1. Flowcharts representing functions of the programme
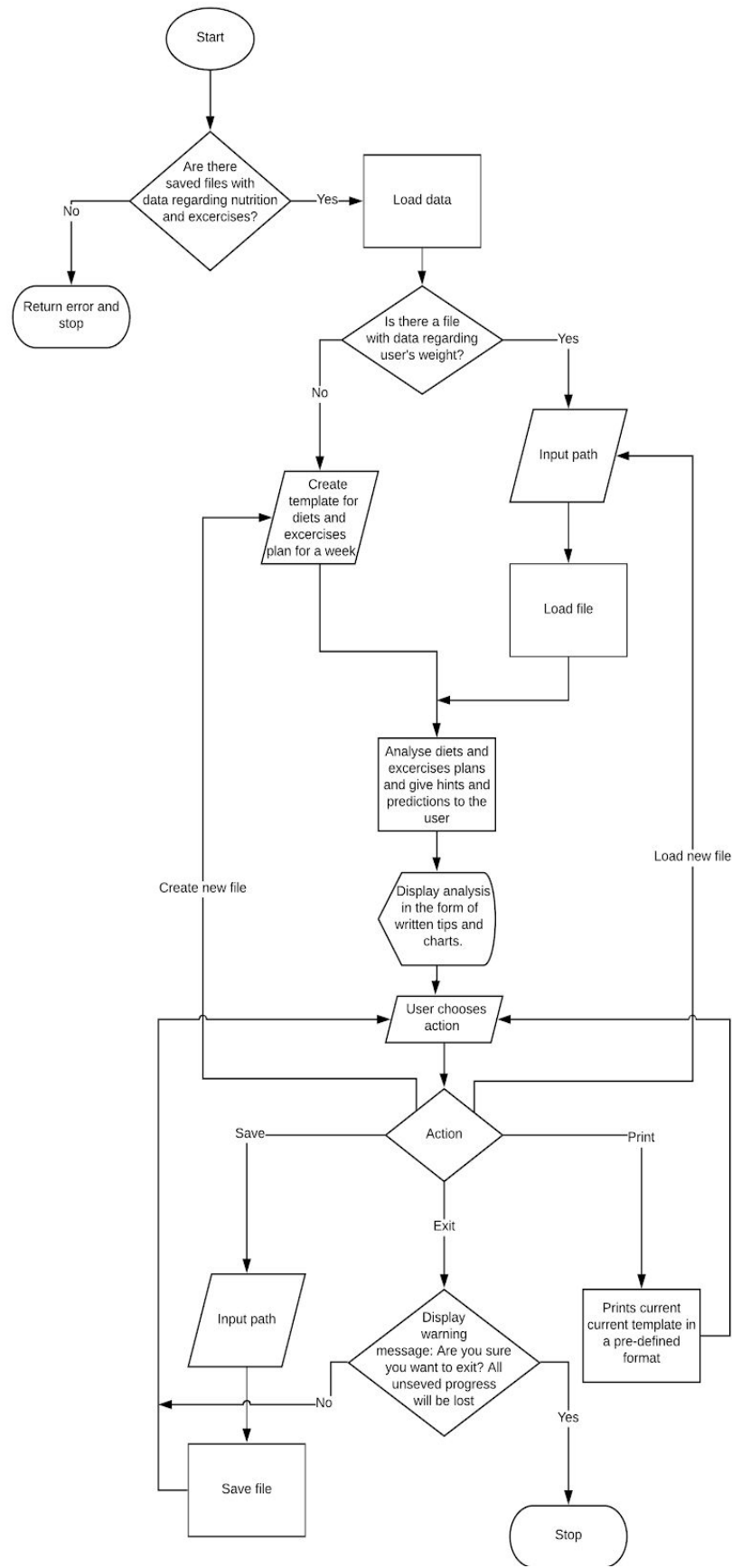