\*i0\*i0 - j0\*j0\*j0 + l0\*l0\*l0 - k), 20);

j = mod(min(i0\*j0\*j0 - k, i0\*i0\*l0 - k, j0\*l0\*l0 - k), 30);

l = mod(max(i0\*j0\*j0 - k, i0\*i0\*l0 - k, j0\*l0\*l0 - k), 30);

i0 = i;

j0 = j;

l0 = l;

}

if (f == 0){

printf ("Промах\n");

}

}

asadec@asadec:~/Desktop$ gcc 9lab.c && ./a.out

k = 0, i = 6, j = 27

k = 1, i = 18, j = 0

k = 2, i = 6, j = 29

k = 3, i = 14, j = 22

k = 4, i = 16, j = 9

k = 5, i = 18, j = 2

k = 6, i = 15, j = 7

k = 7, i = 5, j = 9

k = 8, i = 18, j = 8

k = 9, i = 0, j = 24

k = 10, i = 11, j = 21

k = 11, i = 15, j = 5

k = 12, i = 10, j = 4

k = 13, i = 8, j = 22

k = 14, i = 3, j = 9

k = 15, i = 19, j = 1

k = 16, i = 4, j = 16

k = 17, i = 8, j = 0

k = 18, i = 15, j = 13

k = 19, i = 17, j = 19

k = 20, i = 18, j = 28

k = 21, i = 8, j = 2

k = 22, i = 11, j = 11

k = 23, i = 1, j = 7

k = 24, i = 14, j = 26

k = 25, i = 8, j = 20

k = 26, i = 7, j = 25

k = 27, i = 17, j = 29

k = 28, i = 6, j = 14

k = 29, i = 12, j = 28

k = 30, i = 19, j = 13

k = 31, i = 11, j = 1

k = 32, i = 18, j = 10

k = 33, i = 12, j = 28

k = 34, i = 3, j = 27

k = 35, i = 5, j = 11

k = 36, i = 10, j = 0

k = 37, i = 0, j = 24

k = 38, i = 3, j = 23

k = 39, i = 15, j = 25

k = 40, i = 0, j = 6

k = 41, i = 0, j = 20

k = 42, i = 15, j = 19

k = 43, i = 3, j = 27

k = 44, i = 8, j = 14

k = 45, i = 8, j = 12

k = 46, i = 19, j = 15

k = 47, i = 1, j = 29

k = 48, i = 14, j = 12

k = 49, i = 16, j = 0

Промах

1. **Дневник отладки** должен содержать дату и время сеансов отладки и основные события (ошибки в сценарии и программе, нестандартные ситуации) и краткие комментарии к ним. В дневнике отладки приводятся сведения об использовании других ЭВМ, существенном участии преподавателя и других лиц в написании и отладке программы.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| № | Лаб. или дом. | Дата | Время | Событие | Действие по исправлению | Примечание |
|  |  |  |  |  |  |  |

1. **Замечания автора** по существу работы \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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В ходе лабораторной работы ознакомилcя с рекуррентными соотношениями, научился создавать функции на языке Си.\_\_

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Недочёты при выполнении задания могут быть устранены следующим образом: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Подпись студента \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_