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05/17/2025

Addressing Living Needs for Seniors in Pima County

Final project for CIS 129

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Introduction to the Low-Income Problem

The Low-Income Problem

- This final project will focus on the issues faced by low-income individuals above the age of 65 with respect to meeting living needs and expenses.

- Given Tucson's high rate of poverty, many individuals struggle to meet basic living expenses and are left without food, energy, and shelter.
    - This issue is emphasized by the large senior population in Tucson, as aging naturally exacerbates the struggle of finding work, paying for bills, and applying for programs which give support to seniors.

- As a regular volunteer at the Pima Council on Aging (PCOA) in Tucson, I have experience helping to screen low-income seniors to identify their struggles and identify solutions.

- For my program, I intend to design software that collects user input for living necessities, screens the data, and outputs resources and living assistance programs to provide aid.

Summary of Findings

The Low-Income Situation

- Historically, Tucson's median household income has remained below the national average.
  - In 1950, Tucson and the national median income were $2,373 and $2,619 respectively; in 2023, these values were $55,708 and $77,719 respectively.

- Likewise, this income appears to trend with the aging rates in Tucson, with Tucson possessing a lower median age throughout the past hundred years.
  - In 1950, Tucson and the national median age were 30.3 and 30.2 respectively; in 2023, these values were 40.1 and 39.2 respectively.

Current Solutions and Future Directions

- Current software solutions to the issue of screening low-income seniors for meeting their living needs are inadequate.
    - The only existing solutions are websites and directories with compilations of living assistance programs and resources available (such as the PCOA Resource Directory).

- These solutions do not complete the process of screening and output tailored resources for clients in need, leaving the work up to trained agents (like myself).
    - For the future, a software solution may be leveraged to complete basic screening elements for an agent, outputting specific resources and further search parameters.

- If the low-income root problems are not addressed, seniors will continue to experience the negative effects including increased disability rates, depression and anxiety rates, and early mortality.

Real-World Applications

How these Concepts Apply

- Benefits screening agents spend upwards of 30 minutes per screening session for each client, and staff count is often highly limited at such organizations.
    - This allows for about 5-7 client consultations per staff per day, given that much of the time is spent completing notes in state databases (i.e. DAARS) and reaching out to relevant institutions to secure aid.
    - The waitlist for benefits screenings is extensive, so any time saved is critical.

- Having a software solution that can auto-screen clients and suggest common aid programs would save agents a substantial amount of time.

- Furthermore, the program could be designed to output specific search parameters for agents to use when searching for client-specific programs.

- As many of the root causes of low-income and poverty among seniors in Tucson stem from fundamental socioeconomic factors, the program could also collect information on poverty indicators to help agents understand *why* clients are struggling and what a long-term solution could look like.

Software Design Approach

Program Overview

- The proposed software would request user input for their monthly income and expenditures.
- The program would yield a net income (income - expenses) and compare each expenditure to a weighted minimum (based on client income).
- The program would then give a recommendation to the client for which expenses to spend less on and where money can be saved.
- Then, the program would ask the user for information about what they are struggling with specifically (utilities, housing, energy, etc.), and based on their income and demographic information, would output potential resources and assistance programs.
- Lastly, the program would output specific search parameters regarding the client (income based, demographic based, geography based, etc.) based on the client's answers to the initial input questions.

The Design Approach

- Given that the first portion of the program requests user input, I would initialize information-carrying variables tied to the input statements (including income, expenses of each type, etc.).
- Then, I would use input operations to collect user input. Numerical information will be converted into floating point numbers.
- To determine net income, a summation operation will be used on the expenditure values into a new expenditures variable. This value will be subtracted from the income provided.
- To provide recommendations, the given income will be placed into a bracket, with each bracket given a constant multiplier. This multiplier will be applied to each expenditure minimum and, if the input expenditure goes over the recommended amount, the user will be notified to cut down spending for that category.

The Design Approach Continued

- When asking the user for their specific issue, the software will request another string input, and whether the user decides to write full sentences or short phrases is up to the user. The user input will be compared with a pre-prepared list of buzzwords containing relevant living needs terms (utilities, electric, apartment, homeless, etc.) and the program will search through the string to find which buzzwords are found. Buzzwords will be categorized based on the living expense it is attributed to (e.g. electric and energy, homeless and shelter, etc.).
    - If no buzzwords are found, the program will re-request input and ask the user to be more specific; if one or more buzzwords are found, the program will output a list of the most commonly used resources by agents for that expense type(s).

- Lastly, given the user's initial input, the program will notify the agent of specific search parameters for the client so more targeted help can be given. Many clients will be taken care of simply with the program since about 20% of the provided resources by most organizations assist with 80% of clients.
    - Specific parameters can help agents determine the specific types of aid client's are eligible for and the paperwork needed to attain said aid (e.g. whether or not a 201 form would be needed for Section 8 in collecting property tax credit).