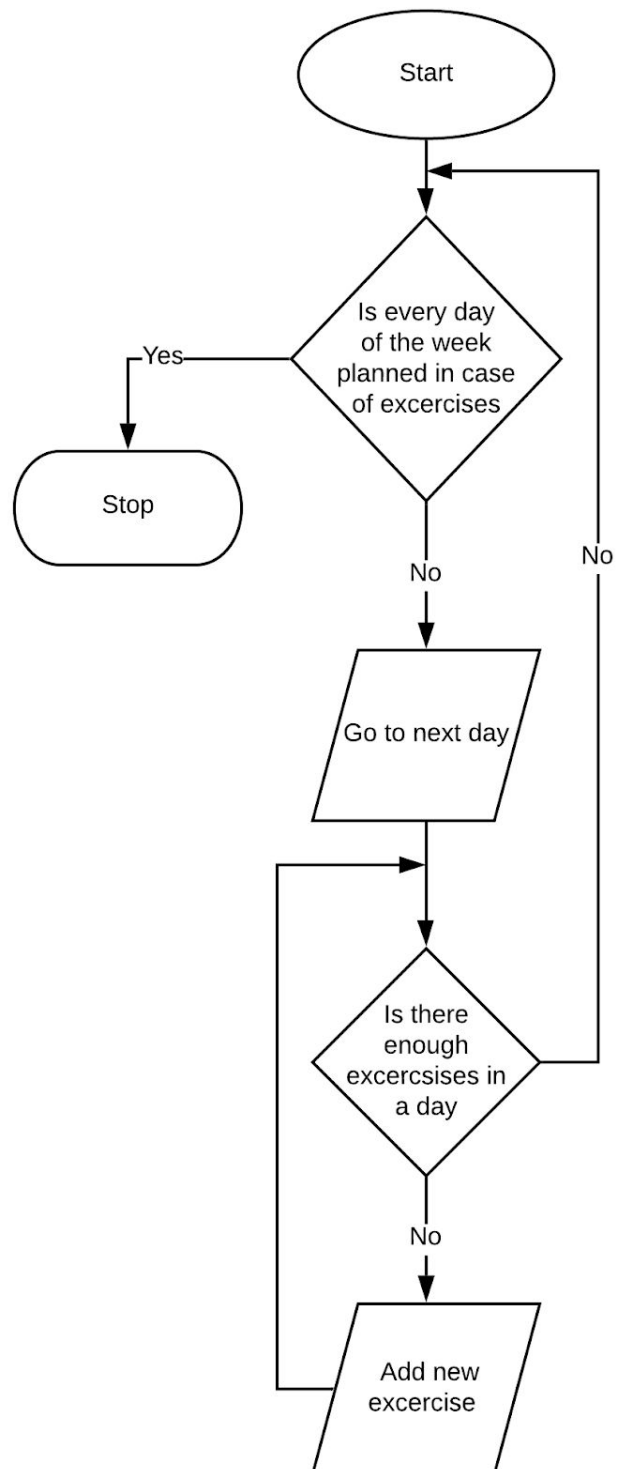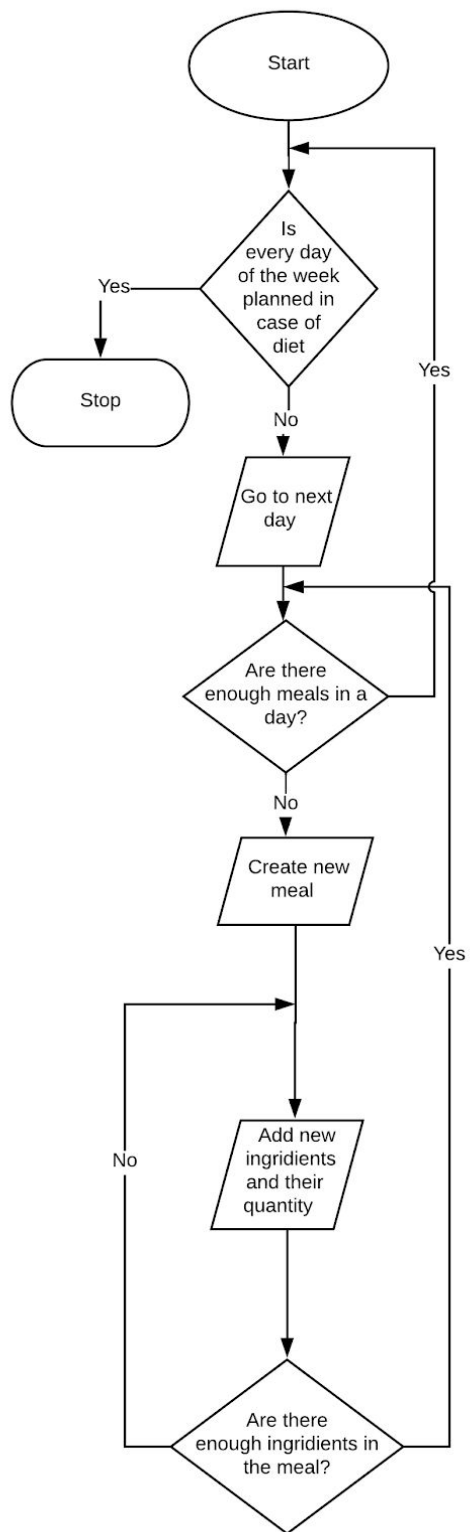
1.1 General use of the programme

