CPT 111 – PRINCIPLES OF PROGRAMMING

Pusat Pengajian Sains Komputer

Universiti Sains Malaysia

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Course : CPT111

Assignment : 1

Report for: Hackathon 1 Part A

Group : 47

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Table Of Contents

1.0 Problem analysis

Develop a C++ program for finding the most appropriate dining table for family dining hall/room. The customer will provide the dimension of their dining hall/room. And the program will find a suitable table that can optimise the space given by the consumer without over-crowding it. In creating a comfortable space, there should be about 1m space for the people's movement and chair usage and at least another 0.6m, providing some space so there are some places to roam. The program will at least propose one or if possible two solutions from a selection of tables given based on different room measurements. The program may be designed to provide sufficient information to customers on the advantage of the best tables the program has chosen. The program must however use metric size (m, cm or mm). It assumed that the dimension of the dining hall/room is in length and width and not in any specific order given as output. The program must have interactive features and meaningful comments in the source codes.

2.0 Specification requirement

2.1 Input

1. Length
2. Width

2.2 Process

1. Area = length x width

2.3 Output

1. Suitable table for the space provided by the consumer

2.4 Constraints

1. Must not use loop, array, function, pointers, or any other topics which only will be covered after week 4.
2. Must not use global variable.
3. Must not use vector, list, queue, or any possible data structure provided by the built-in C++ library
4. Must not use <vector>, <stdio>, <list>, <linkedlist>, <queue>, <stack> and any other preprocessor never used before during your lab session. On the other hand, all the directives in the programme's pre-processor which have been exposed to during your class and the lab sessions may be used.

3.0 Design and solution

3.1 Pseudocode

Start

1.0 Initialize const float area_rectangle_heinrich = 18.0,

const float area_rectangle_niklas = 19.27,

const float area_rectangle_bertha = 22.26,

const float area_rectangle_shade = 26.04,

const float area_round_nadine = 69.4,

const float area_round_emma = 65.04,

const float area_square_lea = 16.81,

const float area_square_finn = 15.68,

const float area_oval_stefan = 27.9,

2.0 Get length, width

3.0 Find arearoom, the area of the room using the input given by the user

3.1 arearoom = length*width

3.2 if (arearoom>=65.04)

3.2.1 print "The best table is: 1. Round Nadine 2. Round Emma"

3.3 else if (arearoom>=26.04 && arearoom<65.04)

3.3.1 print "The best table is: 1. Oval Stefan 2. Rectangle Shaded"

3.4 else if (arearoom>=19.27 && arearoom<26.04)

3.4.1 print "The best table is: 1. Rectangle Bertha 2. Rectangle Niklas"

3.5 else if (arearoom>=16.81 && arearoom<19.27)

3.5.1 print "The best table is: 1. Rectangle Heinrich 2. Square Lea"

3.6 else if (arearoom>=15.68 && arearoom<16.81)

3.6.1 print "The best table is: 1. Rectangle Heinrich 2. Square Finn"

