

'The Age of Oscar Winners' Investigation

A note to teachers:

This activity uses a very topical dataset typically of interest to students. The investigation is written within an open-ended context. For this reason it is best that students are familiar with using the graphic calculator to generate statistics and draw graphs prior to tackling this activity.

You may wish to add detailed student guidelines in regard to the presentation of their findings.

The solutions included with this investigation are not instructional. If you are new to the STAT mode of the Casio 9860 then the document 'Self-Guided_9860_STAT' will be beneficial. This can be found at www.casioed.net.au

NOTE: If you desire to modify this activity and therefore desire the original word document you may request it by emailing casio.edusupport@shiro.com.au.

The Age of Oscar Winners

Below is the data 'Age of Oscar Winners'. This is a list of all male and female Oscar winners and their respective ages between 1928 and 2007 inclusive.

Your task is to investigate/analyze the data and present your findings on paper. Give some possible reasons for your findings.

Suggestions of possible investigations:

- Do female Oscar winners tend to be older or younger than male Oscar winners?
- Has there been a trend for the age of females, at the time of winning an Oscar, to be increasing or decreasing since 1928?
- Has there been a trend for the age of males, at the time of winning an Oscar, to be increasing or decreasing since 1928?



Age of Oscar Winners

<http://www.britannica.com/oscar>

M A L E S				F E M A L E S			
Year	Age	Name	Film		Age	Name	Film
1928	44	Emil Jannings	The Last Command		22	Laura Gainor	Sunrise
1929	38	Warner Baxter	In Old Arizona		37	Mary Pickford	Coquette
1930	62	George Arliss	Disraeli		30	Norma Shearer	The Divorcee
1931	53	Lionel Barrymore	A Free Soul		62	Marie Dressler	Min and Bill
1932	47	Wallace Beery	The Champ		32	Helen Hayes	Sin of Madelon Claudet
1933	34	Charles Laughton	Private Life Henry VIII		26	Katherine Hepburn	Morning Glory
1934	33	Clarke Gable	It Happened One Night		31	Collette Colbert	It Happened One Night
1935	49	Victor McLagen	The Informer		27	Bette Davis	Dangerous
1936	41	Paul Muni	Story of Louis Pasteur		26	Luise Rainer	The Great Zeigfield
1937	37	Spencer Tracy	Captains Courageous		27	Luise Rainer	The Good Earth
1938	38	Spencer Tracy	Boys Town		30	Bette Davis	Jezebel
1939	34	Robert Donat	Goodbye, Mr. Chips		26	Vivien Leigh	Gone With The Wind
1940	32	James Sterart	Philadelphia Story		29	Ginger Rogers	Kitty Foyle
1941	40	Gary Cooper	Sergeant York		24	Joan Fontane	Suspicion
1942	43	James Cagney	Yankee Doodle Dandy		39	Greer Garson	Mrs Miniver
1943	48	Paul Lukas	Watch on the Rhine		24	Jennifer Jones	The Song of Bernadette
1944	41	Bing Crosby	Going My Way		29	Ingrid Bergman	Gaslight
1945	38	Ray Milland	The Lost Weekend		37	Joan Crawford	Mildred Pierce
1946	49	Fredric March	Best Years of Our Lives		30	Olivia de Havilland	To Each His Own
1947	56	Ronald Coleman	A Double Life		34	Loretta Young	The Farmer's Daughter
1948	41	Laurence Olivier	Hamlet		34	Jane Wyman	Johnny Belinda
1949	38	Broderick Crawford	All the King's Men		33	Olivia de Havilland	The Heiress
1950	38	Jose Ferrer	Cyrano Bergerac		28	Judy Holliday	Born Yesterday
1951	52	Humphrey Bogart	The African Queen		38	Vivien Leigh	A Streetcar Named Desire
1952	51	Gary Cooper	High Noon		45	Shirley Booth	Com Back, Little Sheba

Graphic Calculator data activity Casio 9860

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This activity was adapted by Richard Andrew from the 'Oscar Winners' activity, Exploring Data website: <http://exploringdata.cqu.edu.au/>
 Additional Oscar's data was sourced from <http://www.britannica.com/oscar>