1.2 Method of managing exercises

```
                              ┌──────────┐
                              │  Start   │
                              └────┬─────┘
                                   │
                                   ▼
                              ╱──────────╲
                             ╱ Is every day ╲
                  Yes ──────╱ of the week     ╲◄──────────┐
                   │         ╲ planned in case ╱            │
                   ▼          ╲ of excercises ╱             │
              ┌─────────┐       ╲──────────╱                │
              │  Stop   │            │                      │
              └─────────┘            │ No                No │
                                     ▼                      │
                              ╱────────────╲                │
                             ╱ Go to next   ╱               │
                            ╱   day        ╱                │
                           ╱────────────╱                   │
                                │                           │
                    ┌───────────┤                           │
                    │           ▼                           │
                    │      ╱──────────╲                     │
                    │     ╱ Is there    ╲                   │
                    │    ╱   enough       ╲─────────────────┘
                    │    ╲ excercsises in ╱
                    │     ╲   a day      ╱
                    │      ╲──────────╱
                    │           │
                    │           │ No
                    │           ▼
                    │      ╱──────────╲
                    └─────╱ Add new    ╱
                         ╱  excercise ╱
                        ╱──────────╱
```

1.3 Method of managing nutrition

```
                    ┌─────────────┐
                    │    Start    │
                    └──────┬──────┘
                           │        ┌──────────────┐
                           ▼        │              │
                      ╱─────────╲   │              │
                     ╱   Is      ╲  │              │
                    ╱ every day   ╲ │              │
          Yes──────╱ of the week   ╲              │
                   ╲ planned in    ╱ Yes          │
    ┌─────────┐    ╲  case of     ╱  │            │
    │         │     ╲   diet     ╱   │            │
    │  Stop   │      ╲─────────╱     │            │
    │         │          │No         │            │
    └─────────┘          ▼           │            │
                   ┌───────────┐     │            │
                   │Go to next │     │            │
                   │    day    │     │            │
                   └─────┬─────┘     │            │
                         ▼           │            │
                    ╱─────────╲      │            │
                   ╱ Are there ╲─────┘            │
                  ╱ enough meals╲                 │
                  ╲  in a day?  ╱                  │
                   ╲──────────╱                   │
                        │No                        │
                        ▼                          │
                  ┌───────────┐                    │
                  │Create new │                    │
                  │   meal    │                 Yes│
                  └─────┬─────┘                    │
                        │                          │
          ┌─────────────┘                          │
          │                                        │
          │         ┌───────────┐                  │
          │         │ Add new   │                  │
        No│         │ingridients│                  │
          │         │ and their │                  │
          │         │ quantity  │                  │
          │         └─────┬─────┘                  │
          │               ▼                        │
          │          ╱─────────╲                   │
          │         ╱ Are there ╲──────────────────┘
          └────────╱enough ingridients╲
                   ╲ in the meal? ╱
                    ╲───────────╱
```

