

VERTRAULICH

AUFGABENSTELLUNG PROBE-IPA 2018

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1 Aufgabenstellung

Aufgabenstellung Modul 223 nach PkOrg

1.1 Projekt

Projekttitel:	Just Muesli
Im Auftrag von:	Remo Steinmann Modul 223
Auftragnehmer:	Fabrice-Ronny Bosshard
Starttermin:	31. Oktober 2018
Abgabetermin:	09. November 2018
Geplanter Projektaufwand:	5 Arbeitstage à 6 Stunden (30h)

Erstellung einer Multi-User-Applikation, mit Frontend, Backend und Anbindung an eine relationale Datenbank.

1.2 Ausgangslage

Die Aufgabenstellung existiert bereits aus den Informatik-Schweizermeisterschaften vom Jahr 2018 (ICT Skills 2018). Sie wurde für dieses Modul angepasst, um den Anforderungen an die Applikation zu entsprechen (siehe 1.6 Anforderungen an die Applikation).

Das Projekt wird von Grund auf aufgebaut und implementiert. Der Auftragnehmer muss neben den Standard .NET-Kenntnissen auch solide Kenntnisse in Entity Framework und WPF (Windows Presentation Foundation) haben.

Die Struktur der Dokumentation soll bereits als Vorlage existieren, damit bei Projektbeginn direkt mit dem Schreiben angefangen werden kann.

1.3 Aufgabenstellung

Im Anhang finden sie die detaillierte Aufgabenstellung der ICT-Skills Schweiz. Sie beschreibt die funktionalen Anforderungen an die Applikation und gibt durch Wireframes vor, wie das Layout der Benutzeroberfläche aussehen muss. Es existieren neben Benutzerfreundlichkeit keine weiteren Kriterien für das Styling der Applikation.

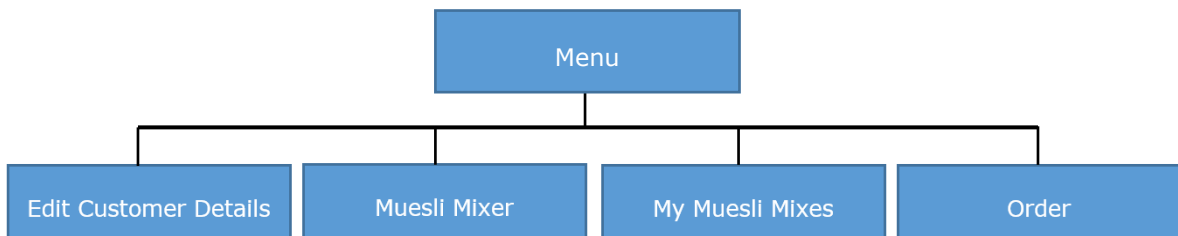
1.3.1 Management Summary

Kurze Repräsentation der Aufgabenstellung von ICT-Skills Schweiz.

„Just Muesli“ ist eine neu gegründete Firma welche sich als Ziel gesetzt hat, allen Kunden ein perfektes, konfigurierbares Muesli bieten zu können. Die Kunden können sich selber, aus einer Auswahl von Zutaten, Muesli online erstellen. So wird ermöglicht, dass man unzählige einzigartigen Muesli für jeden Benutzer erstellen kann.

1.3.1.1 Applikationsstruktur

Das folgende Diagramm zeigt die verschiedenen Teile der Applikation. Jeder Knoten repräsentiert ein Fenster, welche jeweils im Anhang (Aufgabenstellung ICT-Skills) detailliert beschrieben werden.



1.4 Technologie-Stack

IDE: Visual Studio 2017 (mit ReSharper)
Database: SQLite mit Entity Framework
Front- / Backend: C# 7.0 mit Windows Presentation Foundation (WPF)
Testing: NUnit

Programmarchitektur wird nach MVVM (Model View ViewModel) umgesetzt.

1.5 Firmenstandards

Für Qualitätssicherheit und Vulnerabilitätsüberprüfung wird SonarQube verwendet. Als Dokumentationsstandard gibt es bei der Atos ein spezielles Template für Reports. Dieses Template gibt Layout, Schriftarten, Farben, Kopf- / Fußzeilen und Absätze vor.