Year	Age	Name	Film		Age	Name	Film
1953	35	William Holden	Stalag 17		24	Audrey Hepburn	Roman Holiday
1954	30	Marlon Brando	On The Waterfront		26	Grace Kelly	The Country Girl
1955	38	Ernest Borgnine	Marty		47	Anna Magnani	The Rose Tattoo
1956	36	Yul Brenner	The King And I		41	Ingrid Bergman	Anastasia
1957	43	Alec Guinness	Bridge on River Kwai		27	Joanne Woodward	Three Faces of Eve
1958	48	David Niven	Separate Tables		39	Susan Hayward	I Want To Live!
1959	35	Charlton Heston	Ben-Hur		38	Simone Signoret	Room at the Top
1960	47	Burt Lancaster	Elmer Gantry		28	Elizabeth Taylor	Butterfield 8
1961	31	Maximilian Schell	Judgment at Nuremberg		27	Sophia Loren	Two Women
1962	46	Gregory Peck	To Kill a Mockingbird		31	Anne Bancroft	The Miracle Worker
1963	39	Sidney Pointier	Lilies of the Field		37	Patricia Neal	Hud
1964	56	Rex Harrison	My Fair Lady		30	Julie Andrews	Mary Poppins
1965	41	Lee Marvin	Act Ballou		24	Julie Christie	Darling
1966	44	Paul Scofield	A Man For All Seasons		34	Elizabeth Taylor	Who's Afraid of Virginia Woolf?
1967	42	Rod Steiger	In the Heat of The Night		60	Katherine Hepburn	Guess Who's Coming To Dinner
1968	43	Cliff Robertson	Charly		44*	K Hepburn(61)*/B Streis(26)*	The Lion In Winter / Funny Girl
1969	62	John Wayne	True Grit		35	Maggie Smith	The Prime of Miss Jean Brodie
1970	43	George C Scott	Patton		34	Glenda Jackson	Women in Love
1971	40	Gene Hackman	The French Connection		34	Jane Fonda	Klute
1972	48	Marlon Brando	The Godfather		26	Liza Minnelli	Cabaret
1973	48	Jack Lemmon	Save The Tiger		37	Glenda Jackson	A Touch of Class
1974	56	Art Carney	Harry and Tonto		42	Ellen Burstyn	Alice Doesn't Live Here Anymore
1975	38	Jack Nicholson	Cuckoo's Nest		41	Louise Fletcher	Cuckoo's Nest
1976	60	Peter Finch	Network		35	Faye Dunaway	Network
1977	30	Richard Dreyfuss	The Goodbye Girl		31	Diane Keaton	Annie Hall
1978	40	Jon Voight	Coming Home		41	Jane Fonda	Coming Home
1979	42	Dustin Hoffman	Kramer vs. Kramer		33	Sally Field	Norma Rae
Year	Age	Name	Film		Age	Name	Film
1980	37	Robert De Niro	Raging Bull		30	Sissy Spacek	Coal Miner's Daughter
1981	76	Henry Fonda	On Golden Pond		74	Katherine Hepburn	On Golden Pond

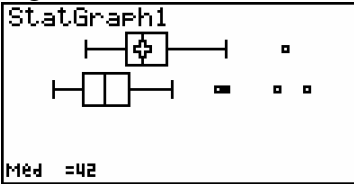
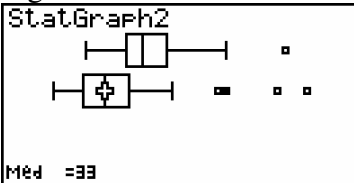
Graphic Calculator data activity Casio 9860