2. First design of the panels

2.1 Start panel

Tabs: Info + Monday-Sunday + Summary
Introduction for the programme for the user and quick instruction manual

List of input field for numerical data by the user	Set data button

2.2 Day panel

Tabs: Info+ Monday-Sunday + Summary							
List of Meals	Add meal button	Save button				Add excercise plan button	List of excercise plans
	Summary of meals	Tips for meals	Summary of the day	Tips for excercise plans		Summary of excercises	

2.3 Summary panel

Tabs: Info + Monday-Sunday + Summary

Summarise button

Summary

Tips

Chart predicting the effects

2.4 Search and add panel

Search bar

Results

List of components of the object (meal, excercise plan)
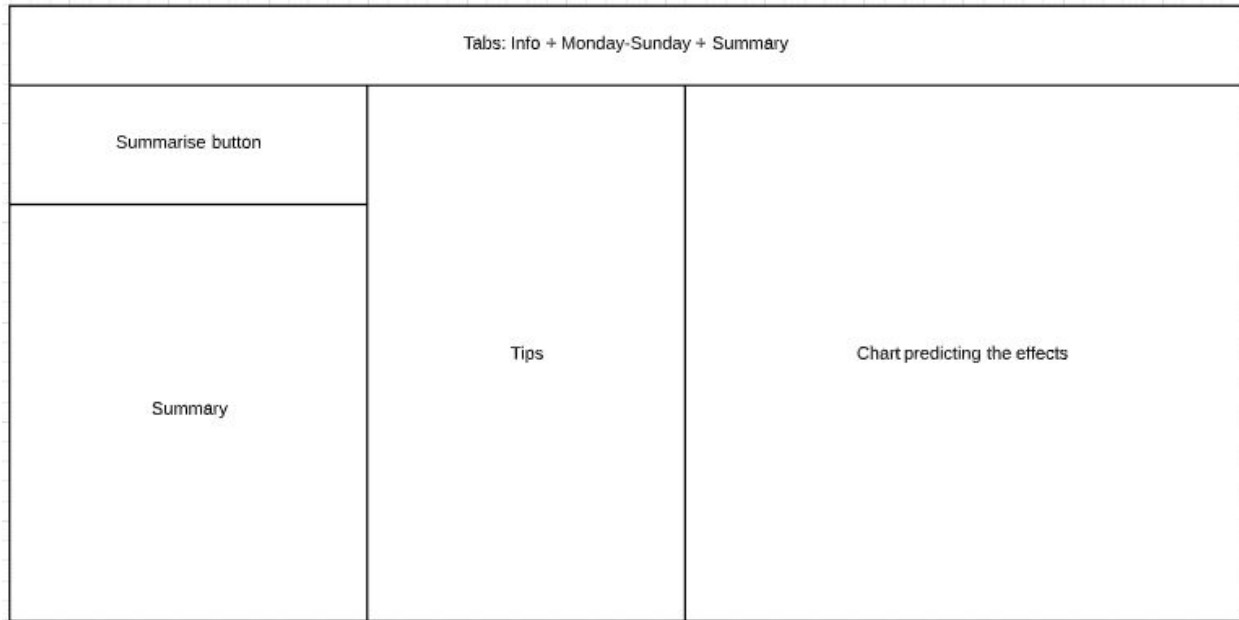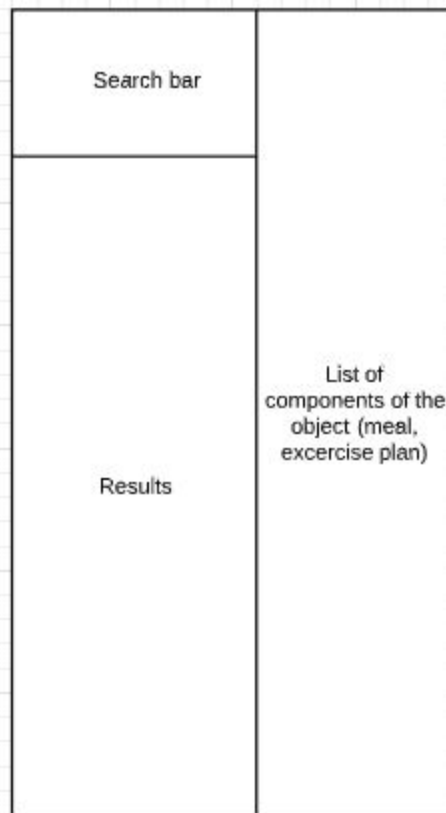
3. Improved design of the panels