Solution Design Proposal

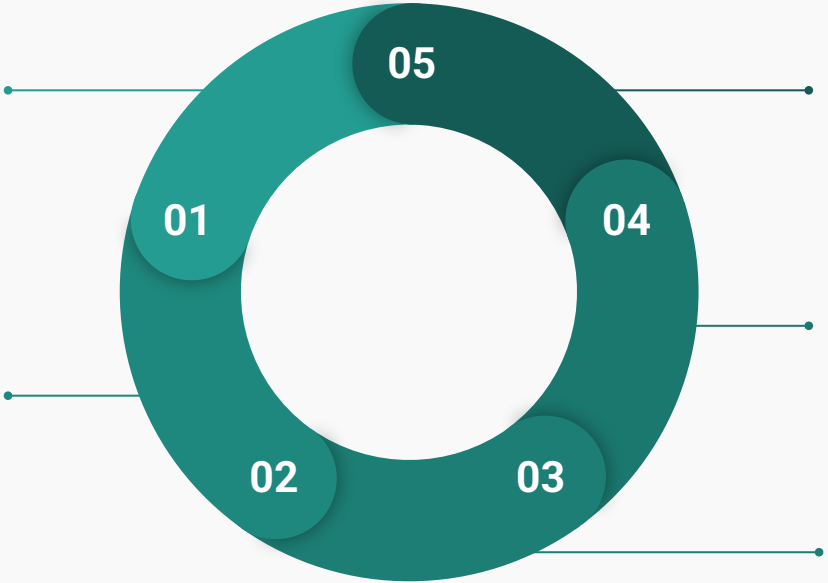
Design Proposal (Diagram)

Initialize Variables, Define Resources, and Collect Input

Set up variables and ask the user for income, expenses, and demographic info. Convert numbers to float values for calculations.

Calculate Net Income and Apply Income Bracket

Subtract total expenses from income to get net income. Use income level to assign a multiplier for recommended spending limits.



Generate Tailored Resources and Search Parameters

Show relevant support programs based on user needs. Print tailored search filters using income and demographics.

Identity Individual Struggles

Ask the user what they're struggling with and check for keywords. Match found terms to resource categories.

Recommend Spending Adjustments

Compare each expense to its recommended limit. Notify the user if spending is too high in any category.

Design Proposal (Pseudocode)

```
# Initialize variables
monthly_income=0
expenses=0 #there would be one variable for each expense
net_income=0
buzzwords=[electric, energy, item3 ...]
resource_categories={'electric': power, 'energy': power, 'homeless': housing, ...}
found_buzzwords=[empty] # buzzwords will be keys in resource_categories and categories will be values
resources_reccomended=[empty]
category1=[list of resources]

#Collect user input
monthly_income=float(input(___))
expenses=float(input(e.g. 'Gas expenses: '))
demographic1=str(input(e.g. 'Do you own your residence?: '))

#Income bracket and weighted minimum expenses
if monthly_income < 2000:
        multiplier=0.65
elif 2000 < monthly_income < 3000:
        multiplier=0.85
elif etc.
```

Pseudocode Continued

```
#Calculations
net_income=monthly income - sum(expenses)
print(f'{net_income}')

#Recommendations
if expense1 > minimum*multiplier:
        print('Spending for expense1 should be reduced to no more than:' minimum*multiplier)

#User-identified issue and buzzwords search
issue=input(___)
for word in issue:
        if word is in buzzwords:
                append found_buzzwords
if found_buzzwords=empty:
        print('Please be more specific.')
        str(input('What is your struggle: ')
else:
        for each buzzword (key) in found_buzzwords:
                get category (value) from resource_categories
                append category to resources_reccommended
```

Pseudocode Continued

```
for each category in resources_reccommended:
        display category
        print(f'{category}') #prints list of recommended resources

#Identify and print search parameters
print(f'Client specific: {demographic1}, {demographic2}...')
```

- Reflection: the program differs from other software alternatives as it pre-screens clients and gives recommendations automatically. There are many instances for client's to interact as they are encouraged to input relevant information as well as share their thoughts in text passages which are scanned by the program. The program can be completed by an agent on behalf of a client, or be included on an organization's website for clients to use for themselves, saving agents time to focus on more acute clients.

Open Questions

The Questions that Remain

- It is unknown what the most effective long term solutions are for helping individuals and families break from the cycle of poverty. While education and meaningful work experiences provide a strong foundation, oppressive elements continue to exist within society and the afflicted psychology of many low-income individuals persists in being a challenge to organizations seeking to provide development for such people.

- I wonder if it is possible for wealth inequalities to be eradicated, leaving no reason for low-income assistance. In the real world, rising incomes in the aggregate would still leave behind a wealth gap, despite those in lower-income backgrounds no longer existing in poverty.

Thank You for Your Time!

Citations

- “Tucson Then and Now: What Has Changed over 75 Years.” *Arizonas Economy*, 15 Nov. 2024, www.azeconomy.org/2024/11/demographics-census/tucson-then-and-now-what-has-changed-over-75-years/.

- “Resource Directory.” *Pima Council on Aging*, 17 Apr. 2025, pcoa.org/ways-we-help/directory/?cat_id=26&cpage=21.

- “Ojin Homepage.” *OJIN*, ojin.nursingworld.org/table-of-contents/volume-29-2024/number-1-january-2024/poverty-in-older-adulthood/#:~:text=Older%20adults%20who%20live%20in,cognitive%20decline%2C%20and%20early%20mortality. Accessed 17 May 2025.

- Interview with Cheryl Richards at the Pima Council on Aging