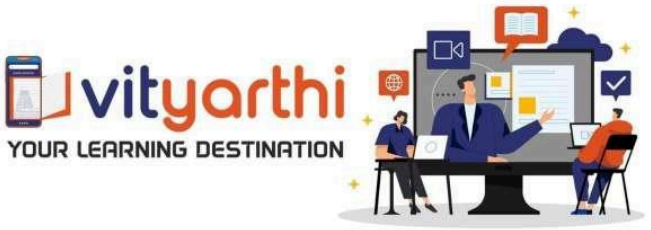
# VITYARTHI – PROJECT




**Project title : Effective Shopping Assistance**

**Course title : Introduction to problem solving and programming**

**Course code : CSE 1021**

**Course type : Flipped course**

**Course credits : 4**

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**Slot : C14 + E11 + E12**

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## INTRODUCTION :

The “Effective Shopping Assistance” is an AI assistance that allows the user who is visiting the shop to get a clear example of all the food items in the shop with the price of the food item and the calorie content of each food item in the shopping cart. This AI first knows what the user wants to do in the shop and do the needings as per the user's choice.This AI helps the users to do shopping effectively and ensures that the shopping made by all the users are not time consuming. It also ensures that the user is fulfilled with the purchase made by him and the user is satisfied on visiting the shop.

The AI will take all the input required by it from the user into account like choice of menu, choice of category, choice of product in the category etc. and it will generate all the required information according to the users inputted choice.This project is done in “python programming language” as this language is easy to learn and the syntaxes used are easily understandable by human beings. This AI is programmed to be an easy use for all who are visiting the shop to buy and edibles, with very simple instructions to guide the user.

The “Effective Shopping Assistance” is a project that shows the application of programming knowledge in the python programming language which I learnt in solving a real life problem.This AI ensures that the user can keep a track on the products through the entire shopping .

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## PROBLEM STATEMENT :

Write a program to develop a console-based python that acts as an effective shopping assistance.This program should allow the user to view the products available in the shop, add the products required by the user in their respective shopping carts,to allow the user to know the amount of calorie present in the product, to know the total price of all the products that are present in the user's shopping cart.

## PROJECT OBJECTIVES :

- Creating an AI for all the users visiting the shop to keep a look on the items selected.
- Applying the programming concepts such as functions, loops, Data types, etc learnt from this course in creation of the calculator.
- The AI must be easy and simple for the users to use and shop efficiently
- The AI should be user-friendly to the user.
- It must provide the output according to the user's wish that he wants to do in the shop.

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## FUNCTIONAL REQUIREMENTS:

1. User-System Interaction :
   - The AI provides a user-friendly environment for the user to shop efficiently and effectively.
   - The instructions are simplified and made so that it will guide the user throughout the process.
   - The system shows all the available operations that can be performed by the user and asks the user to enter the choice of his/her own and perform accordingly, and after each task the system asks the user to continue shopping or to exit from shopping.

2. Data Input :
   - The system allows the user to enter their own choice according to their preference.
   - The system allows the user to choose under which category of products that the user want to add in their shopping carts
   - The program is a menu driven which contains many user defined functions and asks the user to enter a choice and according to the choice the respective function is called.

3. Data processing :

   - Category viewing :

     First the user want to know about the clear idea about what are all the categories of items are present in the shop and should take decisions accordingly

- Browsing Products:

  After the user decides under which category he/she wants to buy the products the system will list down all the products that comes under the chosen category by the user's choice

- Adding Products:

  After listing down the products then the user can choose which product he/she is preferring to buy and adds the product in the user's shopping cart. The user can also add different products from different categories by choosing the same number entered to add the products in the shopping cart.

- Viewing The Product:

  After the Product is added to the user's shopping cart the user is capable of viewing the cart to check whether the right product is added to the category.

- Removing The Product:

  When the user is viewing the cart and finds if a specified item is not required then the system allows the user to remove the product permanently from the user's shopping cart.

4. Output:
   - The system first displays all the possible operations that can be done and asks the user to input an integer value so that according to the choice of the user the respective operations will be performed.

- After the choice is entered by the user the system checks whether the inputted choice comes under the default boundary set by the system and if the choice is not inside the boundary then the system will display “invalid input”and again asks the user to input a choice within the system’s default boundary.