3.1 Start panel

Tabs

Introduciton to the programme and qucik manual

Numerical fields for data input	Confrim button

3.2 Day panel

Tabs			

	Add rneal button	Rernove rneal button	Rernove excercises plan button	Add excercise plan	
Meal list	Numerical fields regarding nutrition	Tips	Numerical fields regarding excercises		Excercise list
			Save day button		
			Load day button		
	Save shopping list button		Clear button		
			Go to analysis tab button		

3.3 Summary panel

Tabs			
List of days in a period	Add day button	Save period button	Chart
	Remove day button	Load period button	
	Save shopping list		
	Analyse		Tips and chart summary
Clear list	Clear analysis		

3.4 Search and add panel

Search bar		Remove item button	
List of items to choose from	Add item button	List of items to choose from	Finalise button

3.5 Shopping list panel

```
┌─────────────────────────────────────────┐
│                                         │
│                                         │
│                                         │
│           Shopping list view            │
│                                         │
│                                         │
│                                         │
├──────────────┬──────────────┬───────────┤
│              │              │           │
│ Save to file │    Print     │   Exit    │
│              │              │           │
└──────────────┴──────────────┴───────────┘
```

4. Data structures

-Arrays: To store data regarding nutrition and exercises. It is optimal as the number of data is known and searching through the array may be in some cases the fastest.
-Lists: To store objects of "Meal", "ExercisePlan" and "Day" classes that can be easily changed and customised using this data structure.

5. Forms of outputs

5.1 For end-user
-Shopping list in the following form :

```
Breakfast:
Ingridient1 50g
Ingridient2 100g

Second Breakfast:
Ingridient3 100g
Ingridient4 25g
Ingridient5 40g
Ingridient6 30g
Ingridient7 200g

Lunch:
Ingridient8 300g
Ingridient9 50g
Ingridient10 50g
```

There will be a possibility to print a daily shopping list or for a period. Each list will include the name of the meals,a list of their ingredients and the weight of those ingredients.

-Tips in the final analysis of the weekly diet ex. Too much fat, too little protein.
-Conceptional chart representing the estimated effects of the diet over time.
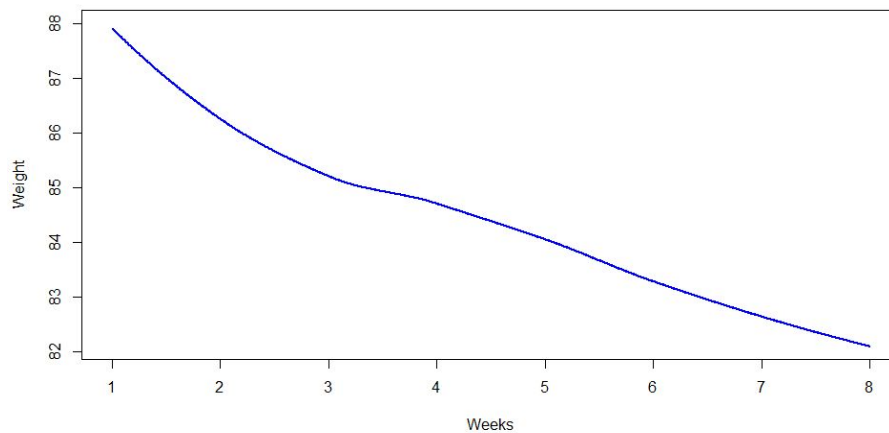
5.2 For the programme

-Saving and loading numerical personal data.
-Saving and loading daily plans and weekly plans by the end-user to access them later.