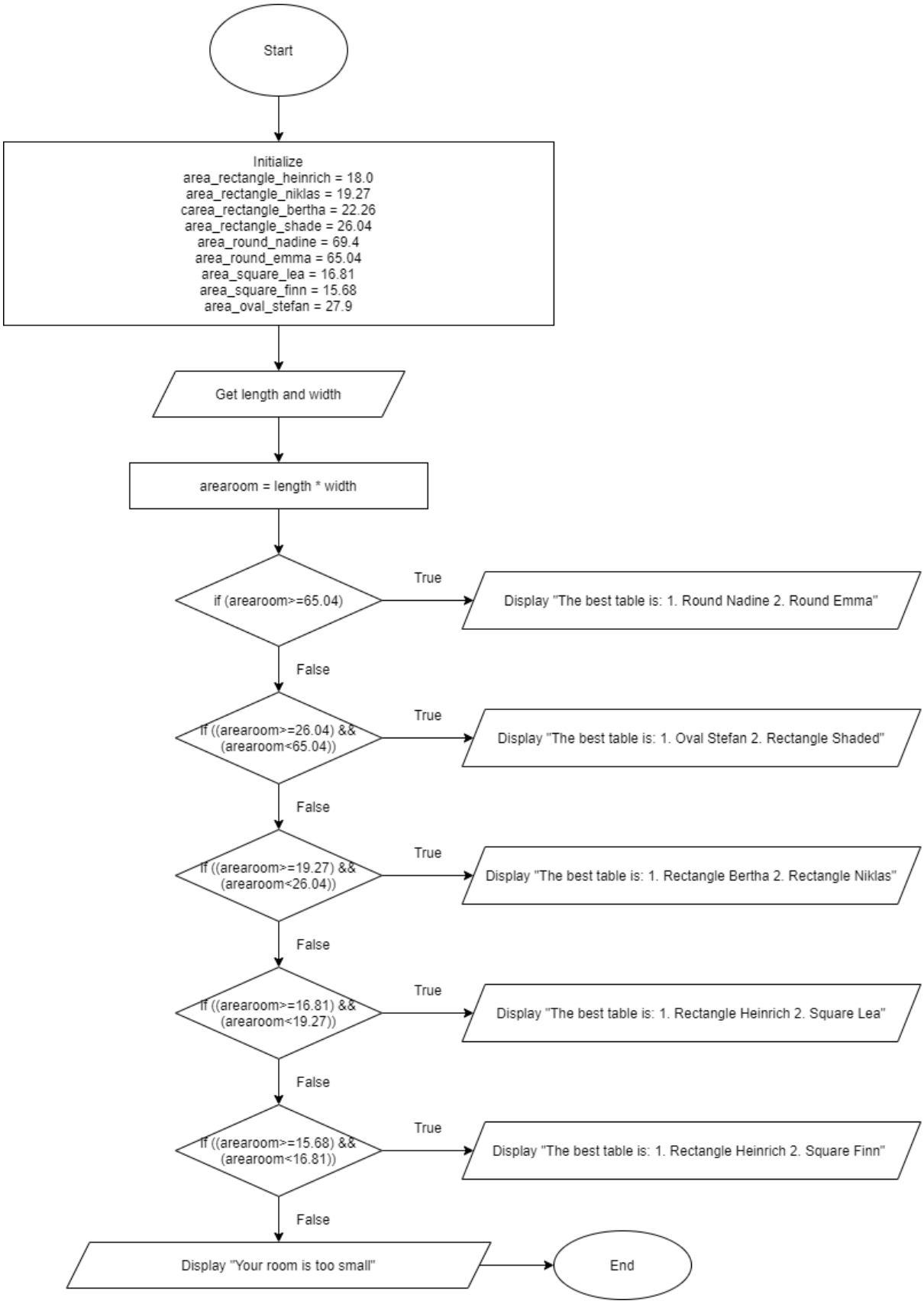
3.7 else

3.7.1 print "Your room is too small"