1.6 Anforderungen an die Applikation

Folgende Anforderungen müssen von der Applikation erfüllt werden:

- Multi-User-Applikation
- Relationale Datenbank
- Objektorientierte Programmierung
- Mehrere Clients müssen gleichzeitig auf den gleichen Datenbestand zugreifen
- Transaktionssicherheit muss gewährleistet werden
- Zentrale Datenbank

1.6.1 Zusätzliche Kriterien

Während der Arbeit müssen weiterhin folgende Kriterien beachtet werden:

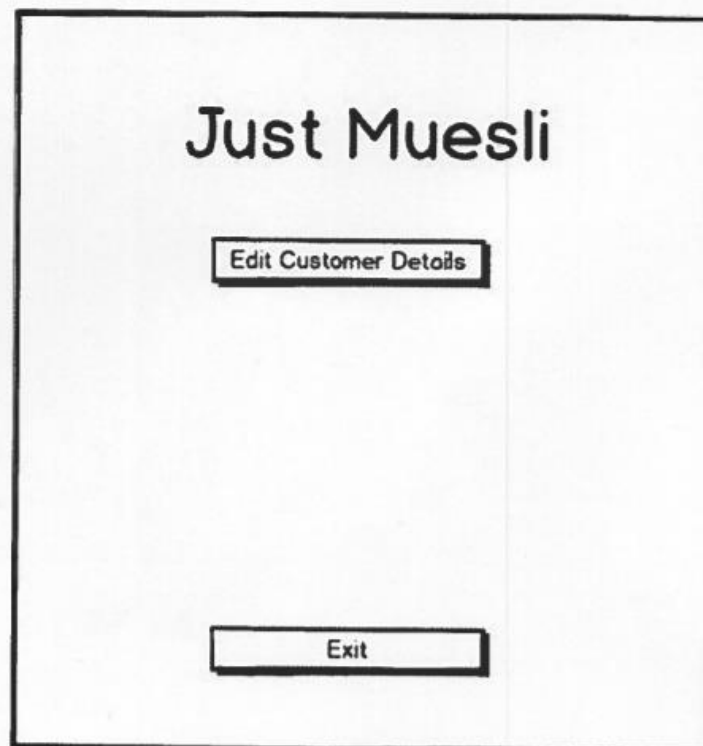
- 225 Versionsverwaltung mit Verwaltungs-SW
- 235 Entwurf mit UML
- 166 Codingstyle – lesbarer Code
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2 Anhang

ICT-Skills Schweiz Aufgabenstellung 2018

7 Menu (Part 1)

After launching the application, a menu should be displayed. This menu allows the user to access the other parts of the application. Please create the window according to the following mockup and description. This menu will be extended with more options in Part 2.



- This menu (window) is displayed after launching the application.
- The Button "Edit Customer Details" should open the window described in the next chapter.
- The button "Exit" terminates the application.

8 Edit Customer Details

This window is used to manage the details of the customer. Please create the window according to the following mockup and description.

- This window is accessible by the button "Edit Customer Details" on the main menu.
- The user should be able to manage the following data: name, address, zip, city, country, phone and email. Please use appropriate edit controls.
- Use the imported list of countries from the file "Countries.txt".
- To avoid erroneous entries, the data should be validated according to the validation rules below.
- The button "Save" stores the data in the database. Saving should only be possible, if there are no violations of validation rules. An error message, that mentions all invalid fields, should be shown if invalid data has been entered.
- The button "Back to menu" leads back to the main menu.

Field	Validation rule
Name	Length: min 5 characters
Address	Length: min 5 characters
Zip	Length: min 4 characters, only numeric values (0-9)
City	Length: min 2 characters
Country	A country from the provided list must be selected
Phone	Length: min 10 characters, only numeric values, blanks or "+"
Email	Pattern: <u>x@y.z</u> x: min 1 character y: min 3 characters z: 2-3 characters (only [a-zA-Z])

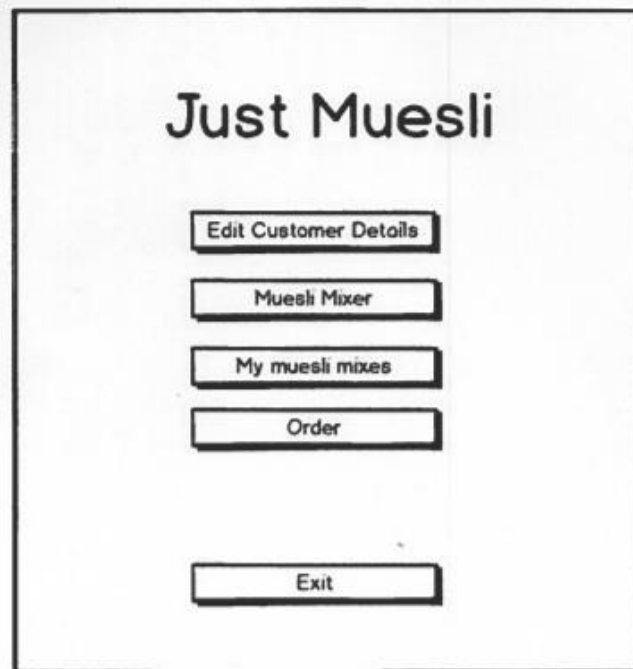
PART 2



- You can start working on part 2 anytime during the competition.
- Assessment of part 2 starts as soon as the competition has finished.
- Please adhere to the style guide when designing user interfaces.