6. UML diagram

In order to intelligibly present the classes and connections between them a specification UML diagram was created and is shown below. For clarity accessor methods and GUI classes were omitted.
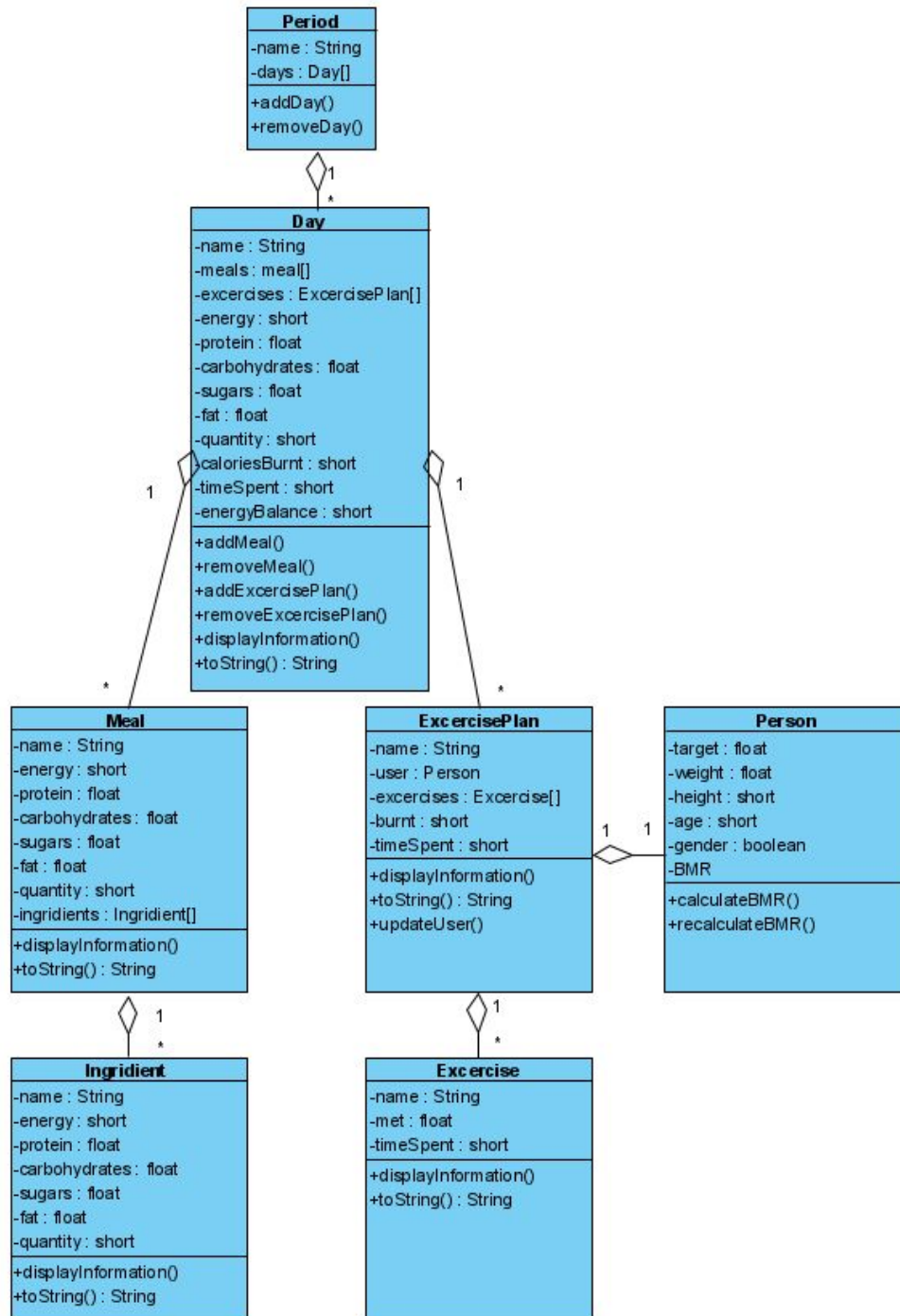
7. Testing poprawić