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Year	Age	Name	Film		Age	Name	Film
1982	39	Ben Kingsly	Gandhi		33	Meryl Streep	Sophie's Choice
1983	52	Robert Duvall	Tender Mercies		49	Shirley MacLaine	Terms of Endearment
1984	45	F. Murray Abraham	Amadeus		38	Sally Field	Places in the Heart
1985	35	William Hurt	Kiss of the Spider		61	Geraldine Page	Trip to Bountiful
1986	61	Paul Newman	The Colour of Money		21	Marlee Matlin	Children of a Lesser God
1987	43	Michael Douglas	Wall Street		41	Cher	Moonstruck
1988	51	Dustin Hoffman	Rain Man		26	Jodie Foster	The Accused
1989	32	Daniel Day-Lewis	My Left Foot		81	Jessica Tandy	Driving Miss Daisy
1990	42	Jeremy Irons	Reversal of Fortune		42	Kathy Bates	Misery
1991	54	Anthony Hopkins	Silence of the Lambs		29	Jodie Foster	The Silence of the Lambs
1992	52	Al Pacino	Scent of a Woman		33	Emma Thompson	Howards End
1993	37	Tom Hanks	Philadelphia		35	Holly Hunter	The Piano
1994	38	Tom Hanks	Forrest Gump		45	Jessica Lang	Blue Sky
1995	31	Nicolas Cage	Leaving Las Vegas		49	Susan Sarandon	Dead Man Walking
1996	45	Geoffry Rush	Shine		39	Frances McDormand	Fargo
1997	60	Jack Nicholson	As Good As It Gets		32	Helen Hunt	As Good As It Gets
1998	46	Robert Benigni	Life is Beautiful		26	Gwyneth Paltrow	Shakespeare In Love
1999	40	Kevin Spacey	American Beauty		25	Hillary Swank	Boys Don't Cry
2000	36	Russel Crowe	Galdiator		33	Julia Roberts	Erin Brockovich
2001	47	Denzel Washington	Training Day		35	Helle Berry	Monster's Ball
2002	29	Adrien Brody	The Pianist		35	Nicole Kidman	The Hours
2003	43	Sean Penn	Mystic River		28	Charlize Theron	Monster
2004	37	Jamie Foxx	Ray		30	Hillary Swank	Million Dollar Baby
2005	38	Philip Seymour Hoffman	Capote		29	Reese Witherspoon	Walk The Line
2006	45	Forest Whitaker	Last King of Scotland		61	Helen Mirren	The Queen
2007	51	Daniel Day-Lewis	There Will Be Blood		33	Marion Cotillard	La Vie en Rose

NOTE*: In 1968 a tie occurred for the female Oscar. 44 is the mean of the 2 winner's ages

Age of Oscar Winners – Screenshot Solutions

	Screenshots
<p>NOTE: For detailed instructions on finding statistics and drawing graphs refer to the document 'Self-Guided_9860_STAT' which can be found at www.casioed.net.au</p> <p>Investigation One: Do female Oscar winners tend to be older or younger than male Oscar winners?</p> <p>Firstly, by simply casting one's eye over the data it appears that the male Oscar winners tend to be older than the female winners.</p> <p>By calculating the means we can see the average age of a male Oscar winner is 43.5 (Fig1) and of a female Oscar winner, 35.5 (Fig2) It therefore appears conclusive that male Oscar winners tend to be older than their female counterparts (2VAR option used for Figs1&2)</p> <p>By comparing the box plots we see that the median age for males is 42 (Fig3) and for females is 33 (Fig4). In addition the middle 50% of ages for the males is approximately 10 years older than for the females (male IQR is 9yrs stretching from 28 to 39 compared to the female IQR of 10 stretching from 28 to 39). These reasons add to the conclusion that male Oscar winners tend to be older than female Oscar winners.</p> <p>It is interesting that the IQRs for each are almost identical, as is the shape of the box plots (ignoring outliers), the male box plot having been shifted 'up' approx 10 years.</p>	<p>Fig1</p> <pre> 2-Variable y =43.5 Σx =3480 Σx² =157560 x̄n =8.78919791 x̄n-1 =8.84465081 n =80 ↓ </pre> <p>Fig2</p> <pre> 2-Variable y =35.4875 Σy =2839 Σy² =110531 ȳn =11.0577956 ȳn-1 =11.1275615 Σxy =124342 ↓ </pre> <p>Fig3</p>  <p>Fig4</p> 

Investigation Two: Has there been a trend for the age of females, at the time of winning an Oscar, to be increasing or decreasing since 1928?

We could investigate this using a scatter plot with 'Years' as the X axis and 'Age' as the Y axis. Fig 5 shows the organization of the data.

Fig6 shows the scatter plot. There appears to be little in the way of a trend or correlation in the data.