endif

End

3.2 Flowchart



3.3 Source code

```
/*
*This program has developed to suggest the 2 best option for the customers depending on their room size.
*Program : Dining Table for the Living Room
* developer
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*/
#include<iostream>
using namespace std;
int main()
{
    float length,width ,arearoom;
    const float area_rectangle_heinrich = 18.0;//seventh largest table
    const float area_rectangle_niklas = 19.27; //sixth largest table
    const float area_rectangle_bertha = 22.26; //fifth largest table
    const float area_rectangle_shade = 26.04;  //forth largest table
    const float area_round_nadine = 69.4;      //largest table
    const float area_round_emma = 65.04;       //third largest table
    const float area_square_lea = 16.81;       //eighth largest table
    const float area_square_finn = 15.68;      //smallest table
    const float area_oval_stefan = 27.9;       //third largest table

    cout<<"    --HELLO WELCOME TO GROUP 47 FURNITURE STORE !--"<<endl<<endl;
    cout<<">   Our store provide a new beautiful table furniture for your house   <"<<endl<<endl;
    cout<<"    Here is our list of table furniture :"<<endl<<endl;
    cout<<"  1. Rectangle Heinrich"<<endl;
    cout<<"  2. Rectangle Niklas"<<endl;
    cout<<"  3. Rectangle Bertha"<<endl;
    cout<<"  4. Rectangle Shade"<<endl;
    cout<<"  5. Round Nadine"<<endl;
    cout<<"  6. Round Emma"<<endl;
    cout<<"  7. Square Lea"<<endl;
    cout<<"  8. Square Finn"<<endl;
    cout<<"  9. Oval Stefan"<<endl<<endl;

    cout<<"  Enter your room dimension so that we can suggest the best table size for you"<<endl<<endl;
    cout<<"  Your room length in meter: ";
    cin>>length;                              // length from user for area calculation
    cout<<"  Your room width  in meter: ";
    cin>>width;
    cout<<endl;                              // width from user for area calculation
    arearoom = length * width;               // calculation for the area of customer room

    if (arearoom>=65.04)                            //condition suitable for room larger than 65.04 m
    {
        cout<<"\n  The 2 best table is:"<<endl;
        cout<<"    1. Round Nadine"<<endl;
        cout<<"    2. Round Emma"<<endl;
    }
    else if (arearoom>=26.04 && arearoom<65.04)  //condition suitable for room size between 26.04m until 65.04m
    {
        cout<<"\n  The 2 best table is:"<<endl;
        cout<<"    1. Oval Stefan"<<endl;
        cout<<"    2. Rectangle Shade"<<endl;
    }
    else if (arearoom>=19.27 && arearoom<26.04)  //condition suitable for room size between 19.27 until 26.04m
    {
        cout<<"\n  The 2 best table is:"<<endl;
        cout<<"    1. Rectangle Bertha"<<endl;
        cout<<"    2. Rectangle Niklas"<<endl;
    }
    else if (arearoom>=16.81 && arearoom<19.27)  //condition suitable for room size between 16.81 until 19.27m
    {
        cout<<"\n  The 2 best table is:"<<endl;
        cout<<"    1. Rectangle Heinrich"<<endl;
        cout<<"    2.  Square Lea"<<endl;
    }
    else if (arearoom>=15.68 && arearoom<16.81)  //condition suitable for room size between 15.68 until 16.81m
    {
        cout<<"\n  The 2 best table is:"<<endl;
        cout<<"    1. Rectangle Heinrich"<<endl;
        cout<<"    2. Square Finn"<<endl;
    }
    else
        cout<<"\n  Your room is too small";

    return 0;
}
```

3.4 First test data

```
    --HELLO WELCOME TO GROUP 47 FURNITURE STORE !--

>   Our store provide a new beautiful table furniture for your house   <

    Here is our list of table furniture :

  1. Rectangle Heinrich
  2. Rectangle Niklas
  3. Rectangle Bertha
  4. Rectangle Shade
  5. Round Nadine
  6. Round Emma
  7. Square Lea
  8. Square Finn
  9. Oval Stefan

  Enter your room dimension so that we can suggest the best table size for you

  Your room length in meter: 9
  Your room width  in meter: 7


  The 2 best table is:
    1. Oval Stefan
    2. Rectangle Shade

--------------------------------
Process exited after 11.27 seconds with return value 0
Press any key to continue . . .
```

3.5 Second test data

```
    --HELLO WELCOME TO GROUP 47 FURNITURE STORE !--

>   Our store provide a new beautiful table furniture for your house   <

    Here is our list of table furniture :

  1. Rectangle Heinrich
  2. Rectangle Niklas
  3. Rectangle Bertha
  4. Rectangle Shade
  5. Round Nadine
  6. Round Emma
  7. Square Lea
  8. Square Finn
  9. Oval Stefan

  Enter your room dimension so that we can suggest the best table size for you

  Your room length in meter: 4
  Your room width  in meter: 3


  Your room is too small
--------------------------------
Process exited after 13.62 seconds with return value 0
Press any key to continue . . .
```