Tested feature	Test method	Desired effect
Input of personal data .	Input body height, weight and age of a person.	The data is saved, stored in a file and used to make calculations after the user confirms it with a button. The user is unable to input abnormal data. The user is taken to the planning period.
Creating meals and exercise plans.	Create a few sample meals and exercise plans.	The meals and plans are created and shown on the lists and their total nutritional information is stored in numerical fields. The tips are updated.
Creating and saving files containing daily and weekly plans.	Create sample plans and save them to a specific location on the computer.	Files exist with an appropriate file extension.
Reading from files containing daily and weekly plans.	Load files from the previous test if it was successful .	Files are loaded. The meals and plans are loaded and shown on the lists and their total nutritional information is stored in numerical fields. The tips are updated.
Saving shopping list.	Create a shopping list from loaded files and save it to a specific location on the computer.	The list is saved with a txt extension and specific appropriate format. If there are no meals, inform the user they need to create them.
Printing shopping list	Create a shopping list from loaded files and print it without creating a file on the computer. The computer is connected to a printer.	The shopping list is printed with appropriate format.

Removing meals and exercise plans.	Click on the meal or exercise plan on the list and then click the "remove meal" or "remove exercise" button respectively.	The meal or exercise plan is removed from the list, the tips and numerical fields are updated.
Clearing the day plan.	Click the "Clear" button when there are some days and exercise plans loaded.	All lists, tips and numerical data are cleared.
Going to "Analyse" tab.	Click the "Analyse" button.	The user is taken to the "Analyse" tab.
Adding days to a period.	Load days from files.	Days are added to the period and displayed on the list.
Saving period.	Saving the period consisting of loaded days.	Period is saved with the appropriate extension.
Loading period.	Load the days from a chosen period stored in a file.	Days are added to the period and displayed on the list.
Removing day.	Remove the day object from the list of days in a period.	The day is removed from the list.
Clearing list.	Clearing the list.	All days are removed from the list.
Saving shopping list	Create a shopping list from loaded files and save it to a specific location on the computer.	The list is saved with a txt extension and specific appropriate format. If there are no days, inform the user they need to load them.
Analysing the period	Analysing the period when: a) there are no days in period b) when there are days in period c) when the period was already analysed	a) Nothing happens b) The period is analysed, the graph displays predicted effects, word summary of the chart and tips is displayed in a text area c) The new period is analysed and overrides the chart and text field

Clearing analysis	Click "Clear analysis" after successful analysis	Chart and text in textfield disappears.

8. External resources to be used

-"The compendium of physical activities tracking guideline":
http://prevention.sph.sc.edu/tools/docs/documents_compendium.pdf

-"FNDDS Documentation and Databases from U.S. Department of Agriculture"
https://www.ars.usda.gov/northeast-area/beltsville-md-bhnrc/beltsville-human-nutrition-research-center/food-surveys-research-group/docs/fndds-download-databases/

-The BMR of the user will be calculated using Harris-Benedict equation
Mifflin MD, St Jeor ST, Hill LA, Scott BJ, Daugherty SA, Koh YO. A new predictive equation for resting energy expenditure in healthy individuals. Am J Clin Nutr. 1990 Feb;51(2):241-7. doi: 10.1093/ajcn/51.2.241. PMID: 2305711.