

LOCATION: SWANSEA

LLEOLIAD: ABERTAWE

LEVEL 4

LEFEL 4

EXAMINATION PERIOD
MAY 2019

CYFNOD ARHOLIADAU
MAI 2019

MODULE CODE: ACCA4016
ACADEMIC AND EMPLOYABILITY SKILLS

TIME: 2 HOURS

ANSWER ALL QUESTIONS

NOTE: IN-CLASS TEST, TIME/DATE TO BE ARRANGED BY LECTURER

Equipment or materials required – Computers with Visual Studio installed

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ANSWER ALL QUESTIONS

1A

A programmer has created a function named InputCostsProcessAndOutputResult. Give reasons why this function name is a poor choice.

The function name does not adequately describe the action being performed by the function (badly named).

The name indicates that the function is performing multiple actions and that the programmer has failed to adequately evaluate the problem.

4 Marks

1B

Provide a list of the problems that must be solved to implement the code for this application and place them in the order that you would attempt to solve them. Avoid vague statements that may involve solving multiple problems.

Answers will vary but should be similar to the following:

- Ask user to login
- Store correct username and password
- Read user name and password (“hide” password?)
- Count the attempts
- Start a timer 3 bad attempts are made
- Enable and disable login
- Display prompt for user to enter price
- Input number
- Check valid number entered
- Retry number entry
- Input number of products
- Store multiple prices
- Enter multiple product prices
- Calculate tax paid on product
- Calculate total tax paid
- Display total tax paid

8 Marks

1C

Describe tests.

Check login with correct username and password

Check login with incorrect username

Check login with incorrect password

Check login disabled after 3 attempts

Check login re-enabled after 5 minutes

Check error indicated when invalid number entered i.e. “text”

Check number is re-entered until valid value provided

8 Marks

2. Student should identify a number of problems and the provided application should implement functions for a number of the following:

- Displaying a menu
- Main function ... containing a while loop checking for exit
- Inputting a valid number for the chosen option and asking user to re-enter it if it is not valid.
- Processing the option using a switch statement
- Calculating the area of a rectangle
- Calculating the area of circle
- Displaying the result

20 Marks for identifying these problems

30 Marks for coding appropriate solutions

3. Point in square problem.

A number of solutions but the basic solution is to compare the left and right hand sides of the rectangle with X, and the top and bottom sides with Y.

The students should infer that $Right = Left + width - 1$ and $Bottom = Top - width - 1$.

This requires two tests, one on the horizontal and the other on the vertical

One approach is to test if the point is outside the square by checking that :

$(X < Left \parallel X > Right \parallel Y < Bottom \parallel Y > Top)$

Alternatively, X and Y must be checked to see if they fall within the bounds of the rectangle.

$(X \geq Left \ \&\& \ X \leq Right \ \&\& \ Y \geq Bottom \ \&\& \ Y \leq Top)$

The student may simplify this into comparing just one dimension i.e. left and right.

20 Marks

Code may look like this:

```
struct Point
{
    int x;
    int y;
};

int InputNumber(string prompt)
{
    string input;
    stringstream stream;
    int number;

    cout << prompt;
    getline(cin, input);
    stream.str(input);
    stream >> number;
    stream.clear();

    return number;
}

bool PointInRectangle(struct Point point, int left, int right, int top, int
bottom)
{
```

```

    if (point.x < left || point.x > right || point.y > top || point.y < bottom)
        return false;
    else
        return true;
}

int main(int argc, char *argv[])
{
    string input;
    stringstream stream;
    struct Point topLeft;
    int width;
    struct Point point;

    cout << "Please enter top left" << endl;
    topLeft.x = InputNumber("X: ");
    topLeft.y = InputNumber("Y: ");

    width = InputNumber("Width :");

    cout << "Please enter the point:" << endl;
    point.x = InputNumber("X: ");
    point.y = InputNumber("Y: ");

    if (PointInRectangle(point, topLeft.x, topLeft.x + (width-1),
        topLeft.y, topLeft.y - (width-1)))
    {
        cout << "In rectangle" << endl;
    }
    else
    {
        cout << "Outside rectangle" << endl;
    }

    cin.get();
    return 0;
}

```

Marks 10

Diwedd/End