5. Data Storage
   - The data inputted by the user is stored in the system so the system can call the respective function according the user’s choice and the function is performed as per the user’s wish.

## NON-FUNCTIONAL REQUIREMENTS :

1. Performance :
   - The system shall respond with the categories and respective products to the user’s inputs within a couple seconds.
   - The system can handle as many as functions that the user calls until the choice of exit is given.

2. Security :
   - The system will not hold / store any sensitive data of the user.
   - The system shall be secure against all the common web vulnerabilities.

3. Usability :
   - The system is made to be simple and easy for the user to use and the set of instruction will guide the user throughout their shopping time.

4. Reliability :
   - This AI can be used any time by the user when and all the assistance is required
   - And the system can be accessed anywhere around the world with a python code executer.

5. Maintainability :
   - The system is written with a maintainable and understandable code with comment lines.
   - The system has proper documentation so that it can be updated in the coming future.

6. Error handling :
   - If the system detects any error in the inputs entered by the user it displays an error message and requests' the user to try entering the inputs again.

7. Resource efficiency :
   - The system is designed to minimise power consumption and optimize battery life.
   - The system shall require less than 5MB(Megabyte) of storage space for optimised running.
   - The system doesn't require any network bandwidth so it can be accessed even in places without proper internet connection.

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## SYSTEM ARCHITECTURE :

- The presentation layer is built using Spyder, where the inputs are accepted from the user.
- Application layer is where the input data is processed and the operations are performed  then the outputs are stored and displayed as soon as possible.
- A data layer is a storage space where the user inputs and the output values are stored.
- Output renderer is a dynamic area that shows all results including categories, products, shopping cart and indicates errors.

## DESIGN DIAGRAM :

1. Workflow :

display of categories

⬇

user’s choice

⬇

display of products in the mentioned category

⬇

adding in the user’s shopping cart

⬇

displaying the total price

- This work flow may change as this is a menu driven and it totally depends on the user’s wish.

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2. Data flow Diagram :

   There won't be a standardised flow diagram for the system as the flow is totally the user's choice which can be done by them by just entering integer values according to their wish.

3. Component diagram :
   - Input form : Integer value
   - Validation module : Checks the value is within range
   - Calculation core : computes as per the inputted value by the user
   - Output display : Presents the results

## DESIGN DECISIONS & RATIONALE :

1. Programming language : Python
- Rationale : Python is a simple, easy to learn language with a large number of libraries and frameworks, making it idle for small projects like this.

2. User interface ; Spyder
- Rationale : A simple UI is sufficient for this program so Spyder is chosen which provides an interactive environment for users to input data and view results.

3. Data storage : In-memory data storage
- Rationale : Since the project doesn't require any explicit data storage, in-memory storage is sufficient and efficient.

4. Calculation Algorithm : Simple formula-based calculation
- Rationale :The total price of all the products chosen by the user is the sum of all the prices of the products.

5. Error handling :
- Rationale : Basic error handling is sufficient for a small project like this and the user is expected to enter valid data.

## IMPLEMENTATION DETAILS :

1. Language : Python
2. Development environment : Spyder
3. Module : Effective Shopping Assistance
4. Function : categories(items),view_products(items), add_to_shopping_list(item,list), display_shopping_list(list), remove_from_shopping_list(list), total_price(items,list), menu_driven(), seperate_line()
5. Implementation steps :
- Implement the menu_driven() function to first show all the possible operations that can be done by the system.
- Once after it is implemented the user has to input a choice so as to proceed the program further
- Then the function that is called by the user is implemented and the result is displayed to the user.
- Test the program with sample inputs and verify the results.

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## TESTING APPROACH :

1. Unit tests :
   Manually check the system's logic using any input value so as to verify the code is free from all error
2. User flow testing :
   Ensure that an error message displays if any of the input is wrong.
3. Peer view :
   Verified among my peer group on calculations and reliability.

