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Notebook:	Computers and Programming I		
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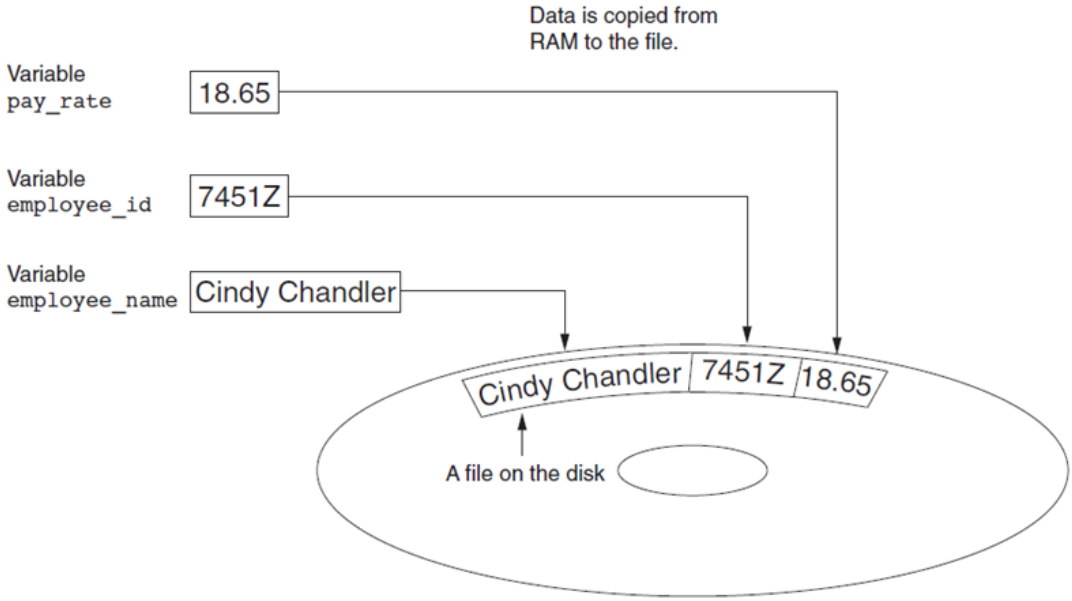
- For program to retain data between the times it is, you must save the data
  - Data is saved to a file, typically on a computer disk
  - Saved data can be retrieved and used at a later time
- Programmers usually refer to the process of saving data in a file "Writing data to a file". When a peice of data is written to a file, it is copied from a variable in RAM to the file.
- THe term output file is used to describe a file that data is written to. It is called an Output file because the program stores output in it.

Figure 6-1 Writing data to a file



- Reading data from:
  - The process of retrieving data from a file known as reading data from files. When a piece of data is read from a file, it is copied from the file into RAM and reference by a variable.
- Input File:
  - The term input file is used to describe a file from which data is stored.
- There are always three steps that must be taken when a file is used by a program:
  - Open the file
    - opening a a file creates a connection between the file and the program.
  - Process the file
    - data is either written to the file or read from the file
  - Close the file
    - when the program is finished using the file, the file must be closed. Closing a file disconnects it from the program.
- Two Types of File:
  - Text File:
    - contains data that has been encoded as text using a scheme such as a ASCII or Unicode
    - Binary File
      - contains data that has not been converted to text. The data that is stored in a binary file is intended only for a program to read.
- Ways To Access Data Stores In File
  - Sequential Access
    - file read sequentially from beginning to end, can't skip ahead
  - Direct Access (Random Access

        - Can jump directly to any piece of data in a file
- File Name Extensions:
    - Short sequences of characters that appear at the end of a filename preceded by a perios
- File Object
    - Object associated with a specific file and provides a way for the program to work with that file
- Opening a file:
    - my_file = open ("test.txt", "w")
- Mode
    - String specifying how the file will be opened
        - r is for reading only
        - w is for writing only
            - this option will delete all prior data
        - a is for editing
- If open function receives a filename that does not contain a path, assumes the file name is in the same directory of the path
- If program is running and file is created, it is created in the same directory as the program
- Writing Data To A File
    - Method:
        - a function that belongs to an object
        - Performs operation using object.
            - my_file = open ("test.txt", "w")
            - my_file. write ('Hello')
        - Files should be closed using file object close to method:
            - my_file. close ( )
- Read Method
    - File object method that reads entire file contents into memory
        - Only work if the file has been opened for reading

- Readline Method
    - file object method that reads a line from a file
- Read position:
    - marks the location of the next item to be read from a file.
- Concatenating
    - "Hello" + "World" = Hello World
    - rstrip
        - removes characters at the end
- Numbers must be converted to stings before they are written to a file
- str function:
    - converts value to string
- Numbers are read from a text file as strings
    - Must be converted to numeric type in order to perform mathematical operations
    - Use int and float functions to convert string to numeric value
- Files typically used to hold largr amounts of data and programs typically use a loop to process the data in a file
    - Loop typically involved in reading from and writing a files
- Often the number of items stored in file is unknown
    - The readline method used an empty string as a sentinel when end of file is reached.
    - Can write a while loop with the condition
        - while line ! = ' '