9 Menu (Part 2)

Please extend the Menu by adding the additional buttons shown in the mockup.



- In the end, all buttons should lead to the correct part of the program according to the following chapters.
- The button "Order" should be disabled, if no saved muesli mix exists.

10 Muesli Mixer

This window is used for the core of the application: an innovative muesli mixer. It serves to create individualized muesli mixes out of many components. Please create the window according to the following mockup and description.



What is a "muesli mix"?

A muesli mix always consists of a base component (anything from category "Basics") and up to twelve additional components. The base component must always be added first. The components belong to the following categories: Basics, Cereal, Fruit, Nuts & Co, Choco, Specials.

The total weight of a muesli is always 600g. The base component acts as a «filler», whose amount is calculated automatically (600g – [Total weight of additional components]).

Just Muesli

Muesli Mixer

Basics
Cereals
Fruits
Nuts & Co
Choco
Specials

Cornflakes
Price: CHF 4.55
Portion Size: 600g
[More information](#)
[Add to muesli](#)

Good Morning
Price: CHF 4.55
Portion Size: 600g
[More information](#)
[Add to muesli](#)

Knights Blend
Price: CHF 4.55
Portion Size: 600g
[More information](#)
[Add to muesli](#)

Oat Crunchies
Price: CHF 5.20
Portion Size: 600g
[More information](#)
[Add to muesli](#)

Porridge Oats
Price: CHF 4.55
Portion Size: 600g
[More information](#)
[Add to muesli](#)

Name:

(empty)
 (empty)
 (empty)
 (empty)
 (empty)
 (empty)
 (empty)
 (empty)
 Cashew nut
 Speltcrunchy
 Cornflakes
 Cranberries
 Strawberries
 Porridge Oats

TOTALS:
Price: 11.50 CHF/600g
Nutritional values: 352 kcal/100g
[Details](#)

- This window is accessible by the button "Muesli Mixer" on the main menu.

10.1 Component list (left side)

- There should be a tab for each category containing a list of all corresponding components from the database. The list should be sorted ascending by name.
- The following information should be visible for each component in the list: name, price, weight of the portion.
- The user should be able to add a component to the muesli mix by clicking a link or button "Add to muesli". If the muesli mix already contains 12 components in addition to the base component, an error message should be shown instead.
- Only one base component can be added to the mix. When the user tries to add another base component, it should replace the existing one. The base component must always be added first.
- The button "Back to menu" leads back to the main menu.
- The button "More information" should open a popup window that displays the ingredients, nutrients and energy content of the component. Use the table from chapter 10.3 to calculate the energy content.

More Information

Knights Blend

Ingredients

Einkorn flakes, emmer, spelted flakes, wheat flakes

Energy Content per 100g

Energy Content	321 Kcal / 1342 KJ
Protein	12g
Carbohydrates	61.7g
Fat	2g

Close

10.2 Current muesli mix (right side)

- The chosen components should be displayed "stacked" according to the adding order, but the base component should always be placed right at the bottom.
- An error message should be shown if the total weight (600g) is exceeded by the current muesli mix.
- The total price (in CHF per 600g) and the nutritional values (in kcal per 100g) of the current muesli mix should be automatically calculated based on the selected components and displayed. Please take care of the following points for the calculation:
 - The price for the basic component is based on a portion size of 600g. Since the portion size is determined automatically, the price must also be adjusted accordingly. The price must be rounded to the second decimal place (0.01).

- Nutritional information (e.g. carbohydrate content) in the import file are given per 100g of the component. The values must be converted to the portion size if necessary.
- The user can remove a component from the mix by clicking on this component in the muesli stack. A confirmation prompt should be shown to ask if the user really wants to remove the component.
- To help the user distinguish his muesli mixes later, the user should be able to assign a name and save his current mix. The button **"Save Muesli"** stores the muesli mix in the database. A meaningful error message should be shown in the following situations:
 - No muesli name has been entered.
 - No basic component has been chosen.
- Additional nutritional details should be provided for the health-conscious users. After clicking the button **"details"**, a detailed breakdown of the nutrients should be shown in a separate window (proteins, carbohydrates, fats in kcal and KJ per 100g muesli). Please use the table below to calculate these values.

Details	
Energy Content per 100g of the Current Muesli Mix	
Energy Content	321 Kcal / 1342 KJ
Protein	12g
Carbohydrates	617g
Fat	2g
Close	

10.3 Calculation of the energy content

Use the fat, carbohydrate and protein content of the components to calculate the energy content using this conversion table.