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## SCREENSHOTS / RESULTS :

```
Python 3.8.10 (tags/v3.8.10:3d8993a, May  3 2021, 11:48:03) [MSC v.1928 64 bit (AMD64)]
Type "copyright", "credits" or "license" for more information.

IPython 8.12.2 -- An enhanced Interactive Python.

In [1]: runfile('C:/Users/Admin/gokul/untitled10.py', wdir='C:/Users/Admin/gokul')

          MENU

Shopping Assistant
1. View Products By Categories
2. Add Item To Your Shopping List
3. View Your Shopping List
4. Remove Item From Your Shopping List
5. To Calculate The Total Price In Your Shopping List
6. Exit

Enter The Choice:1
Item categories:
1 . Fruits & Vegetables
2 . Dairy & Eggs
3 . Meat
4 . Beverages
Enter the Choice of category That the user want to view:2
```

```
Items in Dairy & Eggs ;

1 . Milk ,price: 28  ,calorie content: 150 calories
2 . Paneer ,price: 190  ,calorie content: 265 calories
3 . Eggs ,price: 30  ,calorie content: 78 calories
4 . cheese ,price: 20  ,calorie content: 110 calories

Enter The Choice:2
Item categories:
1 . Fruits & Vegetables
2 . Dairy & Eggs
3 . Meat
4 . Beverages
Choose The Category Number You Want:2
1 . Milk  , price: 28  , calorie_content: 150 calories
2 . Paneer  , price: 190  , calorie_content: 265 calories
3 . Eggs  , price: 30  , calorie_content: 78 calories
4 . cheese  , price: 20  , calorie_content: 110 calories
Enter The Item Number That You Want To Add Your In Shopping List:3
The Item Eggs Successfully Added In Your Shopping List
```

```
Enter The Choice:2
Item categories:
1 . Fruits & Vegetables
2 . Dairy & Eggs
3 . Meat
4 . Beverages
Choose The Category Number You Want:3
1 . Beef  , price: 300  , calorie_content: 170 calories
2 . Chicken  , price: 120  , calorie_content: 238 calories
3 . mutton  , price: 200  , calorie_content: 294 calories
4 . Pork  , price: 400  , calorie_content: 242 calories
Enter The Item Number That You Want To Add Your In Shopping List:3
The Item mutton Successfully Added In Your Shopping List

Enter The Choice:3
*The User's Shopping List Is*
1 . Eggs , Dairy & Eggs
2 . mutton , Meat

Enter The Choice:4
*The User's Shopping List Is*
1 . Eggs , Dairy & Eggs
2 . mutton , Meat
Enter The Item Number To Be Removed From Your Shopping List:2
The Item mutton Successfully Removed From Your Shopping List
```

```
Enter The Choice:5
The Total Price According To The Users Shopping List is: 30

Enter The Choice:6
Thank You For Using Our Shopping Assistant

In [2]:
```

```
Enter The Choice:8
!!! Invalid Choice !!!

In [2]:
```

## CHALLENGES FACED :

1. Wrong input:
   After completion of program when the user inputted a value which is incorrect the system automatically exits the program
2. Transparency :
   Providing the user with the clear step by step Calculations and not just their final results.

## LEARNING AND KEY TAKEAWAYS :

1. Implementation :
   Learned how to implement the acquired knowledge to solve the real-life problems, acquired a lot of practical skills in

shape-shifting the academics into a key for locks of problem in today's world.

2. Automation value :
   This would have taken a lot of time and energy if it was done manually but now within seconds with the help of this AI it is easy to shop efficiently.

3. Testing :
   Coding part is easy if we know the logic behind it but we can only know our code is correct when we test run it with multiple values, so I understood that testing a system is as important as designing a system.

4. Communication :
   The system's ability of guidance has been improved and error messages are directly displayed in the output UI for optimal user support.

## FUTURE ENHANCEMENTS :

1. Data persistence :
   Add support for local storage, so that the user can store his previous session data and prevent it from losing in the next session.

2. User Interface :
   Separately designing a new User Interface (App / Webpage) for better conditions and presentation and instant access of the system rather than running in Spyder

3. Export :
   Enabling exporting reports as in the form of PDF or EXCEL or Direct email share formats for the student's use.

## REFERENCE :

1. VIT BHOPAL Academic guidelines for Grading and Credit calculation.
2. VITYARTHI and CSE1021 course for Python coding skills.
3. Google for learning about Documentation.