By selecting the linear regression model (CALC (F1) then X (F2)) (Fig7) we can see that the correlating coefficient is 0.22. Again, this indicates a negligible relationship between the year and the female Oscar winner's age.

By drawing the linear regression we see that the model does increase slightly over time showing an 'average age' of 31 at 1928 (Fig8) increasing to 40 by 2010 (Fig9).

However, bearing in mind the correlating coefficient of 0.22 the most we could conclude is that it appears there 'might' be a slight trend for female Oscar winners to be getting older over time. However statistically this is inconclusive. It will be interesting to observe the trend over the next 100 years!

Fig5

SUB	YEAR	MALE	F-MAL
1	28	44	22
2	29	38	37
3	30	62	30
4	31	53	62

28
[GFH1] [GFH2] [GFH3] [SEL] [SET]

Fig6

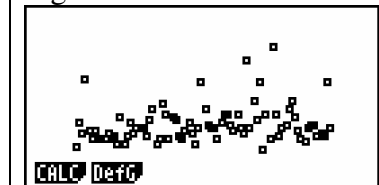
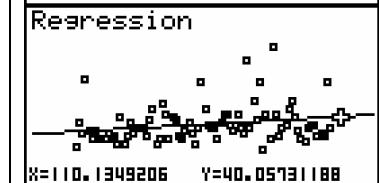
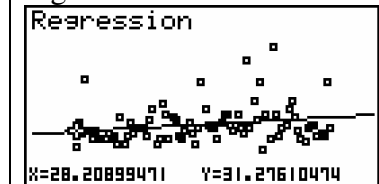


Fig7

LinearRes
a = 0.10718471
b = 28.2525316
r = 0.22383589
r² = 0.0501025
MSe = 119.126735
y = ax + b
[COPY] [DRAW]

Fig8



Another way we could investigate the possibility of an age trend in female Oscar winners over time is to split the data into several groups. Fig9 shows that, in the emulator generating these screenshots, the data has been organized into 3 sections: 1928 – 1953 (lists 5–7), 1954 – 1980 (lists 8–10), 1981 – 2007 (lists 11-13).

Fig9

	List 5	List 6	List 7	List 8
SUB	YEAR1	MALE	F-MAL	YEAR2
1	28	44	22	54
2	29	38	37	55
3	30	62	30	56
4	31	53	62	57
				54
	GFH1	GFH2	GFH3	SEL
				SET

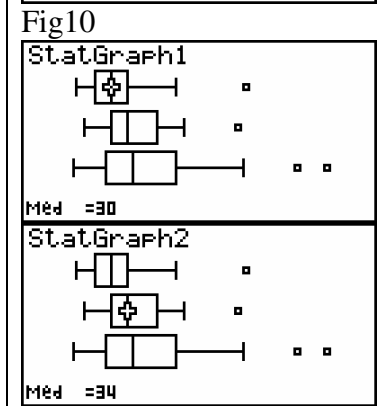
	List 8	List 9	List 10	List 11
SUB	YEAR2	MALE	F-MAL	YEAR3
1	54	30	26	81
2	55	38	47	82
3	56	36	41	83
4	57	43	27	84
				81
	GFH1	GFH2	GFH3	SEL
				SET

	List 11	List 12	List 13	List 14
SUB	YEAR3	MALE	F-MAL	
1	81	76	74	
2	82	39	33	
3	83	52	49	
4	84	45	38	
	GFH1	GFH2	GFH3	SEL
				SET

This then enables three box plots to be drawn, 1 for each year grouping.

Fig10 shows the median female Oscar-winner age of the first year grouping to be 30 and the second grouping, 34. The third median is 35.

The closeness of the medians supports the previous conclusion that there is little in the way of a conclusive statistical argument that the age of female Oscar winners is changing over time.



Investigation Three: Has there been a trend for the age of males, at the time of winning an Oscar, to be increasing or decreasing since 1928?

The data for the men suggests quite conclusively that there is no trend of age change over time. Fig11 shows the correlating coefficient of the linear regression model to be nearly zero (0.06)

The model can be seen in Fig12.

When we draw the box plots of the 3 year groupings we see that the three medians are 41, 42 and 43 (Fig13), a statistically insignificant result.