1 Kcal = 4.184 KJ

Nutrient	Kilocalories per gram [Kcal/g]	Kilojoules per gram [KJ/g]
Carbohydrates	4.1	17.2
Proteins	4.1	17.2
Fats	9.3	38.9

11 My muesli mixes (Edit Muesli)

This window is used to manage the saved muesli mixes of the customer. Please create the window according to the following mockup and description.

The mockup shows a window titled "Just Muesli" with a subtitle "My muesli mixes". Inside the window is a table with the following data:

Name	Price / 600g	Created on
Apple Muesli	CHF 13.50	17.07.2018
banana	CHF 12.00	05.05.2018
My muesli	CHF 18.70	29.08.2018
Superduper	CHF 15.00	07.09.2018

Below the table are three buttons: "Back to menu", "Edit", and "Delete".

- This window is accessible by the button "My muesli mixes" on the main menu.
- All saved muesli mixes from the database should be listed in a table containing the name, price and date of creation in separate columns.
- The table should be sorted ascending by name, but the user should be able to sort the table by other columns too.
- The button "Edit" opens the window "Muesli Mixer" to edit the selected muesli mix.
- The user can remove the selected muesli mix by clicking on the button "Delete". A confirmation prompt should be shown to ask if the user really wants to delete the mix.
- An error message should be shown if the user clicks "Edit" or "Delete" and no muesli mix is selected.
- The button "Back to menu" leads back to the main menu.

12 Order

This window is used to order saved muesli mixes. Please create the window according to the following mockup and description.

Name	Size	Price	Quantity	Total
My muesli	<input type="checkbox"/> XXL	CHF 18.70	0	CHF 0.00
Superduper	<input type="checkbox"/> XXL	CHF 15.00	2	CHF 30.00
Apple Muesli	<input type="checkbox"/> XXL	CHF 13.50	1	CHF 13.50
banana	<input checked="" type="checkbox"/> XXL	CHF 48.00	0	CHF 0.00

Back to menu

Submit order

Muesli mixes: CHF 43.50

Shipping: CHF 6.00

Taxes: CHF 1.25

Grand Total: CHF 50.75

- This window is accessible by the button "Order" on the main menu.

12.1 Muesli mix list (left side)

- All saved muesli mixes from the database should be listed containing the name and price (sorted descending by price per 600g).
- The button "Submit order" is disabled, when no muesli mix is ordered (Quantity = 0 for all muesli mixes)
- The user should be able to order a large version by selecting the XXL option of a muesli mix. The XXL size has a weight of 2'400g and thus the displayed price will be increased to the fourfold.
- The user should be able to enter the desired quantity for each muesli mix.
- Each row should end up with a subtotal (displayed price * quantity).
- The button "Back to menu" leads back to the main menu.

12.2 Costs (right side)

- The order total ("Muesli mixes") corresponds to the sum of all subtotals.
- The shipping costs within Switzerland are usually CHF 6.00 and for shipping abroad CHF 8.00. If the order total (costs of ordered Muesli mixes) exceeds CHF 50.00, no shipping fee is charged.
- If the order will be shipped abroad, no tax will be added to the order. For Swiss customers, an additional 2.5% tax will be charged and added to the grand total (rounded to the nearest CHF 0.05).
- The text boxes showing the costs must be read-only.

- When the user clicks the button "Submit order", an order confirmation file should be created. The detailed requirements are defined in the next chapter. Please note that it is not required to save the order in the database.

13 Order Confirmation

The order confirmation should be created as a text file, which is formatted like the following example:

```

1 Dear [Name]
2
3 Thank you very much for using JustMuesli to order your personal Muesli
4
5 Order overview
6
7 Item                Size      Price  Quantity  Total
8 -----
9 Superduper          Normal    15.00      2     30.00
10 Apple Muesli        Normal    13.50      1     13.50
11 bananaana           XXL       48.00      1     48.00
12 -----
13 Total Muesli mixes                91.50
14 Shipping                                0.00
15 Taxes                                2.30
16 =====
17 Grand Total                                93.80
18 =====
19
20
21 The ordered items will be sent to the following address:
22 [Name]
23 [Address]
24 [Zip] [City]
25 [Country]

```

The order confirmation should be saved in the working directory of the executable. Use the filename "orderconfirmation.txt" (existing order confirmation file should be overwritten).

Placeholders enclosed in brackets (e.g. [Name]) must be replaced by the actual customer data. The order overview table must contain the ordered items (name, size, price, quantity and calculated line total), total cost of muesli mixes, shipping fees, taxes and the grand total. The columns of the table must be formatted as follows:

Column	Size (number of characters)	Format	Alignment
Item	25	Text	Left
Size	7	Text	Left
Price	10	Number with 2 decimal places	Right
Quantity	10	Number with no decimal places	Right
Total	14	Number with 2 decimal places	Right

Use spaces to pad the data and achieve the desired alignment. You can assume that no data will be used that exceeds the defined size.