

Al Akhawayn University in Ifrane

School of Science and Engineering

CSC2302 Project 2

Spring 2024

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This is your first CSC2302 project that counts 5% of your overall grade.

☛ You need to submit your project on **Tuesday May 7<sup>th</sup>** before midnight.

- 1 group member will have to upload the .c file via Canvas.

- Name your file as follow:

StudentName1\_StudentName2\_Project2.c

- You will lose two points for not naming the file properly.

- You have a 1-time submission, and the system will close at 00:00. Please note that files sent via email, or any other means will not be accepted.

☛ Assume responsibility for the work you will submit.

- Any form of plagiarism will imply a WF as course grade.

☛ **Assessed ILO:** design, implement and test a priority queue implemented using a **maximum heap**.

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**Refer to the following dictionary definition:** an auction is a sale of property to the highest bidder. Da Vinci's Salvator Mundi sold at a 2017 auction for nearly half a billion dollars!

An auctioneer is saying: "I got a commission bid on a fine artwork". That means some people who are unable to attend the auction have completed a commission bidding forms and entered a maximum price that they can pay for the art work.

I am providing you with a file that has some offers made by some bidders.  
**Do not change the format of the file.**

You will have to use a heap of size 10 and you will use 1 structure which consists of 3 elements: bidder ID, bidder name and bidder offer. The last element must be a numerical variable. Two bidders can have the same name but not the same ID!

1. We will use the following menu to manage the auction

1. Start the auction
2. A new offer from a new bidder
3. Update my offer!
4. View list of offers
5. Retract my bid
6. End the auction

### **Important Points to consider:**

- Including printing the menu, each menu function must be implemented using a user defined function.
  - o Functions should be designed properly.
  - o Input and output arguments should be considered carefully.
- Options 2 to 6 should not be executed until the auction has started.
- Option 1: is meant to put the commission bidders into the heap.
  - o You can use multiple functions here!
  - o Make sure that you print the content of your maximum heap.
- Option 2: is meant to allow a new bidder to join the heap. Make sure that you generate the right ID.
  - o You can use a global variable that we will set to 5.
  - o Your main function **should print the status of adding: successful or not!**
- Option 3: An existing bidder, probably, wants to make a new offer. This offer must be greater than the initial one!
  - o Error handling should be your duties as a programmer!
- Option 4: auction manager wants to view the list of offers he/she got so far in a descending order!
  - o Use heap sort.

- Option 5: a bidder, who may or may not exist, decided to withdraw his/her bid!
  - o Main should print the right message.
- Auction is over and winner's name should be announced!
  - o Don't forget to print the offer in dollars.
    - Make sure that you use the same format adopted in the file!

**Important points to consider:**

- You will have to use only one global variable as mentioned up.
- Only one structure should be used.
- Errors handling and displaying the right messages in the main function are your duties as a programmer.

Good Luck,